The National Maternity Hospital
ANNUAL REPORT 2021

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Holles Street

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This Annual Report should be read in conjunction with the Annual Financial Statements which provide certain additional information required under the Code of Practice for the Governance of State Bodies Business and Financial Reporting Requirements purposes.

Front cover image: Kellie Fennell with one of her twin daughters, Holly, born in The National Maternity Hospital in 2021. (Photo credit: Amanda Hatton Photography)

The NMH Mission and Vision Statements

Mission

As the leading Maternity Hospital in Ireland and a national referral centre for complicated pregnancies, premature and sick babies, our mission is to ensure our patients receive high quality, safe, evidence based care whilst respecting their dignity and rights. This will be achieved through fostering excellence and innovation in patient care, training, education and research, in a culture of quality and safety where each person is valued, respected and facilitated for personal and professional growth.

Vision

To be renowned as a world class hospital for the care of women and babies.

Births:
7,694

Babies:
7,855

Outpatient Attendances:
93,064

Food Safety Assurance Award:
99.5%

Ultrasound Scans:
35,111

Emergency Room Attendances:
11,442

Radiology exams:
8,327

Specimens received:
199,910

Staff:
930

Beds:
194

Breastfeeding Rate:
72%

Medications dispensed:
26,779

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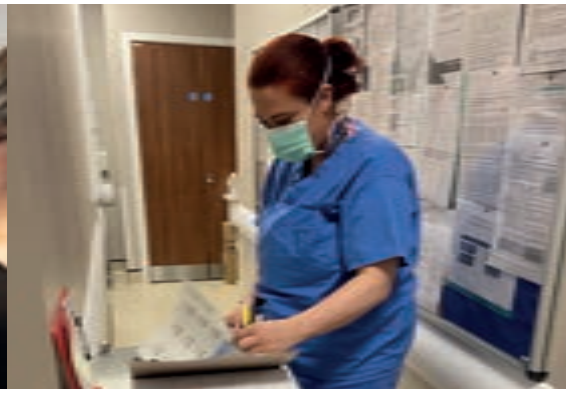


Deputy Chairman's Report

The months have flown by since I became Deputy Chairman of the NMH last July. I have enjoyed every minute of it. The NMH is a wonderful place with really great people. It has a fantastic culture and this is evident everywhere. The senior team led by the Master, Shane Higgins and supported by the Director of Midwifery & Nursing, Mary Brosnan and the General Manager, Ronan Gavin maintain this culture right throughout the hospital. Despite the fact that the Hospital struggles with its infrastructure, patient care is truly excellent. I am so proud to be a part of this.

I would like to say a big thank you to the Executive Committee (Board) for their support and challenge. All those who chair and serve on the many committees do a fantastic job on behalf of the Hospital.

Many organisations talk about the importance of their people. At the NMH this is especially true. We are privileged to have such wonderful teams of people in every area of the Hospital, all playing a vital part in providing the wonderful patient care we are renowned for.

During 2021 the Hospital, like the rest of society, continued to endure the COVID pandemic. As for everyone this continued to be a challenging period for many reasons, including the uncertainty around when the entire world would return to "normal". In January the Hospital, along with many other hospitals, received batches of vaccinations for administering to health care workers. A multi-disciplinary team consisting of staff from many areas was quickly formed and over the course of 3 days in January administered over 1200 individual vaccines to NMH staff and staff from other hospitals. This was an amazing achievement and we were the envy of many other hospitals. During this time our Head Pharmacist, David Fitzgerald, appeared on the Late Late Show as part of the national vaccine rollout. By mid-year a significant proportion of the population nationwide had been vaccinated but all hospitals continued to be vigilant and implement the necessary infection control procedures and restrictions. The ongoing resources for daily swabbing and testing of staff and patients required a number of individuals and this is a long term resourcing requirement.

Pat McCann, Deputy Chairman with Prof Shane Higgins, Master, in the background at The NMH Research and Innovation Symposium.

The required vigilance led to certain difficulties at times. Although general hospitals continue to refuse any visitors there was ongoing pressure on maternity units to allow partners onsite. Throughout the pandemic, NMH had continued to allow partners to attend labour but, in spite of the fact that visitors were completely banned from other hospitals, there was pressure to further ease the already limited restrictions.

The COVID pandemic highlighted how NMH can quickly adapt and overcome external challenges and clearly, once again, demonstrated the flexibility and dedication of our staff. However, the pandemic also clearly again highlighted the ongoing deficiencies of the current site in relation to infrastructure and space. In autumn 2020, we assessed the ongoing resources to deal with COVID on the current site in terms of infrastructure. These requirements were considered in the context of the planned co-location to SVUH and the fact that this remained at least 7+ years from completion. In discussions with HSE/NWIHP/IEHG it was considered that certain of the many other urgent onsite issues should also be factored into the ongoing infrastructural requirements plans to deal with COVID over the medium term. In early 2021, a Stage 2A design and report was submitted to HSE to provide for certain additional space in a modular build on an interim basis. The Executive Committee are very aware of the requirement to co-locate to Elm Park which has been planned since 2013 but they are also aware that, in the years it will take to complete, many thousands of patients require services on the current site.

During the year the other interim projects, Labour Ward and Theatre, initiated by the Executive Committee continued. The Labour Ward was completed and was operational by year end and now provides us with four modern delivery rooms which will be of benefit in the intervening years before we co-locate to Elm Park. Works on the Theatre continued to year-end and we anticipate that early in 2022 we should have three reasonably functional theatres. Both of these projects while not meeting our long term needs or being fully compliant with modern standards will nonetheless provide a better environment for patients and staff for the years before we co-locate.

The Operational Readiness element of the project to co-locate to Elm Park was in abeyance for most of the year while the focus continued on the discussions and media interest around the legal framework. Much of the time and effort of all parties involved was spent clarifying issues which had been fundamentally resolved but which were now being misunderstood or perhaps misrepresented in the public arena. On a number of occasions there were significant discussions and amendments to legal clauses agreed by all parties to ensure the Project remained on track and in line with Mulvey.

During this time, the Business Case was moving though the various processes and committees within the HSE and eventually to the HSE Board who submitted and recommended it to the Department of Health at year end. Whilst most of the Operational Readiness team were stood down, the ICT team continues their work. Dr Jenney Walsh presented at the HSE Audit and Risk Committee in relation to the Business Case and the urgent need for the new co-located facility.

Another significant issue for the Hospital and the entire health system during 2021 was the cyber-attack. The NMH onsite systems were not directly affected by this attack due to our onsite security systems. However, the NMH like many other hospitals, utilise a number of national systems that are housed centrally by HSE and we suffered due to these systems being offline and unavailable for a number of weeks. The main issue was in relation to the MN-CMS (Maternal and New-born Clinical Management System) which is the primary data source for our clinical activity. There was no access to update patient records. It was a number of weeks for the central systems to be brought back online and the back load of the records for the downtime period took many months. This highlights the need for ongoing vigilance and investment in systems and security as we may not be so fortunate in the future. The denial of access to central systems and data is still a very significant issue and appropriate national systems need to be in place. When the systems that we have implemented onsite can and have successfully secured our own onsite systems and data, we need assurances that secure access will also be available to other vital patient data that is stored in off-site national systems.

In my initial few months I have been reviewing overall governance, committees and membership and have met with various members of the Executive Committee to seek their views. This process is ongoing and will hopefully come to fruition early in 2022.

Governance and compliance are constantly evolving areas and the Hospital's work in these areas continues. As well as the ongoing governance work mentioned above, we continue to review and improve our processes and strong focus has been on the area of procurement with additional resources allocated, although COVID has somewhat delayed our programs. In addition, we continue to engage with independent external auditors for internal audit and every year there are at least four Internal Audits.

The Hospital is proud that our Laboratory and the Environmental Department attain and continue to retain accreditations to the highest of national and international standards. In addition, the Catering Team continue to impress with numerous awards. They achieved 99.5% in the FSPA (Food Safety Professional Association) awards; retained accreditation of the ISO 22,000: 2018 – Food Safety Management Systems; awarded the Irish Heart Foundation – Silver Medal Award (for healthy catering practices and promoting a range of healthy choices) and were finalists in the Irish Hotel and Catering Gold Medal awards in two categories – Best Team and Healthcare Caterer. Congratulations to all staff in these areas for their efforts.

Congratulations also to Prof Fionnuala McAuliffe who won an international award at the 2021 FIGO Women's Awards: Recognising Female Obstetricians and Gynaecologists. The Awards recognise those women who, throughout their careers, have promoted better health care for women, mothers and their children. This is a very special award and an incredible achievement by Fionnuala in recognition of her outstanding contribution to the health of women, mothers and children.

Prof John Murphy was awarded the Dr Kathleen Lynn Medal for his exceptional service on behalf of children. The Faculty of Paediatrics, in agreement with RCPI President and RCPI Council, established the Kathleen Lynn Medal in 2018 to be awarded by the Faculty for exceptional service on behalf of children. It is the highest award in Ireland to recognise paediatricians that have been outstanding in their careers and in their contribution to paediatrics. I would like to extend my warmest congratulations to Prof Murphy.

During the year Marie Culliton, Laboratory Manager, was appointed by the Minister for Health to the Board of the Medical Council as CORU representative. I wish Marie every success in her role.

Mary Brosnan, Director of Midwifery and Nursing (left) and Pat McCann, Deputy Chairman (right), with Hospital Gold Medal recipient Ella Connaughton (Higher Diploma in Midwifery).

The Linen Guild met remotely during 2021 due to the COVID-19 pandemic. The Linen Guild provide invaluable support to many of the Hospital's vulnerable patients by providing a discretionary fund. The benefit of their work cannot be over emphasised and the Hospital and patients are very grateful for their continued hard work and commitment.

I wish to thank my predecessor, Nicholas Kearns, who retired in July after 6 years. Nicholas has made my job much easier. He successfully brought the NMH through the Mulvey process and the co-location project to the stage where Mulvey has been committed into legal documents and frameworks so that the work of building the hospital can commence.

I also wish to thank Ms Christine Moran who left us in November after four and a half years. Christine played a vital role in recent years and was a member of a number of committees including the Finance, the QRPS & the Audit Committees. In addition, she did much vital work in bringing our overall Executive and Committee governance up to date.

Pat McCann
Deputy Chairman

Master's Report

Prof Shane Higgins, Master.

It is my great privilege as Master of The National Maternity Hospital to introduce this year's combined Corporate and Clinical Reports.

My sincere thanks to Mr Nicholas Kearns, Deputy Chair, Ms Michele Connolly, Honorary Treasurer, Mr William Johnston, Honorary Secretary and all members of The Executive Committee (The Board) for giving so freely of their time, expertise, knowledge and advice during the year. I welcome the opportunity to thank Mr Nicholas Kearns who retired as Deputy Chair in July. I wish to personally thank Nicholas for his unwavering support, advice and counsel both prior to and since commencing as Master. Nicholas' support and determination to oversee the various elements of the Hospital co-location at the Elm Park Campus has in no small way, ensured the success of the project to date, whilst also ensuring the continued smooth running of The National Maternity Hospital (NMH) at its current location despite the infrastructural limitations of the site.

I wish to welcome and congratulate Mr Pat McCann on his appointment as Deputy Chair of The Board. Pat has settled into the role with ease and is now fully abreast of the issues facing the Hospital.

I owe an enormous debt of gratitude to the Executive Management Team (EMT) of Ms Mary Brosnan, Director of Midwifery and Nursing, Mr Ronan Gavin, Secretary General Manager, Dr Roger McMorrow, Clinical Director and Mr Alistair Holland, Financial Controller for their continued support and commitment to the Hospital during another extraordinary year. As expected, the 1,100 staff continue to go above and beyond what is expected of them in the face of the growing challenges related

to the COVID-19 pandemic. On behalf of myself, the EMT and The Executive Committee, I wish to thank all staff for remaining true to the Holles Street ethos.

All staff who worked at the Hospital through the COVID-19 pandemic were awarded an exclusively designed Commemorative Medal in recognition of their vital work in March 2021. The medal is a symbol of gratitude for all staff who have helped keep the hospital's patients and each other safe through COVID-19.

The National Maternity Hospital has been in operation at Holles Street since 1894. It remains an independent voluntary organisation operating under a Charter with a Board of Governors and the Master responsible for clinical and operational management. It remains one of Europe's largest maternity hospitals with 146 inpatient beds. As a leading provider of maternity, gynaecological, neonatology and reproductive care, our team is dedicated to creating an institution where women and their families receive the highest standard of care. The Hospital's Neonatal Intensive Care Unit (NICU) is recognised as a national referral centre for complicated pregnancies, premature babies and sick infants. Our gynaecology unit treats over 10,000 outpatients annually. One of the hospital's main sub-specialities is the treatment of gynaecological cancer; our colposcopy service is funded by the National Cancer Screening Service and is one of the largest units in Europe. We delivered 7,855 babies to 7,694 mothers and 1,243 admissions to our NICU during the year.

The NMH established a Community Midwifery Service in 1998 that offers homebirth, domino birth and early transfer home programmes. This service covers Dublin and North Wicklow and continues to be the busiest Community Midwifery Service in Ireland.

The NMH has built up a reputation for undergraduate and postgraduate training and holds international courses on the Active Management of Labour each year. The hospital also educates undergraduate and postgraduate midwives. There is a very extensive professional development programme for midwives and nurses within the hospital. An annual higher diploma programme in Neonatal Nursing Studies is facilitated in conjunction with the two other Dublin maternity hospitals and the Royal College of Surgeons Ireland (RCSI).

The NMH is part of the Ireland East Hospital Group (IEHG) which comprises 11 hospitals in total. The IEHG is Ireland's largest hospital group serving 1.1 million people, with University College Dublin (UCD) as its main academic partner. There are three other maternity units within the IEHG: Midland Regional Hospital Mullingar, St. Luke's General Hospital Kilkenny and Wexford General Hospital. There is significant inter-linking of services between the Hospital and other hospitals including St. Vincent's University Hospital, Temple Street Children's University Hospital and Our Lady's Hospital for Sick Children, Crumlin, and Mater University Hospital.

Many staff from within the Hospital continue to work on the proposed relocation of the Hospital to the Elm Park Campus. During the year, the main focus was on the completion and submission for approval of the Final Business Case and the legal framework documents which were successfully undertaken. Work continues on the Operations Readiness stream of the Project. All meetings transferred to the Microsoft Teams Platform during the COVID-19 pandemic.

"It remains one of Europe's largest maternity hospitals with 146 inpatient beds... The hospital's Neonatal Intensive Care Unit is recognised as a national referral centre for complicated pregnancies, premature babies and sick infants."

While we await the build of the new National Maternity Hospital at Elm Park, we continue to seek critical capital investment in the current campus with most of the buildings nearing 100 years of age.

We are seeking Capital Funding for a two storey modular building to be located in the car park to house essential Hospital Sterile Supplies Department (HSSD), our Perinatal Autopsy and Bereavement Suites. While the current campus will never be fit for purpose, with continuously expanding services we require additional appropriately sized and fitted infrastructure. Our new Labour and Birthing Unit (LBU) extension was completed during 2021 affording five modern delivery rooms including a hydrotherapy pool for labouring

patients. The new Theatre development was also completed with ongoing refurbishment of the old Theatres now taking place. The Hospital continues to engage with the HSE to secure the capital funding for both the LBU and Theatre Programmes.

The 2nd NMH Research and Innovation Symposium took place in December; this was organised by Prof Fionnuala McAuliffe at which we presented the Declan Meagher Medal for Research and Professor Colm O'Herlihy Medal for Innovation.

The year continued to be dominated by the COVID-19 pandemic. Our task force team continued to meet weekly during the year ensuring all aspects of care were managed appropriately including testing of patients and staff, isolating of suspected or confirmed cases, provision of appropriate personal protective equipment, distillation of evidence and guidance in real time, expansion of our testing platforms to meet demands. Much of the altered infrastructure put in place to manage patient safety during the pandemic was removed and ward areas returned to normal function towards the end of the year. Visiting guidelines were altered in accordance with National advice and our own consideration of patient need. By the end of the year, the only area in which we could not fully accommodate partner access were the outpatient clinics. During the course of the pandemic, our grossly inadequate infrastructure had a very significant impact on our ability to have partners in attendance during what can be such special but also sometimes difficult moments in a family's life.

Congratulations to Dr John Murphy, Consultant Neonatologist, who was awarded the RCPI Kathleen Lynn medal for exceptional service on behalf of children. It is the highest award in Ireland to recognise paediatricians that have been outstanding in their careers and in their contribution to paediatrics.

Congratulations also to Prof Fionnuala McAuliffe who was announced as a winner of the 2021 the International Federation of Gynaecology and Obstetrics (FIGO) Women's Awards: Recognising Female Obstetricians and Gynaecologists. The Awards recognise those women who, throughout their careers, have promoted better healthcare for women, mothers and their children.

I would to take this opportunity to thank all the staff for their selfless dedication to their patients over the past twelve months.

Prof Shane Higgins
Master

Helen McHale, CMM2, with her niece Yvonne Tallon and grandniece Indie.

Honorary Treasurer's Report

The overall outturn for 2021 reflected a deficit of €6.7m based on HSE funding of €76.0m. The hospital continued to generate income from private and semi-private patients. In 2021, this was €12.0m, which was 3.3% up on prior year figures.

Total costs incurred were €94.5m. Of this €70.9m related to Pay and €23.6m to Non-Pay expenditure. As with previous years, the cost base of the hospital remains largely fixed with staff costs accounting for 75% of hospital spend. The major elements of the Non-Pay costs relate to medicine, pathology costs, medical supplies and maintenance of the aging building.

The hospital continues to incur costs related to dealing with the ongoing impacts of COVID-19 including lost income. These amounted to €2.7m for 2021. When COVID-19 related costs and provisions noted below were excluded, the operations of the hospital came in almost exactly in line with budget yet again.

The hospital has recorded a considerable deficit in the current year. This report has noted in previous years the decisions taken by the Executive Committee to move ahead with using cash reserves to fund essential capital works on the development of a new Labour and Birthing Unit and a new Theatre. This was based on discussions with Ireland East Hospital Group (IEHG) who indicated that funding would be forthcoming in due course. These works were completed late 2021 / early 2022. It is actually one of the advantages of the Voluntary Hospital system that the Executive Committee (Board) can act faster in decision making to prioritise patient safety. However, IEHG/ HSE has yet to contribute to these essential capital works. In the interests of prudent accounting given the age of the debtor, the hospital has been required to make a provision in full against the capital funds due from the HSE at the year-end of €7.2m, which has pushed the hospital into deficit.

In addition to the ongoing impacts of COVID-19, the hospital also had to contend with the cyber event in 2021. From a financial perspective, this meant in particular the hospital was unable to process claims with the insurers for quite a period of time. This had quite a considerable impact on the timing of cash receipts and it has taken many months for this to come back to something close to a regular cash cycle once again.

The hospital has utilized all of its cash reserves to fund the capital works. This cash challenge was then compounded by the impact of the cyber-attack. The hospital is managing this by seeking advance drawdown of its revenue allocation from the HSE. As it stands at the date of writing this report, absent receipt of these capital monies, NMH will be in a continuous position of seeking advance drawdown of revenue funding to manage cash flow. The reasons for this level of uncertainty and ongoing time delays in receiving funding from the State in return for services delivered under a Service Level Agreement are unknown. This situation continues to frustrate proper financial planning and place the hospital under undue financial pressures.

Other areas of focus by the Finance Committee during 2021 included governance, policies and procedures, management of debtors, monitoring compliance with the Charities Act and a consideration of a move to SORP accounting.

I would like to extend my appreciation to all the NMH Finance Team and my fellow members of the Finance Committee in particular Christine Moran who resigned from the Committee in November 2021. The NMH Finance Team have successfully exercised strong financial control whilst concentrating on essential spend to ensure we can continue to deliver excellent care in the midst of continued challenges. The NMH has had an amazing year in the context of such major crises, and it is an organisation we are all proud to be a part of.

Michele Connolly
Honorary Treasurer

Chief Pharmacist, David Fitzgerald with the first shipment of the COVID-19 Vaccine for Staff on 7th January 2021.

Executive Committee Report

Pat McCann Deputy Chairman and Prof Shane Higgins, Master.

Executive Committee (The Board)
At the AGM the outgoing members of the Board were re-elected save for Mr Justice David Barniville who did not go forward for re-election. Mr Justice Barniville was a member of the Board for four years and we thank him for his time and commitment to the Hospital.

Mr Nicholas Kearns was re-elected as Deputy Chair at the first Board meeting following the 2021 AGM.

Cllr. Alison Gilliland replaced Cllr Hazel Chu as Lord Mayor in June 2021. We welcome Cllr. Alison Gilliland to the Board and are grateful for her continuing interest in the Hospital and work as a Board member.

Cllr. Patricia Roe, appointed by Dublin City Council, joined the Board in April 2021 and resigned in June 2021. Cllr. Cat O'Driscoll was appointed by Dublin City Council in July 2021.

In July 2021, Mr Nicholas Kearns resigned as Deputy Chair and from the Executive Committee after 6 years in the role. Mr Kearns has been a strong advocate for the re-location of the Hospital to the Elm Park campus and we thank him for his enormous time, commitment and dedication to the Hospital. He was a tower of strength and oversaw the Hospital through many challenges during his time as Deputy Chair. We are pleased that Mr Kearns remains a Governor of the Hospital.

The Executive Committee, at their meeting in July 2021, elected Mr Pat McCann as Deputy Chair. Mr McCann was Chief Executive of Dalata Hotel Group Plc since it was established in 2007 and has been president of IBEC, a member of the Board of the Irish Heart Foundation and formerly Chair of the Board of Whitfield Hospital. We welcome him to the National Maternity Hospital and thank him for his interest and positive approach to all challenges presented to the Hospital.

Ms Christine Moran resigned from the Executive Committee in November 2021 and we thank her for her time and commitment to the Hospital during the preceding four years and, in particular, for her work with the governance and finance process.

Dr Diarmuid Martin, Archbishop of Dublin, retired during the year and we wish him every happiness in his retirement. We congratulate Archbishop Dermot Farrell, on his elevation as Archbishop of Dublin from 1st January 2021 and wish him every success in his new role.

Board Work

The Co-location Committee undertook a considerable amount of work during the year, reporting to the Board, on the legal documentation for the proposed move of the Hospital to Elm Park. Special meetings of the Board were held in May 2021 and June 2021 covering aspects of the re-location.

The cyber attack on the HSE systems did not affect the Hospital's system other than the systems that cover the MN-CMS (Maternal and New-born Clinical Management System) and IPMS (Integrated Patient Management System) which affected the digital records of patients and impacted on the registration of births as well as cash flow payments from insurers. Ironically the Hospital had taken a leading role in the State in digitalising patients' records which was impacted by the cyber-attack.

At each monthly meeting of the Board, reports from members of the Executive Management Team (the EMT) are discussed and where considered appropriate, further direction is given by the Board to the EMT. Clinical aspects of these reports are covered elsewhere in the Annual Report.

Corporate Governance

In 2021 the Charities Regulator's Code of Governance applied to the Hospital for the first time: the Hospital has been consistently in compliance with the Code.

Board Induction took place on two occasions during the year, for new Board members and a refresher induction for existing members.

The Board met on 14 occasions in 2021: All meetings were held remotely through zoom due to the Covid pandemic with an option to attend in person from July. Attendances were as follows:

Member	Meetings Attended	Meetings Appointed to Attend
Mr Nicholas Kearns, Deputy Chairman (to July)	8	8
Mr Pat McCann, Deputy Chair	9 (6 as DC)	9
Mr William Johnston, Hon. Secretary	14	14
Ms Michele Connolly, Hon. Treasurer	9	14
Prof. Shane Higgins, Master	14	14
Mr Justice David Barniville	7	7
Ms Ingrid Browne	14	14
Ms Mairéad Butler	14	14
Ms Denise Cole	13	14
Fr. Enda Cunningham	13	14
Mr Aidan Devlin	13	14
Mr Frank Downey	13	14
Cllr James Geoghegan	8	14
Ms Gráinne Hennessy	12	14
Prof. Declan Keane	14	14
The Lord Mayor, Cllr. Hazel Chu (from June 2020)	1	7
The Lord Mayor, Cllr. Alison Gilliland (from June 2021)	6	7
Ms Christine Moran	9	12
Dr John Murphy	13	14
Prof. Fionnuala McAuliffe	12	14
Ms Jane McCluskey	12	14
Dr Roger McMorrow	14	14
Prof. Peter McParland	13	14
Cllr. Cat O'Driscoll	6	6
Prof. Colm O'Herlihy	11	14
Cllr. Naoise Ó Muirí	13	14
Ms Patricia O'Shea	14	14
Ms Nóirín O'Sullivan	7	9
Dr Michael Robson	12	14
Cllr Patricia Roe	1	4
Mr Stephen Vernon	13	14
In Attendance		
Mr Ronan Gavin	14	14
Ms Mary Brosnan	14	14
Mr Alistair Holland	14	14
Ms Yvonne Connolly	2	2
Dr Luke Feeney	1	1
Ms Alice Murphy, MH&C	1	1
Ms Nicola Byrne, MH&C	1	1

His Grace the Catholic Archbishop of Dublin does not attend the meetings.

Prof Shane Higgins, Master (left) and Pat McCann, Deputy Chairman (right) with Bernadine O'Driscoll, Masters' Secretary, who was accepting the John F. Cunningham Medal on behalf of her son Dr David O'Driscoll who was awarded it in 2020 but due to the pandemic there was no medal presentation. The John F. Cunningham Medal is awarded to the UCD/ NMH student who obtains the highest 1st class honours in their obs/ gynae exam and overall honours in their final examinations.

Governors

At the AGM, seven Governors whose seven-year terms expire prior to the next AGM and who offer themselves for re-election were re-elected as Governors namely, Mr Stephen Vernon, Ms Rachel Hussey, Ms Niamh Callaghan, Mr Aidan Devin, Ms Lisa Taggart, Ms Helen Caulfield and Ms Marie Daly Hutton.

Mr Padraig McManus did not go forward for re-election at the AGM. Mr McManus was a Governor for six years and we wish to thank him for his commitment to the Hospital and in particular, for his invaluable work in assisting with the establishment of the NMH Foundation.

The election of Ms Nóirín O'Sullivan and Mr Pat McCann as Governors by the Executive Committee in May 2021 was ratified at the AGM.

Justice David Barniville and Ms Christine Moran ceased to be Governors during the year.

SUB COMMITTEES OF THE BOARD

Finance Committee

As can be seen from the Financial Report summarised on page 217 the Hospital closed the year with a deficit of €6.7m. Further detailed commentary on the finances are provided in the Honorary Treasurer's Report, page 12

The Committee met on 12 occasions during the year. Attendances were as follows:

Members of Finance Committee	Meetings Attended	Meetings Appointed to Attend
Mr Nicholas Kearns, Deputy Chair (to July)	6	6
Mr Pat McCann, Deputy Chair (from Sept.)	4	4
Ms Michele Connolly, Hon. Treasurer	8	12
Mr William Johnston, Hon. Secretary	12	12
Prof. Shane Higgins, Master	12	12
Ms Christine Moran (to Nov.)	7	10
Ms Denise Cole	10	12
In Attendance		
Mr Ronan Gavin	12	12
Ms Mary Brosnan	12	12
Mr Alistair Holland	12	12

Audit Committee

The Audit Committee continued its work throughout the year and a separate report on the work of the Committee is provided on page 25.

The Committee met eight times during 2021 and attendances were as follows:

Members of Audit Committee	Meetings Attended	Meetings Appointed to Attend
Mr Frank Downey, Chair (to June)	8	8
Mr Aidan Devlin, Chair (from June)	8	8
Ms Michele Connolly, Hon. Treasurer	5	8
Ms Mairéad Butler	7	8
Prof. Peter McParland (to June)	0	6
Ms Christine Moran (member June to Nov.)	1	1
In Attendance		
Mr Ronan Gavin	8	8
Mr Alistair Holland	8	8
Ms Ann Rath, ADOMN (from June)	1	2
Ms Christine Moran (as attendee)	1	1
Mr Carl Alfvag	1	1
External Attendees		
Mr Jessie de Guzman, PWC	2	2
Mr Richard Sammond, PWC	2	2
Mr Qaiser Ali Shah, BDO	1	1
Mr Alan Davidson, Crowe	3	3
Ms Katelynne Pilcic, Crowe	2	2
Mr Shane McQuillan, Crowe	1	1

QRPS Committee

The QRPS (Quality Risk & Patient Safety) Committee continued its work throughout the year and a separate report on the work of the Committee is provided on page 26.

The QRPS Committee met on seven occasions in 2021. Attendances were as follows:

Members of QRPS Committee	Meetings Attended	Meetings Appointed to Attend
Ms Patricia O'Shea, Chair (to June.)	6	7
Ms Mairéad Butler, Vice Chair (to June) Chair (from June)	7	7
Dr Ingrid Browne	6	7
Mr Aidan Devlin	6	7
Mr Frank Downey (to June)	0	4
Prof. Declan Keane	5	7
Ms Jane McCluskey	6	7
Dr Roger McMorrow	5	7
Prof. Colm O'Herlihy (to June)	1	4
Cllr. Naoise Ó Muirí	7	7
Prof. Fionnuala McAuliffe (from June)	3	3
In Attendance		
Ms Mary Connolly, AON	6	7
Mr Ronan Gavin	7	7
Dr Luke Feeney	7	7
Mr Carl Alfvag (part of)	4	4
Mr Martin Creagh (part of)	1	1

Co-Location Committee

The Co-location Committee continued its work throughout the year and a separate report on the work of the Committee is provided on page 27.

The Committee met on seven occasions during 2021. Attendances were as follows:

Members of Co-Location Committee	Meetings Attended	Meetings Appointed to Attend
Mr Stephen Vernon, Chair	7	7
Mr Pat McCann, Deputy Chairman (from Sept.)	2	2
Ms Michele Connolly, Hon. Treasurer	5	7
Ms Gráinne Hennessy	7	7
Dr Roger McMorrow	7	7
In attendance		
Mr Nicholas Kearns, Deputy Chairman (to July)	2	2
Prof. Shane Higgins	7	7

Dr Orla Sheil	6	7
Mr Ronan Gavin	7	7
Ms Nicola Byrne, MH&C	2	2
Ms Larisa Maldea, MH&C	1	1

Nominations Committee

The Nominations Committee provides the Board with recommendations in relation to the appointment of Governors and the appointment of members of the Executive Committee and other committees provided for under the Charter and Bye-laws and Regulations. The Nominations Committee met once during 2021. The members of the Committee are Mr Pat McCann, Deputy Chair, Mr William Johnston, Honorary Secretary, Ms Michele Connolly, Honorary Treasurer, Prof. Shane Higgins, Master, Ms Denise Cole, Prof. Declan Keane, Ms Eugenée Mulhern, Dr John Murphy and Ms Paula Reid.

Medical Fund Committee

This Committee, which receives funds from the semi-private clinic, provides funding principally for education and research relating to the medical services provided by the Hospital. A separate report on the work of the Committee is provided on page 28.

The Medical Fund Committee met on seven occasions during 2021. Attendances were as follows:

Members of the Medical Fund Committee	Meetings Attended	Meetings Appointed to Attend
Mr William Johnston, Hon. Secretary, Chair (to October)	4	4
Ms Michele Connolly, Hon. Treasurer, Chair (from October)	3	3
Prof. Shane Higgins, Master	6	7
Prof. Peter McParland	7	7
Mr Frank Downey	5	7
Ms Gráinne Hennessy (from June)	3	4
Prof. Declan Keane (member from June)	4	4
In Attendance		
Prof. Declan Keane (as attendee)	3	3
Ms Michele Connolly (as attendee)	3	4
Mr Ronan Gavin	7	7
Mr Alistair Holland	6	7
Mr Francis Rogers	7	7
Richard Salmon (PWC) (part of)	1	1
Mr Jessie Guizman, (PWC) (part of)	1	1

Executive Ethics Committee

The Executive Ethics Committee met once during the year to review the terms of reference, the Committee's effectiveness/self-assessment and review the succession/skill mix.

The members of the Executive Ethics Committee are: Dr John Murphy, Chair, Prof. Shane Higgins, Master, Ms Catherine Altman, Dr Ingrid Browne, Ms Denise Cole, Ms Caroline Devlin, Mr Frank Downey, Dr Paul Downey, Ms Jane McCluskey and Cllr. Naoise Ó Muirí.

House Committee

The Committee, which is one of the longest serving, assists in ensuring that the Hospital's infection control strategies are effective. The work of the Committee involves carrying out on-site inspections of various areas in the Hospital. In 2021, due to COVID-19, there was only one inspection and one meeting of the House Committee which was held in December 2021. The Committee expect to resume their work in 2022. The Members of the Committee are Ms Catherine Altman, Chair, Ms Sara Appleby, Ms Mary Brosnan, Ms Sheena Carton, Ms Jane Collins, Ms Fiona Davy, Ms Elaine Doyle, Ms Lydia Ensor, Ms Kate Higgins, Ms Judith Meagher, Ms Margaret McCourt, Ms Anne Murphy, Ms Teresa Murphy, Ms Kathleen O'Grady, and Ms Aoife O'Shea.

Maternity Hospitals Joint Standing Committee

The Committee of the three Dublin Maternity Hospitals meets monthly to discuss issues of common interest and concern. During 2021 the Committee, under the chairmanship of Dr Don Thornhill, continued to meet via teleconference to discuss issues of common concern. The main issues were COVID-19 and its related challenges including vaccine services. They also discussed standard consent forms, home birth services, NPEC Audit on Perinatal Mortality, prenatal services in Dept. of Clinical Genetics, bench marking incident reporting, health insurers, inter-state transfers, Sláintecare and HIQA National Bereavement Survey.

CHARTER DAY

Due to the COVID-19 pandemic, the annual Charter Day reception did not take place in 2021, the first time since the Hospital began celebrating the Charter in 1958.

However, the Charter Day Lecture was held via webinar and in the Lecture Theatre on Friday, 17th September 2021. The 64th annual Charter Day Lecture entitled "The Placenta – A Love Story" was delivered by Dr Sanne Gordijn, PhD, Consultant Perinatologist, University Medical Center, Groningen, the Netherlands.

A Symposium was also held on Friday, 17th September 2021 in the Lecture Theatre as part of the Charter Day celebrations. The symposium was chaired by the Master, Prof. Shane Higgins and the following lectures were delivered:

"Placental Assessment Post-Amsterdam Standardisation"
Dr Paul Downey, Consultant Histopathologist.

"Fetal Growth Restriction and the Placenta"
Prof. Wessel Ganzevoort, Consultant Obstetrician, University Medical Center, Groningen, NL.

"COVID – and the Next Virus…"
Dr Susan Knowles, Consultant Microbiologist.

"Psychological Impact on Patients and Staff of COVID and Lockdown"
Prof. Antony McCarthy, Consultant Psychiatrist

"From the Barker Hypothesis to Rethinking Agency of Patients with Obesity"
Prof. Carel Le Roux, Professor of Experimental Pathology, UCD.

HOSPITAL AWARDS & CERTIFICATES

Awards for 2021 are as follows:

Medical Students

John F. Cunningham Medal - Dr Sorcha Lynch
RCSI/NMH Medal - Dr Rachael O'Toole
Kieran O'Driscoll Prize - Aveen Van Der Hoven
A. Edward Smith Medal - Not awarded

Student Midwives

Hospital Gold Medal
Alice Dunne (BSc in Midwifery)
Ella Connaughton (Higher Diploma in Midwifery)

Elizabeth O'Farrell Medal
Orlagh Carey (BSc in Midwifery)
Róisín Moran (Higher Diploma in Midwifery)

Neonatal Medal - Anna O'Loughlin
(established by Dr Niall O'Brien)

We congratulate them all and wish them every success in their future careers.

During the year, Dr John Murphy, Consultant Paediatrician, was awarded the Dr Kathleen Lynn Medal by the Faculty of Paediatrics for his exceptional service on behalf of children.

Prof. Fionnuala McAuliffe won an international award at the 2021 FIGO Women's Awards: Recognising Female Obstetricians and Gynaecologists.

NMH Research and Innovation Symposium

On December 3rd, 2021 the NMH Research & Innovation Symposium (RISE) was held with abstracts from various Hospital departments submitted. Twenty oral presenters were short-listed and prizes were awarded to oral and poster presenters in both the Innovation and Research categories. The standard was excellent.

The Declan Meagher Innovation Medal was awarded to Dr. Sharon Dempsey, Paediatric SpR for her project entitled "National Neonatal Heart Valve Donation Protocol".

The Colm O'Herlihy Research Medal was awarded to Ms Caroline Brophy, Clinical Midwife Manager for her project entitled "Perineal Granulation Tissue - The POPPY Clinic Experience".

APPOINTMENTS, PROMOTIONS, RETIREMENTS AND DEATHS

New appointments during 2021 included:
Dr Lucia Hartigan, Consultant Obstetrician/ Gynaecologist
Dr Samantha Doyle, Consultant in Clinical Genetics
Dr Carla Canniffe, Consultant Cardiologist
Dr David Cosby, Consultant Obstetrician/ Gynaecologist
Dr Robert Ffrench-O'Carroll, Consultant Anaesthesiologist
Dr Niamh Adams, Consultant Paediatric Radiologist
Dr Kirk John Levins, Consultant Anaesthesiologist

Dr Nikki Higgins, Consultant Anaesthesiologist
Dr Sorca O'Brien, Aspire Fellow, Integrated Care Programme
Elga Grimes, Clinical Specialist Radiographer
Oleg Shrolik, Senior Clinical Engineering Technician
Zelda Greene, Clinical Specialist Speech & Language Therapist
Rosie Kirwan, Senior Pharmaceutical Technician
Rachel Sheane, Senior Dietitian
Eimear Ryan, Senior Dietitian
Lisa Brady, CNM 2, Pre Assessment Clinic
Elaine Smyth, CNS, Perinatal Mental Health
Caoimhe de Brun, Deputy Human Resources Manager

Internal Promotions 2021 included:
Blaithin Quinlan, CNM2, Unit 8 Neonatal
Sally Horton, CMM2, Community Midwife
Donna McNamee, CMM2, Community Midwife
Deirdre Molloy, CMM2, Perinatal Mental Health
Claire McElroy, CMM2, Gynaecology / Women's Health
Niamh Murray, cAMP, Gynae Clinic / Women's Health
Laura Harrington, Head of Medical Social Work
Ciara Buggy – Senior Medical Social Worker
Laura Kennedy, Chief Medial Scientist, Haematology
Orla Cormack, Chief Medical Scientist Quality Officer
Donal Noonan, Senior Medical Scientist Blood Transfusion
Damian Lally, Specialist Medical Scientist Laboratory Information Systems
Aoife Reynolds, Senior Medical Scientist Blood Transfusion
Bernadette Lavin, Payroll Supervisor
Glenn Kynes, Assistant Portering Manager

Long Serving Staff
We would like to congratulate and thank the following staff members, who have not retired, but who have reached 40 years' (or more) service in 2021:

Bernadine O'Driscoll	Administration
Mary McAlinden	Administration
Annette Kelly	Administration
Mary Anderson	Laboratory
Nora Curran	Household

Staff Retirements
The following staff members retired during the year after many years of service:-

Luke MacKeogh, Medical Scientist, Chief	41 years
Maureen Ward, Administration	41 years
Florence Fee, Clinical Midwife Manager 2	40 years
Margaret Fanagan, Clinical Midwife Manager 2	40 years
Anne Marie Kelly, Clinical Midwife Manger 2	39 years
Dr Kevin McKeating, Consultant Anaesthetist	31 years
Denise O'Byrne, Enhanced Midwife, Senior	27 years
Mary Corkery, Senior Radiographer	24 years
Veronica Hawkins, Household	23 years
Mary McKenzie, Senior Staff Nurse	20 years
Thomas Mullen, Portering	19 years
Chandini Anilkumar, Senior Staff Midwife	18 years
Malarvizhi Rangasamy, Staff Midwife	18 years
Jenely Cabales, Enhanced Nurse, Senior	18 years
Dace Milgrave, Catering Assistant	17 years
Elizabeth Kinsella, Household	17 years
Catriona Cullen, CMM3	15 years
Hilal Siddiqui, Registrar	12 years

We thank each of them for their enormous contribution during their many years of service and wish them a very happy retirement.

Deaths
During the year a number of our retired staff died and we send our sincere condolences to their families. They include: Ms Marie Martin, CNM1, Ms Irene Buckley, (Biochemist) and Ms Patricia Murphy, household.

Conclusion
The Board are grateful to the Executive Management Team for their unrelenting work during the year of exceptional challenges brought about through COVID-19. The Master, Professor Shane Higgins, the Director of Midwifery and Nursing, Ms Mary Brosnan, the Secretary/General Manager, Mr Ronan Gavin, the Clinical Director, Dr Roger McMorrow and their teams, and indeed all persons who have devoted their time during the year in the Hospital, deserve our special appreciation for their unstinting and selfless dedicated work in their care of mothers and babies.

Mr William Johnston
Honorary Secretary

Secretary/General Manager's Report

NMH Pharmacy and other pharmacy colleagues at the stand-down ceremony for the Aviva Mass Vaccination Centre in August.

During 2021 everyone at the Hospital, patients, staff and visitors, continued to experience the impact of the ongoing COVID-19 pandemic. Due to the uncertain nature of the pandemic this was a difficult time. However, in spite of these ongoing challenges, as usual all of our staff rallied together and continued to provide excellent care for all of our patients. During the year we had 7,694 births, 3,154 gynaecological operations and 1,243 neonatal admissions. We had a total of 178 staff who contracted COVID-19 and were off sick and 68 adult patients and 3 neonates attended as inpatients while they were COVID-19 positive. Thankfully the majority of these staff and patients recovered from their illness.

In January, the Hospital received vaccinations from the HSE for administering to health care workers. A multi-disciplinary team consisting of staff from all areas was quickly formed and over the course of four days in January this vaccination team administered over 1,200 individual 1st dose vaccines to NMH staff and to staff from other Hospitals in our vicinity. In addition, our team was asked to assist with staff and patients in Leopardstown Park Hospital and on Saturday, 16th January 2021 the NMH Team vaccinated a total of 385 people onsite in Leopardstown and on 6th February returned and administered 441 doses to staff, patients and local GPs, GP practice staff and community pharmacists. The entire setup and operation of our vaccination team at such short notice and the number of vaccines administered in such a short period of time was an amazing achievement. By the end of February almost 100% of Hospital staff had received two doses. The ongoing pandemic and the various variants necessitated continuous vigilance and Hospital staff continued to implement the necessary infection control procedures and restrictions throughout the year. All of these measures including the ongoing requirements for daily swabbing and testing of staff and patients, infection controls and cleaning, are tasks that requires the input of many staff and this is a long term resourcing requirement. Once again all of our NMH staff should be proud of their efforts in fighting the pandemic.

One aspect of the pandemic was that it again highlighted the issues with our current infrastructure and the lack of space. Whilst our team quickly adapted to the ongoing challenges the need for additional space onsite in advance of co-location to the Elm Park site was again a significant concern. Proposals for a modular build to deal with urgent issues and the additional COVID-19 requirements had been developed during late 2020 and

were submitted to the HSE in early 2021. It is hoped that these proposals can get approval and be fast tracked as we will remain onsite for a number of years while the co-location project gets final approval, is tendered and constructed and then commissioned. During 2021 the Labour & Birthing Unit project was completed and the Theatre project continued and is expected to complete early 2022. Both of these projects were identified as urgent requirements in relation to ongoing provision of patient care.

Another major issue for the health system during 2021 was the cyber-attack which took place in May. NMH was not directly affected by this attack as all of the security systems and controls implemented by our IT Department prevented direct penetration into our hardware and software. However, as we utilise a number of central HSE systems we suffered indirectly due to these systems being offline and unavailable for a number of weeks. A number of systems were involved but the primary issue was in relation to the MN-CMS (Maternal and Newborn Clinical Management System) which is the primary data source for clinical activity. Not only was there no access to update records but there was no access to many records which was a major concern and difficulty for all staff. It took many weeks for systems to be brought back online and the back load/update of the records for the downtime period took many months. NMH IT security systems prevented direct attack and this highlights the need for ongoing vigilance and investment as we may not be so fortunate in the future. In addition, the denial of access to certain key central systems was still a very significant issue and there needs to be national strategy to prevent or manage any such event in the future. Hospitals who have successfully managed to secure their own systems should not be in a position where they cannot access vital patient data because it is being stored centrally.

Despite all of the foregoing we continue to enhance and evolve our services for women with the assistance of IEHG and NWIHP. During the year we made submissions and received funding for a number of new projects including the establishment of a menopause service, MESH referral service including pain management service, and public infertility services. Previously established national referral services such as Fetal MRI continued to evolve with the support of NWIHP. We continue to offer support to the IEHG with Dr Orla Sheil assisting the Master, Prof Shane Higgins in relation to the IEHG Maternity Network Group and also specific service areas such as Perinatal Mental Health, Placental Pathology and post mortems.

I wish to thank all of the staff for all of the ongoing commitment and dedication to the NMH and our patients.

Work has continued to ensure that we continue to meet modern governance standards and also comply with all relevant regulations and guidelines. During the year a new Deputy Chairman, Mr Pat McCann, was elected and is engaged in a review of the various NMH Board Committees. In addition, we also documented and confirmed our compliance with the Charities Regulators Code of Governance during 2021. Work continued in line with compliance and internal audit on continually reviewing and improving our processes. Work in relation to reviewing and extending tendering and procurement compliance continued at a slower pace than planned due primarily to the ongoing issues around procurement relating primarily to COVID-19.

Once again, many of our Department's excelled during the year. The Hospital's Laboratory and the Environmental Department continued to retain their accreditations to the highest of national and international standards. The Catering Department achieved 99.5% in the FSPA (Food Safety Professional Association) awards; retained accreditation of the ISO 22,000: 2018 – Food Safety Management Systems; were awarded the Irish Heart Foundation – Silver Medal Award and were finalists in the Irish Hotel and Catering Gold Medal awards in two categories – Best Team and Healthcare Caterer. Congratulations to all staff in these areas for their commitment and hard work.

I wish to thank all of the staff for all of the ongoing commitment and dedication to the NMH and our patients. I would also like to thank my colleagues on the Executive Management Team, Prof. Shane Higgins, Master, Mary Brosnan, DOMN, Alistair Holland, Financial Controller and Dr Roger McMorrow, Clinical Director for all of the ongoing assistance, advice and good humour during the year. I would also like to thank the Executive Committee and all of the members of the various Board sub committees who offered advice and support throughout the year. And I would like to extend a special thanks to Clare Gray and Pam Robinson without whose invaluable commitment and support it would not be possible for me to function in my role.

Ronan Gavin
Secretary/General Manager

Mary Brosnan, Director of Midwifery and Nursing (left) and Pat McCann, Deputy Chairman (right), with Hospital Gold Medal recipient Aisling Kenny (Higher Diploma in Midwifery).

Director of Midwifery and Nursing Report

This year was dominated once again by the impact of the COVID-19 pandemic which has continued to take its toll on so many aspects of our lives. Little did we think in March last year that the virus would continue to mutate and cause such havoc across society. The disruption in health services and the impact of deferred care due to cancellation of many hospital and community services has been extremely difficult for patients in general. In the maternity setting it was not possible to defer any aspect of care. As we often say, babies don't wait. Without the choice of cancelling or deferring care, our multidisciplinary team in the National Maternity Hospital had to restructure our services and maintain two pathways of care for Covid positive and non Covid patients in order to ensure everyone's safety.

Our COVID-19 taskforce continued to meet weekly or more often as the service needs dictated. Best practice guidelines on appropriate maternity care and infection control measures were continually being updated during the year as more evidence emerged about optimal management of pregnant women infected with COVID-19 and for the protection of staff in the workplace.

The COVID-19 vaccination programme was commenced in January, and we were fortunate to be amongst the first health care facilities to receive the vaccine to administer to all staff on the campus. The 7th of January was one of the most exciting days ever, with hundreds of staff queueing patiently, socially distanced of course, whilst our vaccination team managed to vaccine over 800 people in a couple of days. We offered colleagues in GP practices,

public health nurses and other hospitals nearby, the opportunity to avail of vaccination which was so appreciated, and no doses were therefore wasted of this precious commodity. There was palpable excitement and relief amongst staff that they were receiving protection against infection. It has to be remembered how frightening it was for the previous nine months for health care staff, having to work with the underlying concern of getting sick themselves or bringing the virus home to their families. The hospital team were so efficient at rolling out the vaccine that other organisations sought advice about the methods adopted. Our team also facilitated vaccinations in Leopardstown Park Hospital, the older persons care facility to vaccinate staff and patients over two weekends.

Another big challenge was the commencement of the roll out of the vaccine to pregnant women. In the late Spring, research was emerging confirming the safety of the vaccine for pregnant women. The hospital was then required to facilitate all women to be vaccinated and this was a huge logistical task which our team managed very well. The roll out required a huge amount of counselling and patient support as a lot of misinformation about vaccine safety in pregnancy circulated on social media.

Some of the adaptations we had to make in the initial stages of the pandemic have enhanced care and are here to stay.

During the year we constantly managed the workload involved in conducting COVID-19 testing, swabbing, management of results, communication, and contact tracing. The level of input from the ADOMs and Occupational Health, Infection control teams and Laboratory teams have been very intensive on a daily basis. Ms Jenny Fitzgerald joined the Occupational Health team in August and has made a big contribution to the team. Congratulations to Sarah Cullen and the Bereavement Team who were selected as a finalist in the HSE Excellence Awards for supporting bereaved parents during the pandemic.

The challenge of managing staff absenteeism due to cocooning or self-isolation due to potential exposure, has been an ongoing burden for the midwifery and nursing managers, who deserve such credit for leading their teams during these difficult times. The entire staff showed care and compassion for patients and each other, coming to work despite all of the concerns for personal safety. I particularly want to thank the midwifery and nursing staff who worked with COVID-19 positive patients during the year. Women who are infected with COVID-19 have enormous levels of anxiety for their unborn babies and therefore it takes a lot of time to reassure and support them.

Some of the adaptations we had to make in the initial stages of the pandemic have enhanced care and are here to stay. Many of our online or digital resources for parents are helping to improve education and emotional support. Webinars, Breastfeeding classes, virtual clinics utilizing 'Attend Anywhere' have all increased and they are an enhancement rather than a full substitution for face to face communication.

Just when we thought we were emerging from the challenge of COVID-19, into an easier summer period, the HSE health system was hit by a cyber-attack on the 10th of May. The crisis was acutely felt in our hospital, due to the fact that we are entirely dependent on the MN-CMS electronic patient record, which was shut down, along with all other digital platforms and patient administration systems. The hospital was immediately required to revert to paper based medical records and the stress levels for everyone were acute, given the complete vacuum of patient data and the potential for medical errors. However, the professionalism of the team, including the I.T. and MN-CMS local support team, was demonstrated yet again in overcoming this adversity and patient care was not disrupted. The retrospective data entry for all the clinical information was an enormous task and this continues to be a workload for the team at the moment.

Despite all of the adversity, we have managed to continue to expand services for maternity and women's health. Many new roles have been funded by the National Women's and Infants health programme to support the National Maternity Strategy. The Perinatal Mental Health team have expanded to include Ms Deirdre Molloy and Ms Elaine Smyth. Ms Helen Thompson was appointed as the CNM 2 in the Gynaecology Clinic. Ms Niamh Murray was appointed as a candidate ANP. The complex menopause service commenced in November and will be providing a service for IEHG patients in the coming months as it expands. I am delighted to congratulate Ms Claire Mc Elroy as the new clinical specialist in this area, working with Dr Deirdre Lundy and the team.

The Bereavement Team on the 'Walk to Remember' to raise funds for The NMH Foundation to support bereaved parents.

We also welcomed Ms Lisa Brady as CNM2 in the Pre Aassessment Clinic. Ms Blaithin Quinlan was appointed as CMM 2 Neonatal Transport and Ms Sally Horton & Ms Donna McNamee took up their roles as Community Midwives.

In 2021 many senior staff members retired from our team after many long years of service to the hospital which was greatly appreciated by ourselves and by patients throughout their careers. Ms Chandini Anilkumar Ms Jenely Cabales, Ms Catriona Cullen, Ms Margaret Fanagan, Ms Florrie Fee. Ms AnneMarie Kelly, Ms Mary McKenzie, Ms Denise O'Byrne and Ms Malarvizhi Rangasamy. We wish each of them many years of good health and happiness in the future.

I want to express my gratitude to all the midwifery and nursing and health care assistant staff for all they do to support maternity, neonatal and gynaecology care within the hospital. I want to pay particular tribute to my Assistant Directors of Midwifery and Nursing on day and night duty who work tirelessly to support the service and support me personally too in my role. The CMM 3's carry a huge responsibility for the management of all of the units and each of them continue to make a great contribution to our team in the last year. My PA Ms Siobhan Flanagan and my HR colleague Ms Lisa Murray and all the HR team are extremely hardworking and support us every day.

The old Chinese proverb states 'May you live in interesting times'. Well never was this more true. We are facing into a period of severe shortages of health care staff. The evidence of the 'Great Resignation' is in front of us. This is being noted across the world, where employees are moving to different roles or making decisions to work in a different way, having experienced this world wide pandemic. Health care and maternity services in Ireland are beginning to see higher levels of emigration of midwives and nurses, as society opens up especially in Australia and our challenge is to address workforce planning and seek wider solutions to concerns about housing and the cost of living in Dublin to support staff retention and staff welfare.

The staff in the National Maternity Hospital work so hard on a daily basis to support women during pregnancy and childbirth or having a gynaecological procedure and I am very proud to lead the midwifery and nursing team. The requirement for progress on the new hospital at Elm Park has never been more urgent, as the pressures for space and improved facilities on our current site becomes more acute. We continue to provide excellent maternity, neonatal and women's health care despite the infrastructure but women and staff deserve better facilities. Let's hope next year sees momentum in respect of the new hospital.

Audit Committee

The Audit Committee's role is to provide assurance as to the effectiveness of the Hospital's systems of internal control, including financial operational and compliance controls and non-clinical risk management.

To that end, the Audit Committee convened 8 times during the year including meeting with the Hospital's external auditors, PWC, to agree their terms of engagement for the audit of the Hospital's annual financial statements and meeting with the Hospital's internal auditors, Crowe, to agree their work plan for the year.

In addition to reviewing annual compliance returns to HSE, the Audit Committee also considered internal audit reports during the year into Rostering, On Call and Overtime Procedures and Patient Billing.

The Audit Committee continues to oversee preparations for the adoption of the Charities SORP (Statement of Recommended Practice) for the Hospital's accounts which will become mandatory in 2023.

The members of the Audit Committee are Mr Aidan Devlin (Chair), Ms Mairéad Butler, Ms Michele Connolly and Mr Frank Downey. Ms Ann Rath is in attendance. Dr. Peter McParland retired from the Committee in June 2021 and I would like to thank him for his time and commitment.

Aidan Devlin
Chair

Quality Risk and Patient Safety Committee

The Quality, Risk and Patient Safety Committee (QRPS) operates under Terms of Reference approved by the Board. These are reviewed annually and changes made as needed.

The main aims of the QRPS Committee is to:
(1) understand the risks to which the patients and the staff are exposed;
(2) to drive quality, risk and patient safety strategy, management and improvement within the NMH and
(3) to provide a level of assurance to the Board that there is adequate and suitable governance of quality, risk and patient safety in place.

To these ends, the QRPS Committee met seven times during the year, as well as several sub-group meetings. At these meetings, reports from various departments were reviewed, covering matters such as data protection, incident management and risk management in general.

Two main contexts influenced the 2021 calendar - the continuing management of the COVID-19 pandemic and the impact of the cyber-attack on the HSE systems in May. These absorbed extensive resources from both medical and non-medical staff. While most of the Hospital's own systems were not directly impacted, the attack on the HSE did have some knock-on impacts and created a need for reversion to manual systems in certain situations. In terms of COVID, there were impacts on patients, their partners and staff. Our priority remained the safety of the mothers and infants, but this created some upset amongst patients. As an older Hospital, our ability to provide complete segregation was limited, so reducing visitors was one of the few options available to us

The members of the QRPS Committee are:
Ms Mairéad Butler, Chair, Dr Ingrid Browne, Mr Aidan Devlin, Prof Declan Keane, Prof Fionnuala McAuliffe, Ms Jane McCluskey, Dr Roger McMorrow, Cllr Naoise Ó Muirí and Ms Patricia O'Shea. In accordance with Clause 8.1 of the QRPS Committee mandate, Ms Mary Connolly (external advisor, AON), Dr Luke Feeney (Director of Quality Risk & Patient Safety) and Mr Ronan Gavin (Secretary/Manager) also attend.

Baby AJ.

The Committee thanks the Master, Prof Shane Higgins, Mr Ronan Gavin, Dr Luke Feeney and Ms Mary Connolly for their support and assistance throughout the year.

Mairéad Butler
Chair

Co-Location Committee

The Committee had three main pillars of work in recent years. As the Operational Readiness Phase 1 had been completed most of the Team were effectively stood down pending the approval of the Final Business Case (FBC). Substantially work continued on the ICT elements of operational readiness and also in working with HSE Estates, SVUH and the Design Team in relation to finalising the Stage 2C report. The Final Business Case which was submitted by the Project Board to HSE in June 2020 continued through the review process in HSE and at year-end had been approved by the HSE Board for submitting on to the Department of Health (DOH) for the next stage of the process. DPER will have an input into the process before the FBC receives full approval and this will hopefully be in Mid-2022 and this will trigger a number of actions which will allow the project to move into the next phase.

The next area was the Operational Readiness (OR) which, as mentioned, was effectively stood down except for the ongoing work in relation to ICT which is chaired by Dr Jenny Walsh. The Operational Readiness Phase 2 is unlikely to be approved and commenced until the FBC review process is complete and the FBC receives formal approval.

Finally, the substantial work during the year was around the legal structures and primarily the documents relevant to the property and buildings and NMH DAC. As noted in previous reports at the beginning of 2021 the property documents had been substantially completed and agreed. However, for various reasons, there was further work done on these documents with some additional wording in some areas which we overall believe strengthens the documents for NMH. In addition, as part of the discussions around these documents, there were requests to consider and review the draft constitution for the DAC which NMH had initially presented in early 2019. This additional piece of work required a number of engagements and interactions between the various parties and by year-end there was substantial agreement with only some "fine tuning" required. The NMH Executive was involved in reviewing these documents a number of times during the period. We anticipate, subject to final agreement on certain clauses, that these documents are in a form substantially agreed by NMH, SVUH, HSE and DOH that early in 2022 the agreement of all parties will be formally noted and that this will trigger the next phase of the Project. This will involve the lodging of the 146B planning and the issuing of SAQs for enabling works and the main contract. The tender for the main contract and the Operational Readiness Phase 2 are both dependent upon the approval of the FBC which is currently going through the required process from HSE to DOH to DPER and we anticipate a favourable outcome probably in mid-2022. We look forward to this new and exciting phase of the Project.

Members of the Co-Location Committee are Mr Stephen Vernon, Chair, Mr Pat McCann, Ms Michele Connolly, Ms Gráinne Hennessy and Dr Roger McMorrow. I would like to thank all of the Committee members for their time, commitment and invaluable input over the course of the year.

Mr Stephen Vernon
Chair

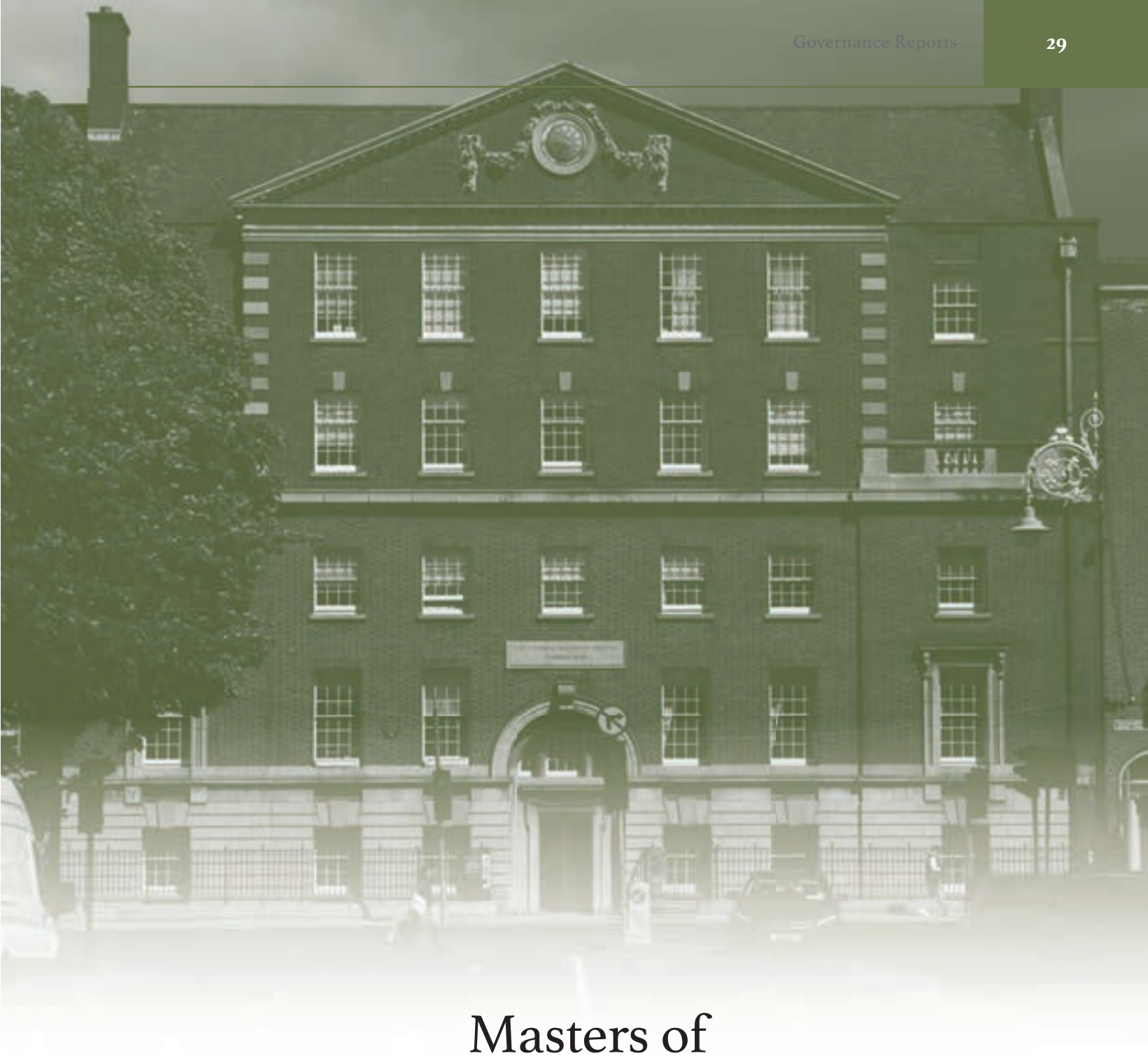
The Medical Fund Committee

The Medical Fund, as set out in the Hospital Charter and Byelaws, provides funding for education and research related to women's health care. It receives its funding from the 'Fitzwilliam Clinic' semi-private clinic, whose costs and revenues are shared between the consultants who operate the semi-private clinic and the Medical Fund. The semi-private clinic offers a third category of care for patients of the National Maternity Hospital that falls between the public hospital offering and that offered on a fully private basis.

During 2021 the Medical Fund received a total of €1,268k income from its share of the semi-private clinic activities. Its share of the costs to operate the clinic, amounted to €771k of which €345k related to clinic salaries. That resulted in funds available for charitable purposes of €497k. This was used to fund a variety of activities including the provision of €343k funding towards four WTE Research Fellows and €123k for other comparable research and education activities. The Fund made a surplus of €19k during the year.

The Medical Fund Committee meets on a regular basis and reports to the NMH Executive Committee. The Medical Fund Committee comprises the Master, Professor Shane Higgins, Prof. Peter McParland and Prof. Declan Keane who are the elected representatives from the obstetrics & gynaecology consultants of the NMH, and Ms Michele Connolly, Mr Frank Downey and Ms Gráinne Hennessey who are nominated by the NMH Executive Committee. Mr William Johnston also served as Chair of the Committee until October of 2021.

Michele Connolly
Honorary Treasurer Chair



Masters of The National Maternity Hospital

2019 –	Shane Higgins
2012 – 2018	Rhona Mahony
2005 – 2011	Michael Robson
1998 – 2004	Declan Keane
1991 – 1997	Peter Boylan
1984 – 1990	John M. Stronge
1977 - 1983	Dermot W. MacDonald

1970 – 1976	Declan J.Meagher
1963 – 1969	Kieran O'Driscoll
1956 – 1962	Charles F.V. Coyle
1949 – 1955	Arthur P. Barry
1942 – 1948	Alex W. Spain
1932 – 1941	John F. Cunningham
1924 – 1931	Patrick T. McArdle

1923	Sir Andrew J. Horne
	Patrick T. McArdle
1909 – 1922	Sir Andrew J. Horne
	Reginald J. White
1894 – 1908	Patrick J. Barry
	Sir Andrew Horne
1885 – 1893	William Roe

Charter Day Lectures

2021	**Dr. Sanne Gordijn, PhD.**	"The Placenta – A Love Story"
2020	**Dr. Roch Cantwell**	"There is no Health without Perinatal Mental Health"
2019	**Professor Alan D. Cameron**	"Each Baby Counts - a Five Year Quality Improvement Programme"
2018	**Professor Lesley Regan**	"Current challenges for the President, Royal College of Obstetrics & Gynaecology, UK"
2017	**Dr David Hugh Richmond**	"When will we ever learn?"
2016	**Dr Jeanne A. Conry**	"The Ostrich And The Obstetrician Gynaecologist: How The Environment Can Impact Reproductive Health"
2015	**Dr John O. L. DeLancey**	"Birth, Pelvic Floor Injury and Prolapse: Who Cares?"
2014	**Professor Mark Kilby**	"Fetal Medicine & Therapy: A Fantastic Step Forward But Are We Delivering A Good Service?"
2013	**Professor Michael Raymond Foley**	"Discovering Fulfilment as a Medical Professional – Ancient Wisdom for Modern Medicine"
2012	**Professor Michael de Swiet**	"Saving Mothers' Lives: Lessons to be learned from the Confidential Enquiry into Maternal Mortality"
2011	**Professor Dian Donnai**	"Genetic Medicine – Possibilities and Promises"
2010	**Professor James Eisenach**	"Pain Pregnancy & Depression."
2009	**Dr Kenneth J. Leveno**	"Caesarean Memories"
2008	**Dr. Terry Inder**	"The Pathway to Improving Neurodevelopment in at-risk Infants – Nurturing Fetal and Neonatal Neurons"
2007	**Prof Wolfgang Holzgreve**	"Fetal Cells and DNA in maternal circulation- clinical importance for non-invasive prenatal diagnosis and maternal diseases"
2006	**Dr. José Belizán**	"Calcium Intake During Pregnancy- Maternal and Fetal Outcome"
2005	**Dr. Robert C. Pattinson**	"Getting the Right Thing Done"
2004	**Prof. Thomas F. Baskett**	"The Evolution of Operative Vaginal Delivery"
2003	**Prof Heman V. Van Geijn**	"Is Cardiotocography to Blame?"
2002	**Joseph J. Volpe**	"Brain Injury in the premature infant – is it preventable?"
2001	**Professor Frank A. Manning**	"Echoes from the Past: the Alpha-Omega Theory."
2000	**Raymond J. Reilly**	"Surgical Gynaecology, the Past, the Present and the Future."
1999	**Paul Hilton**	"Vesicovaginal Fistula – Of Historical Interest?"
1998	**Sir Naren Patel**	"Chronogenetics – Role of Obstetricians."
1997	**Dr. Fredric D. Frigoletto Jr.**	"Is Obstetric Practice Evidence based?"
1996	**Carol J. Baker**	"Group B Streptococcal Disease: Pilgrims' Progress."
1995	**Prof. Fiona Stanley**	"Cerebral Palsy – Contribution from the Antipodes."
1994	**R. W. Beard**	"Medicine in the New Europe – The Impact on Obstetrics and Gynaecology"
1993	**Knox Ritchie**	"Sad – but can anything be done? …"
1992	**John Monaghan**	"A Century of Subspecialization in Gynaecological Oncology – are we progressing?"
1991	**Charles Whitfield**	"The Rh Story"
1990	**Roy M. Pitkin**	"Anatomy and Physiology of a Peer Review Journal"
1989	**Claude Sureau**	"Decision making in reproductive medicine."
1988	**Geoffrey Chamberlain**	"One up on Dactylonomy"

1987	Hugh Philpott	"Obstetrics of Poverty."
1986	Charles R. Scriver	"Medelian Disease – What can it do to us? Can it be treated?"
1985	Alexander C. Turnbull	"Learning Obstetrics in Scotland, Wales, England and Ireland."
1984	Sir Rustam Feroze	"What alternative to what Medicine?"
1983	William Dignam	"Post Graduate Education in Obstetrics and Gynaecology in the U.S.A.: At the Crossroads."
1982	Richard Mattingly	"New Horizons in Cervical Cancer Detection."
1981	Robert H. Usher	"The Very Low Birth-weight Infant – Immediate and Long Term Prospects."
1980	Shirley Driscoll	"Placentas I Have Known."
1979	John S. Tomkinson	"Ultimate Tragedy."
1978	Otto Kaser	"Post-operative Complications."
1977	Denis Cavanagh	"Eclamtogenic Toxaemia – The Science and the Art."
1976	John H. Pinkerton	"The Tell Tale Heart."
1975	Marcel Renaer	"Transplacental Haemorrhage as a Cause of Perinatal Mortality and Morbidity."
1974	James Scott	"Counting the Cost"
1973	Mogens Ingerslev	"Modern Democracy in the National Health Service"
1972	Ian Donald	"Naught for Your Comfort"
1971	Raymond Illsley	"Social Limitations on Obstetric Management."
1970	Christopher J. Dewhurst	"The Place of Modern Technical Advances in Obstetrics."
1969	Dunanc Reid	"The Right and Responsibility."
1968	G. J. Kloosterman	"The Practice of Obstetrics in the Netherlands."
1967	Sir John Peel	"Pre-Diabetes in Obstetrics and Gynaecology."
1966	Hugh McLaren	"The Conservative Treatment of Cervical Pre-Cancer."
1965	John McClure Browne	"Placental Insufficiency."
1964	Sir Hector MacLennan	"Version."
1963	Harold Malkin	"The Art of Obstetrics."
1962	Charles Scott Russell	"The Fetus and its Placenta."
1961	Sir Norman Jeffcoate	"Prolonged Labour."
1960	John Stallworthy	"The Debt We Owe."
1959	George Gibbard	"Changes in the Manifestations of Puerperal Sepsis."
1958	Sir Arthur Gemmell	"Some thoughts on the Adrenal in pregnancy."

Executive Committee (The Board)

Pat McCann, *Deputy Chairman*
Pat has over fifty years' experience in the Hotel business. He started in 1969 in Ryan Hotel Group plc before joining Jurys Hotel Group plc in 1989. He retired from Jurys Doyle in 2006 and founded Dalata Hotel Group in 2007. Pat served as President of Ibec from September 2019 to September 2020. Pat was Chairman of Whitfield Hospital in Waterford from 2011 to 2018. He is currently a Non-Executive Director of Glenveagh and a number of private companies. On March 2nd 2021, Pat announced his retirement from Dalata Hotel Group plc.

William Johnston, *Honorary Secretary*
William Johnston is an economics graduate of Trinity College Dublin, a solicitor, the external examiner in Banking Law for the Law Society, a member of the Banking Law Senior Advisory Board of the International Bar Association, and a Director of the Housing Finance Agency and the Port of Waterford.

Michele Connolly, *Honorary Treasurer*
Michele Connolly is a Chartered Accountant with over 25 years commercial experience. She is currently a partner in professional practice. She specialises in supporting State, Semi State, not for profit and commercial companies in fund raising, development of new infrastructure and general financial matters.

Prof Shane Higgins, *Master*
Shane Higgins, is a Consultant Obstetrician/ Gynaecologist and the current Master of The National Maternity Hospital. He is an Associate Professor at UCD, Department of Obstetrics & Gynaecology and has a special interest in Maternal-Fetal Medicine. Shane has a broad range of clinical and management experience gained within Ireland, Scotland and Melbourne, Australia.

Dr Ingrid Browne
A graduate of RCSI medical school, Ingrid Browne has been a Consultant Anaesthesiologist for the past 16 years to National Maternity Hospital and St Vincent's University Hospital. She is a fellow of the College of Anaesthesiologists and holds a Masters in medical science. She completed post graduate fellowship training in obstetric anaesthesia at Columbia University NYC.

Mairéad Butler
Mairéad Butler is a Chartered Accountant and has spent most of her career in financial services in Dublin and Sydney, working in risk, compliance and communications roles. She is also a Director of An Cosán, a charity focused on education as a pathway out of poverty.

Fr Enda Cunningham
Son of a NMH nurse, Fr Enda serves as Administrator of Westland Row parish and chaplain to the National Maternity Hospital.

Denise Cole
Denise Cole has 25 years of experience working in Human Resources and combines a wealth of strategic and operational HR and organisation development experience in both the private and public sectors. Her career includes seven years in KPMG in London and Dublin, thirteen years in acute hospitals; eleven years in Beacon Hospital as Head of HR and two years in St James Hospital as Head of HR Strategy. Denise is currently Head of HR for the Courts Service where she leads a People & Organisation Transformation programme.

Aidan Devlin

Aidan Devlin is a Chartered Accountant and a UCC Commerce graduate. He is a member of the Institute of Directors in Ireland and the Mediators Institute of Ireland. Aidan has over 35 years' experience in Corporate Banking and Project Finance both in Ireland and the Middle East. He is also a board member of an Affordable Housing Body and was a founding board member of the NMH Foundation.

Frank Downey

Frank Downey has over 30 years' experience as an Actuarial and Employee Benefits Consultant. Frank is an economics graduate of Trinity College, Dublin, a Director of Invesco Limited and an actuary and advisor for corporate clients. Frank also acts as a trustee for a number of large pension schemes.

Cllr James Geoghegan

James Geoghegan is an elected member of Dublin City Council, practising Barrister at Law in Ireland with a mixed civil practice with a focus on Banking Law, Administrative Law, European Union Law and civil proceedings related to crime.

Gráinne Hennessy

Gráinne Hennessy is a senior partner at Arthur Cox with over 28 years' experience in advising lenders and borrowers on syndicate finance, real estate finance, including some of the largest construction finance projects in the country, leveraged acquisition finance and debt restructurings. Gráinne was Head of the Arthur Cox Finance Department and a member of its management committee for 6 years. Gráinne is also one of two partners who are responsible for Arthur Cox's diversity and inclusion strategy.

Prof Declan Keane

Declan Keane has been a Consultant Obstetrician since 1985 and is a former Master of the Hospital. He has worked in the UK and the USA and was recently appointed as a Professor to the RCSI. He has considerable administrative experience and was a former member of the National Women's Council and was the obstetrician advising the Citizen's Assembly on the 8th Amendment.

Prof Fionnuala McAuliffe

Fionnuala McAuliffe is Chair and Professor of Obstetrics & Gynaecology, UCD, Director UCD Perinatal Research Centre, Head, Women's and Children's Health, UCD, Consultant Obstetrician & Gynaecologist at The National Maternity Hospital. Her subspecialty area is maternal and fetal medicine and she is Programme Director of the RCOG maternal and fetal medicine subspecialisation fellowship at NMH. She has received significant grant funding both nationally and internationally. Fionnuala has developed guidelines for pregnancy both in Ireland, UK and internationally.

Dr John Murphy

John Murphy is a Consultant Paediatrician in the National Maternity Hospital and Paediatric & Neonatal Clinical Lead with the HSE in Clinical Strategy & Programmes Directorate. His is also editor of the Irish Medical Journal.

Jane McCluskey

Jane McCluskey is a lawyer with a large multinational technology company and has over ten years' experience practising corporate, commercial and intellectual property law. She is also a registered trade mark agent. Jane is Mum to three children, all of whom were born at the National Maternity Hospital.

Dr Roger McMorrow
Roger McMorrow is a graduate of The Queens University of Belfast and he has been a consultant anaesthetist at the National Maternity Hospital and St Vincent's University Hospital since 2009. He has served as Clinical Director of the NMH since January 2018. He has a specialist interest in high risk obstetrics, clinical risk and high altitude mountaineering. In 2007 he was part of an expedition that reached the summit of Mt Everest.

Prof Peter McParland
Peter McParland is a Consultant Obstetrician/Gynaecologist in the National Maternity Hospital with a special interest in Maternal Fetal Medicine.

Nóirín O'Sullivan
Nóirín O'Sullivan most recently served as United Nations Assistant Secretary General for Safety and Security based in New York. Nóirín served as Garda Commissioner from 2014 – 2017. She holds a Masters in Business Studies from UCD Smurfit Business School. She has served two terms on the Governing Council of the Pharmaceutical Society of Ireland and chaired the Inspection and Enforcement Committee. She is a member of the North American Advisory Board of the UCD Smurfit Business School. Nóirín is the recipient of numerous awards including an Honorary Doctorate of Laws from the University of Ulster for Distinguished Public Service.

Cllr Naoise Ó'Muirí
Naoise Ó'Muirí has served as a Dublin City Councillor since June 2004 and is a former Lord Mayor of Dublin. Naoise studied Engineering at the National University of Ireland, Galway and runs a technology company.

Cllr. Cat O'Driscoll
Cat O'Driscoll represents the Cabra Glasnevin LEA and chairs the Arts and Culture Strategic Policy Committee in Dublin City Council. A native of Cork, Cllr O'Driscoll has been a board member of Quality and Qualifications Ireland and The National Forum for the Enhancement of Teaching & Learning.

Prof Colm O'Herlihy
Colm O'Herlihy is a medical graduate of University College Dublin and an Obstetrician Gynaecologist. He served as Assistant Master in the National Maternity Hospital and subsequently as Professor of Obstetrics & Gynaecology in UCD and the NMH for over 30 years. He has been a member of the Irish Medical Council and is currently a member of the Board of the Nurses & Midwives Board of Ireland.

Patricia O'Shea
Patricia O'Shea is a law graduate of University College Cork and is Group Head of Legal Affairs & Secretariat for a semi-state company. She was formerly General Counsel of a US multinational company serving as Company Secretary and a Director of a group company.

Dr Michael Robson
Michael Robson is a Consultant Obstetrician/Gynaecologist and former Master of the NMH. Dr Robson is Joint National Clinical Lead for the development of the Maternal and New-born Clinical Management System (electronic patient record). He also developed the methodology for the classification of caesarean sections, known world-wide as the Robson 10.

Stephen Vernon
Stephen Vernon is one of the founders of Green Property Group and has extensive experience in property and property development in Ireland and the UK. A Bristolian, educated in London, Mr Vernon has been based in Ireland for several years.

Executive & Sub Committees

Executive Committee
Dr Dermot Farrell, Archbishop of Dublin, *Chairman*
Lord Mayor of Dublin, Cllr. Alison Gillilard *(from June)*
Mr Nicholas Kearns, *Deputy Chairman (to July)*
Mr Pat McCann *(Member from May), Deputy Chairman (from July)*
Mr William Johnston, *Honorary Secretary*
Ms Michele Connolly, *Honorary Treasurer*
Prof. Shane Higgins, *Master*
Mr Justice David Barniville *(to June)*
Dr Ingrid Browne
Ms Mairéad Butler
Ms Denise Cole
Very Rev. Fr Enda Cunningham
Mr Aidan Devlin
Mr Frank Downey
Cllr. James Geoghegan
Ms Gráinne Hennessy
Prof. Declan Keane
Ms Christine Moran *(to Nov.)*
Dr John Murphy
Prof. Fionnuala McAuliffe
Ms Jane McCluskey
Prof. Peter McParland
Dr Roger McMorrow
Cllr. Cat O'Driscoll *(from July)*
Prof. Colm O'Herlihy
Cllr. Naoise Ó Muirí
Ms Patricia O'Shea
Ms Noirin O'Sullivan *(from May)*
Dr Michael Robson
Cllr. Patricia Roe *(from April to June)*
Mr Stephen Vernon
In Attendance
Mr Ronan Gavin, *Secretary/General Manager*
Ms Mary Brosnan, *Director of Midwifery & Nursing*
Mr Alistair Holland, *Financial Controller*

Finance Committee
Mr Nicholas Kearns, *Deputy Chairman (to July)*
Mr Pat McCann, *Deputy Chairman (Member from Sept.)*
Mr William Johnston, *Honorary Secretary*
Ms Michele Connolly, *Honorary Treasurer*
Prof. Shane Higgins, *Master*
Ms Denise Cole
Ms Christine Moran *(to Nov.)*
In Attendance
Mr Ronan Gavin, *Secretary/General Manager*
Ms Mary Brosnan, *Director of Midwifery & Nursing*
Mr Alistair Holland, *Financial Controller*

Audit Committee
Mr Frank Downey, *Chair to June*
Mr Aidan Devlin, *Chair from June*
Ms Michele Connolly, *Honorary Treasurer*
Ms Mairéad Butler
Prof. Peter McParland *(to June)*
Ms Christine Moran *(from June to Nov.)*
In Attendance
Mr Ronan Gavin, *Secretary/General Manager*
Mr Alistair Holland, *Financial Controller*
Ms Ann Rath, *A. Director of Midwifery & Nursing (from June)*

QRPS Committee
Ms Patricia O'Shea, *Chair (to June)*
Ms Mairéad Butler, *Vice Chair (to June) Chair (from June.)*
Dr Ingrid Browne
Mr Aidan Devlin
Mr Frank Downey *(to June)*
Prof. Declan Keane
Ms Fionnuala McAuliffe *(from June)*
Ms Jane McCluskey
Dr Roger McMorrow
Prof. Colm O'Herlihy *(to June)*
Cllr. Naoise Ó Muirí
In Attendance
Ms Mary Connolly, *AON*
Dr Luke Feeney, *Director of Quality, Risk & Patient Safety*
Mr Ronan Gavin, *Secretary/General Manager*

Co-Location Committee
Mr Stephen Vernon, *Chair*
Mr Pat McCann, *Deputy Chairman (Member from Sept.)*
Ms Michele Connolly, *Honorary Treasurer*
Ms Gráinne Hennessy
Dr Roger McMorrow
In Attendance
Prof. Shane Higgins, *Master*
Dr Orla Sheil, *Con. Obstetrician/Gynaecologist*
Mr Ronan Gavin, *Secretary/General Manager*

Nominations Committee
Mr Nicholas Kearns, *Deputy Chairman (to July)*
Mr Pat McCann, *Deputy Chairman (Member from Sept.)*
Mr William Johnston, *Honorary Secretary*
Ms Michele Connolly, *Honorary Treasurer*
Prof. Shane Higgins, *Master*
Dr Peter Boylan (*to May*)
Ms Denise Cole *(from June)*
Prof. Declan Keane
Ms Christine Moran *(from June to Nov)*
Ms Eugenée Mulhern
Dr John Murphy
Ms Paula Reid
In Attendance
Mr Ronan Gavin, *Secretary/General Manager*

Medical Fund Committee
Mr William Johnston, *Honorary Secretary, Chair (Member & Chair to Oct)*
Ms Michele Connolly, *Honorary Treasurer (Member & Chair from Oct)*
Prof. Shane Higgins, *Master*
Mr Frank Downey
Ms Gráinne Hennessy *(from June)*
Prof. Declan Keane *(from June)*
Prof. Peter McParland
In Attendance
Mr Ronan Gavin, *Secretary/General Manager*
Mr Alistair Holland, *Financial Controller*
Mr Francis Rogers, *Management Accountant*

NMH Executive Ethics Committee
Dr John Murphy, *Consultant Paediatrician, Chair*
Mr William Johnston, *Honorary Secretary (to June)*
Prof. Shane Higgins, *Master*
Ms Catherine Altman
Dr Peter Boylan *(to June)*
Dr Ingrid Browne
Ms Denise Cole *(from June)*
Ms Caroline Devlin *(from June)*
Mr Frank Downey
Dr Paul Downey
Ms Jane McCluskey *(from June)*
Cllr. Naoise Ó Muirí *(from June)*
In Attendance
Mr Ronan Gavin, *Secretary/General Manager*

House Committee
Ms Catherine Altman, *Chair*
Ms Sara Appleby
Ms Sheena Carton
Ms Jane Collins
Ms Fiona Davy
Ms Elaine Doyle
Ms Lydia Ensor
Mrs Kate Higgins
Ms Judith Meagher
Ms Margaret McCourt
Ms Anne Murphy
Ms Teresa Murphy
Ms Kathleen O'Grady
Ms Aoife O'Shea
Ms Bernie Spillane (to Nov.)

In Attendance
Ms Mary Brosnan, *Director of Midwifery & Nursing*
Mr Mark Anderson, *Hygiene Services Manager*

Board of Governors

Governors Ex-Officio
Dr Dermot Farrell (Archbishop of Dublin – Chairman)
Councillor Alison Gilliland (Lord Mayor - Vice Chairman) *(from June)*
Prof. Shane Higgins (Master)
Very Rev. Fachtna McCarthy, Administrator, Parish of Haddington Road
Very Rev. John McDonagh, Parish Priest of the Parish of Sandymount
Very Rev. Enda Cunningham, Administrator, Parish of St. Andrew, Westland Row

Nominated by the Minister for Health
Ms Patricia O'Shea
Vacant

Nominated by Dublin City Council
Councillor James Geoghegan
Councillor Patricia Roe *(from April to June)*
Councillor Cat O'Driscoll *(from July)*

GOVERNORS ELECTED

Dr Alan O'Grady
Dr John R McCarthy
Dr Niall O'Brien
Mr J. Brian Davy
Mrs Judith Meagher
Dr Jack T. Gallagher
Mr Gabriel Hogan
Mrs Anne Davy
Mrs Margaret Anderson
Mrs Kathleen O'Grady
Dr John F. Murphy, Obs
Dr Frances Meagher
Mr Kevin Mays
Dr Declan O'Keeffe
Professor Colm O'Herlihy
Mr William Johnston *(Honorary Secretary)*
Dr Peter Boylan
Mrs Joanne Keane
Mrs Anne Murphy
Mr Frank Downey
Mr Anthony Garry
Dr Freda Gorman
Mrs Jane Collins
Ms Alexandra Spain
Mrs Margo McParland
Mrs Catherine Altman
Dr John Murphy, Paeds.
Mr Niall Doyle
Ms Lydia Ensor
Ms Sara Appleby
Ms Caroline Hayes (Simons)
Dr Peter Lenehan
Dr Orla Sheil
Prof. Peter McParland
Ms Sheena Carton
Ms Elaine Doyle
Prof. Declan Keane
Ms Maeve Dwyer
Dr Kevin McKeating
Mrs Mary Donohoe
Ms Catherine Ghose
Mr Barry Dixon
Ms Paula Reid
Ms Suzanne O'Brien
Ms Margaret McCourt
Ms Bernie Spillane (RIP May 2022)
Ms Teresa Murphy
Ms Eugenée Mulhern
Ms Fiona Davy
Dr Michael Robson
Dr Deirdre MacDonald
Prof. Fionnuala McAuliffe
Ms Jane McCluskey
Ms Isabel Foley
Cllr. Naoise Ó Muirí
Ms Elizabeth Nolan
Dr Ingrid Browne
Mr Stephen Vernon
Ms Rachel Hussey
Ms Niamh Callaghan
Mr Aidan Devlin
Ms Lisa Taggart
Ms Helen Caulfield
Mr Padraig McManus *(to June)*
Ms Marie Daly Hutton
Mr Nicholas Kearns *(Deputy Chairman) (to July)*
Ms Michele Connolly *(Honorary Treasurer)*
Ms Aoife O'Connor
Ms Mairéad Butler
Ms Christine Moran *(to Nov.)*
Mr Justice David Barniville *(to June)*
Dr Roger McMorrow
Dr Rhona Mahony
Dr Paul Downey
Mrs Kate Higgins
Ms Aoife O'Shea
Ms Caroline Devlin
Ms Denise Cole
Ms Gráinne Hennessy
Mr Pat McCann *(Deputy Chairman) (from July)*
Ms Nóirín O'Sullivan

Professional Advisors

Law Advisors
Mason, Hayes & Curran, South Bank House, Barrow Street, Grand Canal Dock, Dublin 4.
Arthur Cox, Ten Earlsfort Terrace, Dublin 2.

Bankers
The Bank of Ireland, 2 College Green, Dublin 2.

Auditors
External
Price Waterhouse Coopers, Chartered Accountants, One Spencer Dock, North Wall Quay, Dublin 1.

Internal
BDO, Beaux Lane House, Mercer Street Lower, Dublin 2.
Crowe, Marine House, Clanwilliam Place, Dublin 2

Neonatology

Jack Barrett receiving treatment in the Neonatal Intensive Care Unit.

The start of 2021 was greeted with a certain degree of trepidation by the Department of Neonatology as we faced escalating numbers of COVID-19 infection. Equally, there was a surge of hope as the COVID-19 vaccination programme for high-risk adults and healthcare staff commenced. The year 2020 had been a challenging one and we looked forward to 2021 being somewhat easier. The huge turnout by staff and the willingness of the Irish population to roll-up their sleeves and be vaccinated was amazing and makes one very proud of this country and its wish to protect our most vulnerable. While the work in the Department continued unabated throughout 2021, it came as a great relief to know that staff and mothers were now protected.

During 021, while primarily focusing on our smallest and most premature babies, we had to maintain services to our healthy term babies at a time when many community services that are in place to support first-time mothers and babies had been suspended or were working at reduced capacity because of the pandemic. It often comes as a surprise to people to appreciate the extent of care provided by our Department. We supervise the care of all liveborn babies (n=7821) who are born in this hospital even if they do not require admission to the Neonatal Intensive Care Unit (NICU). Our staff attend all instrumental deliveries, emergency caesarean sections and the delivery of any baby where there are recognised risk factors. With instrumental deliveries at 12% and emergency C/S rates at 16%, it is no surprise that our staff are kept busy day and night. Every baby born in NMH undergoes a comprehensive physical examination by one of the neonatal team before discharge home. On average, we examine close to 21 babies a day. Apart from providing reassurance to parents, this examination allows us to pick up conditions including heart murmurs, unstable hips and congenital anomalies that may not have been suspected antenatally so that advice can be given and appropriate follow-up arranged. With mothers and babies spending less and less time in hospital, it is often a challenge to arrange such tests and referrals in such a short-time frame, particularly over weekends. We provide a nurse-doctor team

every third week to the national neonatal transport programme, a vital service that transports critically ill newborn babies from anywhere in the country. Our staff is available to meet any family in advance of a delivery where problems are anticipated. This service has grown significantly over the past few years for a variety of reasons including more widespread access to routine antenatal scanning, advances in neonatal care and recent legislation allowing for termination of pregnancy in cases of fatal fetal anomalies. Our care for a baby does not end when the baby is discharged from the hospital as many of our babies return to clinic for follow-up or are referred for assessment by their GP or Public Health Nurse. Our outpatient clinic sees an average of 12 babies a day.

Last year, we admitted 1,243 babies to the NICU. On average, 1 in every 6 babies delivered in this hospital is admitted to us even if only for a brief period of time. Many first-time parents are surprised to hear how high that figure is and are often not prepared for the fact that they may be separated from their baby for several hours. For the past number of years, we have made every effort to keep our admission rates for term infants (those infants born ≥37 wks gestation) as low as possible. We do this by auditing the reasons why babies are admitted and by looking at alternative ways to provide care that minimise the chances that mothers and babies are separated. In 2020, we introduced changes to how hypoglycaemia (low blood glucose) was managed in the newborn period. By doing so, our staff, supported by our nursing and midwifery colleagues on the postnatal wards, reduced the admissions for hypoglycemia from 306 babies in 2019, to 189 babies in 2020 and to 109 babies in 2021. We will continue to make incremental changes year on year guided by feedback received from families who have used our services. A core value in our Department is the concept of family-centred care, not just for those babies who spend long periods of time in our NICU, but also for those babies who may only be with us for a few days. As the clinicians caring for babies, we believe our role is to support families to provide as much of the direct care that their babies need as possible. Ideally, mothers (and partners) should be accommodated in beds beside their sick babies. Obviously, the infrastructural constraints of our hospital in its current location are the main reason why this cannot be achieved. This hospital was not built with modern neonatal intensive care in mind. This is another reason why this Department, along with the rest of the hospital, is fully supportive of our co-location to the St Vincent's University Hospital campus. In a newly-built modern hospital, one that is specifically designed with mothers and babies in mind, mothers and partners will be able to room-in with their babies' day and night. How can a healthcare service purport to be supportive of breastfeeding if mothers and babies cannot be cared for in the same location?

Our NICU is one of four designated tertiary care NICUs in this country that provides specialised care to the most premature of infants, many of whom are referred to us while still in utero (i.e. when the mother is still pregnant) from locations all around the country. Last year, we looked after 114 Very Low Birth Weight Infants (babies born ≤29 wks and/or ≤1500g). These infants are extremely vulnerable and often spend several weeks in hospital frequently not being discharged home before their due date. There have been major advances in neonatal intensive care medicine over the past 50 years and survival across all gestational ages is increasing. We now have reported survivors of infants born at 23 wks gestation. In our hospital, where healthy babies are born at a rate of about one every hour, it can be hard to fathom that just a few feet away, in our NICU on the first floor, a tiny baby weighing less than 1lb may be attached to a life-support machine, struggling to survive. The odds of a baby surviving at 23 wks is still quite low but some of these tiny babies can, and do, survive. Unfortunately, many will face ongoing challenges, particularly as they get older, in terms of their long-term neurodevelopmental outcome. As greater numbers of these tiny fragile babies survive, research has shown us that optimising babies' early neurosensory experiences, and social environment, impacts on their long-term neurodevelopmental outcome. By providing individualised, neuroprotective care to each baby, by gentle containment, minimising stress and pain, safeguarding sleep and optimising nutrition, it has been shown that babies have

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By providing individualised, neuroprotective care to each baby, by gentle containment, minimising stress and pain, safeguarding sleep and optimising nutrition, it has been shown that babies have better long-term physical, cognitive and emotional outcomes.

better long-term physical, cognitive and emotional outcomes. Such developmental care principles underpin all of our care practices in the NICU. Our multidisciplinary team (MDT) which includes Psychology (Marie Slevin), Physiotherapy (Jo Egan), Dietetics (Roberta McCarthy and her team) and Social Work complement the advanced medical and nursing care we provide, advising parents and staff alike on positioning, feeding and social interactions. With over 22 years of follow-up data on our premature infants, we know that many of our babies have ongoing feeding issues after discharge and frequently present with speech, language and communication delays. Therefore, we are delighted to announce three new staff appointments. Zelda Green is the first dedicated Speech and Language Therapist to be ever appointed to a NICU in this country and we look forward to the wealth of knowledge she will bring to this new role. Eimear Ryan and Catherine Shortall have joined the neonatal dietetic team and will focus primarily on developing the services we provide to our babies post-discharge.

Our NICU is one of 4 centres in the country that provides therapeutic hypothermia to infants with hypoxic ischaemic encephalopathy (HIE). In 2021, a total of 8 infants (6 inborn and 2 outborn) were reported with HIE of which 8 (6 inborn and 2 outborn) received therapeutic hypothermia. A further 3 infants (all outborn) were diagnosed with Neonatal Encephaopathy but did not meet the criteria for HIE. All 3 of these underwent therapeutic hypothermia. Details on these cases are included in this clinical report (see Neonatal Encephalopathy section). Further details, including data on long-term outcomes, are outlined in our Annual Neonatal Report 2021.

Our outpatient clinic continued to be very busy, no doubt in part due to the pandemic. In all, 3,159 babies were seen in clinic of which 1,827 were first-time visits and 1,332 were follow-up visits. Petria O'Connell and Lorraine White, two of our senior nurses, are charged with the smooth running of this clinic. Apart from overseeing the patients who attend, they triage numerous queries, provide a huge amount of advice over the telephone to families, GPs and community services and follow up on a myriad of investigations and referrals. While a large part of this work often goes unnoticed, the clinic could not provide such a good service to our families without their dedication. We congratulate them both on their recent promotion to CMM2 which was in recognition of the responsibilities of their role. The smooth running of the clinic has been further supported by the allocation of fulltime secretarial support and we welcome Aoife Cassidy to this new post.

Despite the challenges imposed by COVID-19, our Clinical Psychologist, Marie Slevin, continued her important work in seeing all our NICU graduates at 2 years corrected age for a detailed neurodevelopmental assessment. For those families that could not attend, because of COVID-19 restrictions, Marie used alternative methods to assess these babies by using validated parental questionnaires supported by phone contacts and/ or limited face-to-face assessments. Such data are invaluable by providing us with important feedback as to how our babies do in the long-term. Additionally, these assessments can provide families with very useful information that can be used to lobby for additional resources for their infant, if required.

Research continues to play a very important role in our Department under the leadership of our UCD Professor, Prof Colm O'Donnell. In 2021, the Department had three research registrars, Dr Emma Dunne, Dr Carmel Moore and Dr Caitriona Ní Chathasaigh, undertaking PhDs in the areas of neonatal resuscitation, thermoregulation, intubation and blood and platelet transfusion. Dr Madeline Murphy was awarded her PhD in 2021 for her work on the role of oropharyngeal surfactant in the Delivery Room. Dr Anna Curley was awarded a €1.22 million grant from the Health Research Board to continue her ground-breaking work on platelet function in newborn babies. The NICU participated in several multi-centred trials (including GeHPPI, a study on hypoglycemia in premature infants and SafeBoosC, a study on cerebral oxygenation in premature infants. Our NCHDs and nursing staff are encouraged to partake in local projects and audits and have the opportunity to present their work at local and national

meetings. The NMH Research and Innovation Study Day took place in December 2021, and we were delighted that one of our neonatal SpRs, Dr Sharon Dempsey, won the Professor Colm O'Herlihy Medal for Innovation for her work on developing a protocol for heart valve donation that will now be rolled out nationally. We are truly grateful to our families who are so willing to engage in research and for supporting us as we try to answer important questions about how best to care for their babies.

One achievement the Department would like to highlight this year is the continued promotion of breastfeeding for our most vulnerable babies. We actively encourage women to express breast milk for their premature babies and use those tiny precious drops of colostrum as babies' first feeds. With the support and encouragement, not just of the staff in the NICU but also of the staff on the postnatal wards, the numbers of babies receiving their own mother's milk is increasing and we are seeing for the first time, mothers who have successfully transitioned their baby from tube feeding to exclusive breastfeeding, before discharge home. Our staff should take great pride in the role they play in empowering women to successfully breastfeed their babies even when delivered prematurely.

While most babies make the transition to extra-uterine life without a problem, we know that about 5 in every 100 babies born at term require medical assistance to help them begin breathing. As time is of the essence, much effort is focused on training staff (and not just those working in the Department of Neonatology) in the art of neonatal resuscitation. Increasingly, it is being recognised that simulation is a powerful tool to teach practical skills, build proficiency and speed and encourage good teamwork. Dr Eoin O'Currain, Dr Carmel Moore, Ms Shirley Moore ANP and Ms Linda Smiles CNM2 now run weekly neonatal resuscitation simulations in various locations around the hospital. These sessions have been very well received by staff and have resulted in improved core competencies across all levels and grade of staff.

Our NICU managed to avoid the worst effects of COVID-19; we had 3 babies who tested positive for the virus in 2021. We were able to maintain our staffing ratios during the peaks of COVID-19 infection primarily because our staff undertook extra duties and supported each other whenever they could. While visiting to the unit continued to be restricted, no restrictions were placed on parents who were welcome to visit together, and for as long as they wished. Credit must be paid to our parents who, without fail, adhered to any restriction imposed with minimal complaint.

One of the benefits of COVID-19 was the rapid adoption of virtual platforms. In 2021, we continued to extend our use of "AngelEye" in the NICU, a secure camera system that allows mothers and fathers keep a watchful eye on their babies even when not in the hospital. This facility for families will be retained well beyond the pandemic in view of the positive feedback received. The option to access all teaching sessions and hospital meetings using a virtual platform is now standard, allowing staff much greater flexibility and leading to increased attendance rates. Families can now be offered the option of a virtual outpatient visit, if appropriate, and many have availed of the opportunity to avoid the need to travel to the hospital with a small baby. Our Allied Health Professionals and Clinical Discharge Coordinators took virtual platforms a step further and now host a number of parental educational webinars and facilitated Q&A sessions on-line and these have been very well received by families.

Another initiative advanced in 2021 was the Baby Bookworms Bookclub, the brainchild of one of our SpRs, Dr Lucy Geraghty. This was initially launched in 2019 but had to be abandoned because of COVID-19. It was relaunched in 2021 with full EMT support and is another part of the developmental care package that we aim to provide in the NICU. Families are given access to books in our library and are encouraged to read and chat to their babies when with them in the NICU. The sight of parents, amid all the monitors and surrounding technology, sitting beside their baby's incubator reading to them is heart-warming. Given the opportunity, our parents are keen to do everything in their power to create a 'home away from home' for their precious babies.

It would be remiss of us not to mention the cyber-attack at least in passing. Just when we thought that the worst of COVID-19 was over, another crisis loomed. While NMH was relatively unaffected

it is being recognised that simulation is a powerful tool to teach practical skills, build proficiency and speed and encourage good teamwork.

compared to other centres, this hospital is one of the few hospitals in the country that is entirely paperless, relying completely on an electronic health record. To have to resort to pen and paper with no access to essential IT systems was a nightmare. The fall-out of the cyber-attack is still evident with the hospital only recently completing the scanning of important patient information to patient records. While we want to forget those crazy few weeks, it did showcase the resilience of our staff, who faced this new disaster with good grace and stoicism. Hopefully, this cyber-attack will be a wake-up call to the HSE as the current IT infrastructure within our health service is grossly inadequate and severely underfunded.

Last, but certainly not least, mention must be made of our new website "nmhnicu.ie". Many of our families struggle to access information that is both factual and relevant to them. For years, the NICU has published a "Babies in Neonatal Care" booklet. However, our NICU decided to create an on-line resource for families. Dr Carmel Moore, Jo Egan (Physiotherapist), Roberta McCarthy (Dietitian), and Marie Slevin (Psychologist) working with Jenny Cotter, NMH Communications Officer, developed the clinical content (admittedly with contributions from so many others that it would not be possible to mention them all) and the website was launched on World Prematurity Day to substantial media coverage. The project was supported by Rethink Ireland and the NMH Foundation. The response from families, not just those attending our NICU, has been very positive. We hope that it helps our families more easily navigate their often stressful and frequently overwhelming journey through the NICU.

This short report has very much focused on the highlights of 2021. However, all aspects of the care we provide is audited on a yearly basis and is presented in much greater detail in our separate Annual Neonatal Report which is published later in the year. This neonatal report includes sections on admissions to the NICU, our VLBW population including their neurodevelopmental outcomes, infection rates, infant feeding and nutrition, ventilation, to name but a few. Only those sections which are of specific interest to our obstetric colleagues are included in this current report, namely our mortality tables and a synopsis of our neonatal encephalopathy cases. Please refer to our Annual Neonatal Report if further details on any aspect of the clinical work of our Department are required.

Many of our families struggle to access information that is both factual and relevant to them... our NICU decided to take this a step further by creating an on-line resource for families

May I conclude by taking this opportunity to thank the entire neonatal team. This includes my consultant colleagues, our non-consultant hospital doctors, many of whom are with us for more than one year, our neonatal nursing staff under the stellar leadership of our CMM3, Hilda Wall, our allied health professionals, our administrative staff and our dedicated household staff. We must also mention the many other ancillary services who support our work including the laboratory, pharmacy, radiology, infection control, ICT and bioengineering. We welcome our two new locum consultant neonatologists, Dr Nurul Aminudin and Dr Lyudmyla Zakharchenko, who are covering for three of our colleagues who are currently on leave. After many years of dedicated service, we said goodbye to two of our senior nursing staff in 2021, Florrie Fee CMM2 and Jenely Cabales, RSN. We wish them a long and happy retirement. We acknowledge the incredible service provided to this hospital by Professor Michael O'Keeffe, Consultant Paediatric Ophthalmologist. He established a screening and treatment programme for retinopathy of prematurity - a serious eye condition that affects preterm babies and can lead to blindness. Because of his expertise, our hospital soon became recognised as a centre of excellence for this condition, both nationally and internationally and many babies from around the country were specifically transferred to us for his expert opinion. We, and the babies for whom he cared, are very grateful for his tremendous contribution. We extend our thanks to our visiting consultants from Children's' Health Ireland at Crumlin and Temple Street who review our babies and provide us with their expert advice when needed. Special thanks to John Geoghegan (Clinical Data Analyst) and Fionnuala Byrne (Information Officer) for their work on this report. Lastly, we acknowledge all the parents and babies who passed through our NICU in 2021, and especially, the 41 babies who sadly died in our care; they remain in our thoughts.

NEONATAL DISCHARGE PLANNING SERVICE (Caroline McCafferty)

The Neonatal Discharge Planning Service continues to play a vital part in the care of the high risk infant

and family in the Neonatal Unit by streamlining each infant's discharge. This has been achieved by supporting and building a rapport with the family from admission until discharge and thereafter. The service offers support to parents as well as anticipating their needs pre- and post-discharge home. The Clinical Nurse Specialist (CNS) collaborates early with the Multidisciplinary Team and Community Support Services so that the best possible support is made available to the high risk infant and their family while an inpatient and post-discharge home.

Caseload & Activity

High risk infants include all preterm infants with birth weight <1500g or <32 weeks gestational age, infants with Neonatal Abstinence Syndrome, complex social admissions, life shortening Illnesses, infants requiring palliative care as well as infants with congenital abnormalities and brain Injury

Total Discharges Involving CNS: 263
Phone contacts: 600
Babies discharged home with tube feeding: 1

Training and Education

Staff are continually updated and advised regarding changes to discharge policies and procedures. Midwives, student midwives and student public health nurses are also updated by the CNS.

Education and Information

- A "Basic Life Support" class and "Preparing for Home" class are regularly provided and are also available online or a 1:1 basis for families and carers of high risk infants.

- Follow up calls are made to parents following their infant's discharge providing advice and support to families.
- The CNS continues to be the link person with the HSE appointed Northgate Hearing Screening Service that provides a national hearing screening programme for all infants.
- Chair the Inter-hospital Neonatal Clinical Nurse Specialist Group
- Lead in collaborating information on all babies with a confirmed diagnosis of Trisomy 21 for the National Down Syndrome Register which is run by the University of Dublin, Trinity College. An information pack has been developed for the families of babies with Trisomy 21 who are born in NMH
- Involved in Quality Improvement Initiatives including promoting Family-Centred Care and supporting early breastfeeding in the Neonatal Unit and sustaining same post-discharge home.
- Initiates and attends multidisciplinary team (MDT) meetings for vulnerable babies and their families.
- During the pandemic, worked closely with the NMH Foundation on e-learning and digital projects for families such as TV screens, NMH e-learning hub and the development of "nmhnicu.ie" - a support website for parents who have babies cared for in the Neonatal Unit.

Service Development

The CNS Development Programme has been completed. We are currently working on a business plan to investigate the need for an additional post for a CNS Neonatal Community Nurse to be involved in the care and early discharge home of haemodynamically stable babies over 35 weeks gestation and 1.8kgs

A Public Health Nurse Community Discharge Information Study Day is planned for 2022

Audit

The CNS was involved with developing the Parent Questionnaire for the Neonatal Unit

Hospital Committee Membership

Prime B –Breastfeeding and Infant Mental Health Group.

DEVELOPMENTAL FOLLOW-UP REPORT BY MARIE SLEVIN, DEVELOPMENTAL PSYCHOLOGIST, DEPARTMENT OF NEONATOLOGY

Neurodevelopmental Follow-up of Infants Born Preterm and Term

Our neurodevelopmental follow-up of infants born preterm (both inborn and outborn) now spans 22 years from 1997- 2019. Our follow-up of term infants diagnosed with neonatal encephalopathy (NE) at birth is in its 12th year. The Bayley Scales (Bayley-lll) which is one of the most widely used standardised tools for the assessment of neurodevelopment in early childhood is our key measurement of developmental outcome in these cohorts. However, the PARCA-R parent report questionnaire (see below for more details on this questionnaire) was used earlier in the year because of continued COVID-19 guidelines and later in the year for those families who declined an assessment or who did not wish to travel to Dublin for the assessment. These families were happy with their child's development to date. The PARCA-R accepts that parents are good

judges of their child's current abilities. It assesses cognitive and language development from 23.5 – 27.5 months of age. Unfortunately, the PARCA-R does not have a motor scale. Hence, motor follow-up was through discussion with the child's parents.

A total of 93 preterm infants born ≤1500g and/or ≤29 weeks' gestation, and 9 term infants with Neonatal Encephalopathy, were referred for follow-up in 2021. There was 1 additional independent referral. A total of 77 Bayley assessments and 18 PARCA-R Questionnaires were completed. The infants born preterm were assessed at two years corrected age. The term infants diagnosed with Neonatal Encephalopathy were assessed at two years' chronological age. An assessment at two years of age (2 years corrected age for preterm infants) is the optimum time to measure cognitive, language and motor outcome when following up these cohorts.

The assessment experience is also educational for parents as it gives them an insight into the range of developmental activities from which their child can benefit. The process can strengthen a child's potential by bringing about a change in parent attitude, knowledge and behaviour.

Of the 93 preterm infants listed for assessment, 85 (91%) were formally assessed. Of those families who did not have formal follow-up, one child died at 7 months of age, 3 children are living abroad with no forwarding contact details, one family did not attend and 3 families could not be located.

Some NICU graduates having a reunion in Merrion Square!.

This assessment is a significant event for these children and their families. 68% of the children assessed live outside the Dublin area travelling from as far as Donegal (10 children), Mayo/Sligo (7 children), Westmeath (8 children) and spanning counties Roscommon, Longford, Offaly, Wexford, Meath and Wicklow. 32% were from Dublin and the surrounding areas.

Preterm Group

69 children were assessed using the Bayley-lll Scales. 16 children were assessed using the PARCA-R Questionnaire. Results of their outcomes will be presented in the NMH Annual Neonatal Report for 2021 which will be published later this year.

Neonatal Encephalopathy Group

All 9 term children referred were followed-up (100%), 8 children using the Bayley Scales and one child using the PARCA-R Questionnaire. Only one child within this cohort had a normal outcome across all three parameters measured (cognitive, language and motor). Two children had a normal cognitive and motor outcome but had a language delay. The other children showed mild, moderate and/or extreme delays. These results will be presented in more detail in the NMH Annual Neonatal Report 2021.

The national neonatal encephalopathy collaborative is of increasing importance for term infants, particularly since the advent of therapeutic hypothermia (January 2009). Outcome for this group of infants is improving since the introduction of therapeutic hypothermia. However, we have seen from our small cohort over the years that expressive communication, cognitive development, sensory regulation, and gross motor development may require special attention when devising developmental guidelines for children with this diagnosis.

Independent Referral

One child was assessed using the PARCA-R and had a normal outcome.

What are the Bayley Scales of Infant and Toddler Development (Bayley-III)

The Bayley-III is an ability test of global development. It comprises of a series of play tasks and language stimulus books broken up into 3 composite scales with 5 sub-categories – cognitive development (**Cognitive Scale**), receptive and expressive communication (**Language Scale**) and fine motor and gross motor development (**Motor Scale**). It can classify delayed or advanced development within the specific sub-categories. The assessment session can take 2 hours or more to complete depending upon toddler cooperation, duration of assessment feedback and discussion with parents. The process can be tedious as the children are only 2 years of age, active and busy. It can be demanding when children are tired or challenged (especially for those travelling for more than 2-3 hours for the assessment). During the testing session, the child's emotional and behavioural reactions are noted. A full report is documented. The scores generated allow for a comparison between a child's performance over time and in relation to peers of the same age range. The scale identifies children with developmental delay and hence provides information for intervention planning.

What is the PARCA-R (Parent Report of Children's Abilities–Revised)?

The PARCA-R is a standardised, norm-referenced assessment of children's cognitive and language development at 24 months of age. It can assess a child's developmental level and can classify delayed development of any severity as well as advanced development. The children need to be assessed at 23.5 to 27.5 months to derive the standardised scores. There are separate scores for Non-Verbal Cognition and Language. The outcomes, 'above average', 'average', 'mild', 'moderate' and 'severe delay' can be calculated as used in conventional standard deviation (SD-banded) cut-offs. It is available in 14 languages. The PARCA-R is free and is immediately available to download *www.parca-r.info*. Since its first validation study was published in 2004, it has been used as an outcome measure in clinical trials, observational studies, and as a screening tool in child development clinics and neonatal follow-up services. The PARCA-R is a well-researched tool that took 20 years to develop. It has been the popular substitute for the Bayley Scales during the pandemic. It has been recommended by the NICE Guidelines as an assessment tool to screen for developmental delay. It has validity and reliability ratings providing standardised scores. It has been accepted as producing standard scores similar to other IQ/developmental tests. It has been favourably compared with the Bayley-lll.

...sessions examine preterm birth, educational outcomes, cognitive outcomes, behavioural outcomes and social and emotional outcomes.

Extreme Preterm Birth

Extreme preterm birth can be associated with high rates of adverse neurodevelopmental outcomes including cognitive impairment (low IQ - especially non-verbal, poor working memory, slow processing speed and deficits in executive functions), attention problems/ADHD, peer relationship problems/Autistic Spectrum Disorder, anxiety/emotional disorders and physical disability as well as subtle learning difficulties. Neurosensory issues are increasingly recognised. The preferred Bayley assessment enables the clinician to identify specific developmental delays, early signs of poor attention skills, poor auditory processing skills, poor sensory integration skills and poor motor/coordination skills. All of these factors are relevant in terms of later classroom performance. The process of administering the scale alone generates valuable information about a child's learning potential. Identifying and managing these issues at an early age is important to facilitate optimum long-term outcome. The assessment experience is also educational for parents as it gives them an insight into the range of developmental activities from which their child can benefit. The process can strengthen a child's potential by bringing about a change in parent attitude, knowledge and behaviour. This is a valuable service in terms of assessing two-year outcomes for preterm babies and the data is used when counselling parents when their babies are admitted to the Neonatal Intensive Care Unit (NICU).

Neonatal Encephalopathy Diagnosis

Neonatal encephalopathy impacts neurodevelopmental outcomes. Outcome is mainly determined by the extent of injury to the brain. High seizure burden is also associated with poor outcome. Long-term follow-up is very important for this cohort of infants.

Why are we doing these assessments?

Great advances have been made in neonatal intensive care over the past decade. Survival of infants born at 23 weeks' gestation is now increasingly reported. Unless we measure our neonatal outcomes, we cannot hope to make improvements in the care we provide. These assessments are also an important service for our babies and their families. The parents receive a detailed copy of their child's report. Copies of the report, if requested by the family, may be sent to other clinicians who are involved in the care of their child.

Professional resources continue to be very limited for those children requiring developmental intervention such as speech therapy, physiotherapy and occupational therapy. This was particularly evident during the COVID-19 pandemic when many children did not receive any follow-up at all. Waiting lists are long. There is often no service available when a therapist is on leave. There is a lack of consistency in how publicly-funded services are provided throughout the country. This has been recently addressed by the launch of a National Policy on Access to Services which was approved by the HSE in September 2021. The benefit of a national policy is that children will have more equitable access to services and to Children Disability Network Teams (CNDTs). The CNDT is replacing existing disability teams provided by Enable Ireland, the Health Service Executive (HSE) Early Intervention Teams and School-Aged Assessment Teams, St. Catherine's Association, St. John of Gods Services and St. Michael's House. Recommendations have been made for a more comprehensive post-discharge national programme in terms of developmental support for these children as outlined in the HSE publication of the Model of Care for Neonatal Services in Ireland (National Clinical Programme for Paediatrics and Neonatology) 2015.[1] The NICE Guideline NG72 provides a very comprehensive outline of the biomarkers for delay and the need for follow-up at 2 years and 4 years of age respectively[2]. Our Department is now in the process of developing a comprehensive Allied Health Professional Developmental Follow-up Clinic (The ACORN Programme) as part of our service for children born preterm or who are diagnosed with neonatal encephalopathy. This service will be provided in addition to a child's regular paediatric out-patient reviews.

Over the years we have noted that attention and sensory processing skills are two notable challenges for the preterm child who has had a good outcome but who is not achieving their potential in terms of learning and language development. We looked at a home intervention programme to address these issues in a small cohort of infants. Our research paper titled 'Therapeutic Listening for Preterm Children with Sensory Dysregulation, Attention and Cognitive Problems' was published in January 2020[3]. The research showed this home intervention programme to be a feasible intervention for preterm children to improve their attention levels and sensory processing skills. These skills, as we know, are very important for future learning and language development. We are continuing to research these issues so that we can get a better understanding of the needs of our preterm population in terms of attention and sensory processing skills.

We need to improve educational outcomes. Neurodevelopmental outcomes do not appear to be improving despite improved survival and

neonatal care. In a UK survey, carried out in 2020, more than 90% of 426 families reported that there should be more awareness and understanding of the educational needs of children born preterm. Impairments in speech and language impact negatively on academic learning and executive functioning skills during the school years. Recognising these challenges, the PRISM E–learning resource programme, consisting of 5 x1 hour sessions, with interactive multimedia content, has been devised for educational professionals in the UK.[4] The sessions examine preterm birth, educational outcomes, cognitive outcomes, behavioural outcomes and social and emotional outcomes. It outlines strategies to support children with inattention, working memory difficulties, slow processing speed, poor visuospatial skills, social and emotional problems and mathematics difficulties. There is a need to bridge the gap between healthcare and education to determine what support children and families need, to understand the factors that contribute to attainment after preterm birth and to develop and evaluate intervention programmes.

Our newly appointed neonatal Speech and Language Therapist (SLT) took up her post in November 2021. This recommendation was highlighted in the HSE Model of Care document and the NICE Guidelines.[1,2] A speech and language therapist working with parents during the neonatal period and for the first two years is now deemed an essential service for children born preterm. The support of an SLT is vital for children struggling with feeding or who present with speech and language delays. An SLT works with parents to initiate and develop their child's attention and listening skills, play skills, their comprehension and expression of language (combining words to make sentences), and their speech articulation, all which contribute to language development.

We know that preterm infants who have had early feeding problems are more likely to have language impairment, some with lasting effects into childhood and adolescence. Although preterm infants will not speak for a few years, elements of their care in the NICU may impact on their speaking ability over the long-term. Of our preterm group who were followed-up in 2020, 31% showed an expressive speech delay at least one standard deviation or more below the mean (score <85) while 21% had a receptive speech delay. The extent of language delay as a problem in preterm infants is often under-appreciated, as many centres, including ours, primarily report on composite cognitive and motor scores as opposed to language scores. Our data support the need for early speech and language therapy input commencing in the NICU.

Term infants with neonatal encephalopathy also have high rates of speech and language delay. In those infants with a normal brain MRI, the rate of speech and language delay is 27%. In those infants with an abnormal brain MRI, the rate of speech and language delay is 48%. In our small cohort of 19 infants assessed, 31% of infants who underwent therapeutic hypothermia demonstrated an expressive speech delay between 1 and 2 standard deviations below the mean and 19% showed receptive speech delay. One of these infants was fitted with bilateral hearing aids at 5 months of age and shows signs of gross motor delay. Inattention, poor sensory regulation and poor speech development was evident for the other cases. Of infants who did not undergo therapeutic hypothermia (n=7), none were found to have an expressive speech delay but 14% (n=1) showed a receptive speech delay.

Early identification of developmental delay is critical as early intervention is likely to be the most effective in decreasing impairment. We have just commenced 'developmental care' ward rounds (The ACORN Programme) in our NICU. We are in the process of developing a more comprehensive developmental assessment clinic post-discharge. This will improve the access our babies have to physiotherapy, SLT and dietetics, in the out-patient setting. With time, we aspire to offer the services of an occupational therapist.

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Neonatal Activity

Number of Admissions to the Neonatal Intensive Care Unit (NICU)

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number	1476	1823	1944	2083	1926	2090	1517	1579	1240	1243

Sources of Admission to the NICU

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
First admission for inborn infants	1205 (82%)	1612 (88%)	1720 (89%)	1809 (87%)	1703 (88%)	1907 (91%)	1341 (88%)	1417 (90%)	1107 (89%)	1059 (85%)
- Delivery Ward	382	649	644	729	715	780	915	950	772	783
- Theatre	497	532	603	629	590	629	Inc. above	Inc. above	Inc. above	Inc. above
- Postnatal Ward	326	430	473	451	399	498	426	467	335	276
First admission for Outborn infants	51 (3%)	62 (3%)	52 (3%)	48 (2%)	45 (2%)	55 (3%)	41 (3%)	38 (2%)	46 (4%)	60 (5%)
First admission from home	72 (5%)	69 (4%)	60 (3%)	91 (5%)	82 (4%)	67 (4%)	42 (3%)	38 (2%)	30 (2%)	59 (5%)
Readmission from postnatal ward	96 (7%)	34 (2%)	46 (2%)	60 (3%)	39 (2%)	30 (2%)	39 (3%)	41 (3%)	21 (2%)	15 (1%)
Readmission from other hospital	17 (1%)	19 (1%)	20 (1%)	27 (1%)	14 (1%)	12 (1%)	16 (1%)	21 (1%)	12 (1%)	14 (1%)
Readmission from home	35 (2%)	27 (2%)	46 (2%)	48 (2%)	43 (2%)	19 (1%)	38 (2%)	24 (2%)	24 (2%)	36 (3%)
Total	**1476 (100%)**	**1823 (100%)**	**1944 (100%)**	**2083 (100%)**	**1926 (100%)**	**2090 (100%)**	**1517 (100%)**	**1579 (100%)**	**1240 (100%)**	**1243 (100%)**

Clinical Reasons for First Admission of Inborn and Outborn Infants

Clinical Reason	2017		2018		2019		2020		2021	
Respiratory	426	22%	360	26%	517	36%	399	35%	394	35%
Prematurity	211	11%	207	15%	204	14%	259	22%	248	22%
Gastroenterology	293	15%	319	23%	306	21%	189	16%	109	10%
Suspected/Proven Infection	670	34%	185	13%	139	9%	77	7%	111	10%
Small for Dates	94	5%	95	7%	73	5%	63	5%	81	7%
Congenital Anomalies	29	1%	30	2%	42	3%	30	3%	37	3%
Cardiac	50	3%	44	3%	42	3%	32	3%	41	4%
Birth Depression	34	2%	13	1%	27	2%	17	1%	17	2%
Other Neurological	15	1%	11	1%	18	1%	12	1%	20	2%
Surgical	6	<1%	2	<1%	7	<1%	4	<1%	6	<1%
Haematological	33	2%	23	2%	28	2%	23	2%	14	1%
Other	101	5%	93	8%	52	4%	48	4%	41	4%
Total	**1962**	**100%**	**1382**	**100%**	**1455**	**100%**	**1153**	**100%**	**1119**	**100%**

Levels of Neonatal Care

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number of Intensive Care Days	1774	1647	1561	1397	1307	1664	1403	1289	1105	1295
Number of High Dependency Care Days	1972	2047	2499	2712	2813	3051	2916	3457	3134	3142
Number of Special Care Days	7274	7553	7557	7401	6423	7021	7644	6882	5822	5440

*British Association of Perinatal Medicine. Categories of Care 2011 (August 2011). http://www.bapm.org/publications/documents/guidelines/CatsofcarereportAug11.pdf

Outpatient Clinic Attendances

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Actual clinics	410	388	419	417	381	428	395	248	250	250
New patients (first visits)	2425	2632	1562	1537	1542	1894	2828	2835	1669	1827
Return visits	1952	1635	2740	2240	2372	2129	539	608	861	1332
Total visits	**4377**	**4267**	**4365**	**3777**	**3914**	**4023**	**3367**	**3443**	**2530**	**3159**

Summary of Infants reported to VON

	All Cases	Number of cases excluding congenital anomalies
Infants < 401g but ≥22 wks gestation	0	0
Infants 401-500g	4	4
Infants 501-1500g	115	109
Infants > 1500g but ≤29 wks gestation	2	2
Total	**121**	**115**

Survival Rate to Discharge of VLBW Infants reported to VON according to Gestational Age (n=121)

Gestational Age	Inborn Infants	Survival to Discharge	Outborn Infants	Survival to Discharge	Total Survival to Discharge
20 wks	0	0 (0%)	0	0 (0%)	0 (0%)
21 wks	1	0 (0%)	0	0 (0%)	0 (0%)
22 wks	1	0 (0%)	0	0 (0%)	0 (0%)
23 wks	9	0 (0%)	1	0 (0%)	0 (0%)
24 wks	12	6 (50%)	1	1 (100%)	7 (54%)
25 wks	9	5 (56%)	3	3 (100%)	8 (67%)
26 wks	13	12 (92%)	2	2 (100%)	14 (93%)
27 wks	10	6 (60%)	0	0 (0%)	6 (60%)
28 wks	9	5 (56%)	2	2 (100%)	7 (64%)
29 wks	10	10 (100%)	1	1 (100%)	11 (100%)
30 wks	10	10 (100%)	3	3 (100%)	13 (100%)
31 wks	5	5 (100%)	2	2 (100%)	7 (100%)
32 wks	9	8 (89%)	2	2 (100%)	10 (91%)
>32 wks	5	5 (100%)	1	1 (100%)	6 (100%)
Total	**103**	**72/103 (70%)**	**18**	**17/18 (94%)**	**89/121 (74%)**

Survival Rate to Discharge of VLBW Infants reported to VON according to Birthweight (n=121)

Birthweight	Inborn Infants	Suvival to Discharge	Outborn Infants	Survival to Discharge	Total Survival to Discharge
<501g	4	0 (0%)	0	0 (0%)	0 (0%)
501-600g	10	1 (10%)	1	0 (0%)	1 (9%)
601-700g	14	8 (57%)	1	1 (100%)	9 (60%)
701-800g	16	10 (63%)	1	1 (100%)	11 (65%)
801-900g	4	3 (75%)	0	0 (100%)	3 (75%)
901-1000g	6	6 (100%)	3	3 (100%)	9 (100%)
1001-1100g	6	5 (83%)	1	1 (100%)	6 (86%)
1101-1200g	9	7 (78%)	2	2 (100%)	9 (82%)
1201-1300g	8	7 (88%)	0	0 (0%)	7 (88%)
1301-1400g	14	14 (100%)	3	3 (100%)	17 (100%)
1401-1500g	11	10 (91%)	5	5 (100%)	15 (94%)
>1500g	1	1 (100%)	1	1 (100%)	2 (100%)
Total	**103**	**72/103 (70%)**	**18**	**17/18 (94%)**	**89/121 (74%)**

Perinatal, Neonatal & Infant Mortality

Perinatal Mortality: Congenital Anomalies – Livebirths (9)

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External Referral	IUGR	Placental Histology	Cause of death	PM
1	27+3	1105	Male	Sponta-neous breech with MSV	n/r	1	DR Death	No	No	DCH.	Trisomy 21, Bilateral Hydrothoraces, Complications of Prematurity, VLBW.	No
2	32+2	1410	Female	Sponta-neous vaginal	6,8	5	NICU	Yes	Yes-syndrome	Low grade FVM, velamentous cord.	Complex Congenital Heart Disease with Pulmonary valve Atresia secondary to two de-novo Microdeletions in Chr 22 and 17 (Di-George Syndrome and Miller -Dieker Syndrome).	No
3	33+5	2470	Male	Sponta-neous vaginal	5,7	1	DR Death	No	No	Gross only – normal.	Jouberts Syndrome (X linked OFD1 mutation).	No
4	34+2	2412	Female	C-Section	n/r	1	DR Death	No	No	Gross only – normal.	Thanatophoric Dysplasia.	No
5	36+1	3170	Male	C-Section	n/r	6	NICU	No	No	MVM.	Noonan's Syndrome, Severe Hydrops Fetalis with Multi-Organ Failure.	No
6	38+0	2035	Female	C-Section	4,4,4	2	DR Death	No	Yes	SUA.	Trisomy 18.	No
7	38+5	2900	Male	Sponta-neous vaginal	2,10	3	NICU	No	No	Low grade villitis.	Respiratory Failure secondary to lethal renal anomaly (Polycystic Kidney Disease-Autosomal Recessive PKHD 1 genetic mutation).	No
8	38+5	3880	Male	C-Section	5,6	3	NICU	Yes	No	Gross only – normal.	Apert's Syndrome with HLHS, Craniosynostosis, B/L Choanal atresia, mitten hands and severe syndactyly of both feet.	No
9	39+1	3120	Male	C-Section	7,8,9	6	Paediatric Hospital	Yes	No	Hypercoiled cord and chorangiosis.	Emmanuel Syndrome with Complex CHD-Tetrology of Fallot with Supracardiac TAPVD.	No

Perinatal Mortality: Congenital Anomalies – Stillbirths (10)

Case No.	EGA	BW (gms)	Gender	Delivery method	External Referral	IUGR	Placental Histology	Cause of death	PM
1	23+4	640	Male	Spontaneous vaginal	No	No	No abnormal histology.	Anomalies.	No
2	23+5	670	Male	Spontaneous vaginal	No	No	No placenta available.	Anomalies.	Yes
3	23+6	645	Male	Spontaneous vaginal	No	No	No placenta available.	Anomalies.	No
4	25+0	775	Male	Spontaneous breech with MSV	No	No	No abnormal histology.	Anomalies.	No
5	25+4	755	Male	Spontaneous vaginal	No	No	No placenta available.	Anomalies.	No
6	28+5	730	Male	Spontaneous vaginal	No	Yes	High grade FVM and velamentous cord.	Placental disease with duodenal atresia.	Yes
7	34+1	1505	Female	C-Section	No	Yes	High grade FVM.	Cardiac anomaly.	Yes
8	30+0	1280	Male	Spontaneous vaginal	No	No	Hypercoiled cord.	Fetal hydrops.	No
9	34+3	1300	Male	Spontaneous breech with MSV	No	Yes - syndrome	Hypercoiled cord. High grade FVM with DVM.	Trisomy 18.	No
10	38+2	2405	Male	Spontaneous breech with MSV	No	No	High grade FVM.	Cord accident in an abnormally formed infant with major renal and cardiac anomalies.	Yes

Perinatal Mortality: Antepartum Stillbirths (27)

Case No.	EGA	BW (gms)	Gender	Delivery method	External Referral	IUGR	Placental Histology	Cause of death	PM
1	22+2	510	Male	Spontaneous vaginal	No	No	MIR and FIR.	Ascending infection.	No
2	23+5	565	Female	Spontaneous vaginal	Yes	No	MIR and FIR; hypercoiled cord; DCH.	Ascending infection.	No
3	24+2	530	Male	Spontaneous breech with MSV	No	No	Massive subchorial haematoma.	Placental disease.	No
4	24+2	720	Male	Spontaneous vaginal	No	No	Hypercoiled cord with stricture. High grade FVM.	Placental disease.	No
5	24+4	440	Male	Spontaneous breech with MSV	No	Yes - TTTS	MCDA.	TTTS.	No
6	24+4	525	Male	Spontaneous breech with MSV	No	No	MIR and FIR. Velamentous cord with high grade FVM.	Ascending Infection.	No
7	24+4	550	Male	Spontaneous vaginal	No	No	MCDA.	TTTS.	No
8	24+5	540	Male	Spontaneous vaginal	No	No	Hypercoiled cord. High grade FVM and severe MVM.	Placental disease.	No
9	25+3	850	Male	C-Section	Yes	No	Velamentous cord and MVM.	TTTS.	No
10	26+4	900	Male	Spontaneous vaginal	No	No	MIR and FIR. High grade FVM.	Ascending infection.	No
11	28+1	675	Female	Spontaneous breech with MSV	No	Yes	Hypercoiled cord with strictures. High grade FVM.	Cord hypercoiling with strictures.	No
12	28+4	685	Male	Spontaneous vaginal	Yes	Yes	SUA. MIR and FIR.	Ascending Infection.	Yes
13	29+5	1730	Male	Spontaneous vaginal	No	No	Cord stricture. High grade FVM.	Placental disease.	No
14	31+5	1630	Male	Spontaneous vaginal	No	No	Retroplacental haemorrhage with mild MVM.	Abruption.	No
15	32+0	1485	Female	Spontaneous breech with MSV	No	No	Hypercoiled cord. High grade FVM.	Hypercoiled cord.	No
16	33+0	2070	Male	Spontaneous vaginal	No	No	SUA. High grade FVM. Raised nucleated blood cells.	Placental disease. High grade FVM.	Yes
17	33+3	2300	Male	Spontaneous breech with MSV	No	No	Normal histology. Raised nucelated red cells.	Ruptured splenic artery aneurysm.	No
18	35+1	2450	Female	Spontaneous vaginal	No	No	Covid Placentitis.	Covid Placentitis.	Yes
19	35+5	1884	Female	Spontaneous vaginal	No	Yes	Hypercoiled cord. MVM.	Cord hypercoiling (FVM).	No
20	35+6	100	Male	C-Section	Yes	n/a	MCDA.	Unexplained.	No

Case No.	EGA	BW (gms)	Gender	Delivery method	External Referral	IUGR	Placental Histology	Cause of death	PM
21	37+1	1350	Female	C-Section	No	Yes	Hypercoiled with strictures and umbilical arterial thrombosis.	Placental disease.	No
22	37+4	2940	Female	Spontaneous vaginal	No	No	Tight true knot with stricture. High grade FVM.	Cord pathology.	No
23	38+0	2910	Male	Spontaneous vaginal	No	No	Long cord (123 cm). Hypercoiled with tight knot. Low grade FVM with DVM.	Cord pathology.	No
24	39+0	3410	Female	C-Section	No	No	Delayed villous maturation.	Placental disease.	Yes
25	40+1	2995	Female	Spontaneous vaginal	No	No	Hypercoiled cord.		Coroner's PM
26	40+6	3115	Female	Spontaneous vaginal	No	No	High grade FVM with meconium associated vascular necrosis.	Placental disease.	Yes
27	42+1	3655	Male	Spontaneous vaginal	No	No	High grade villitis with stem vessel obliteration. Moderate MVM.		Coroner's PM

Perinatal Mortality: Early Neonatal Deaths (18)

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External Referral	IUGR	Placental His-tology	Cause of death	PM
1	21+3	545	Male	Sponta-neous vaginal	2,1	1	DR Death	No	No	MVM with RPH.	Preterm labour, pre-viable gestation.	No
2	23+2	640	Male	Sponta-neous vaginal	5,6,7	5	NICU	Yes	No	MIR and FIR with RPH. High grade FVM.	Extreme Prematurity, ELBW, Severe Respiratory failure secondary to Rt sided Tension Pneumothorax.	No
3	23+4	595	Female	Sponta-neous breech with MSV	2,3,5	3	NICU	No	No	MIR and FIR.	Early onset E.Coli Sepsis.	No
4	23+4	600	Female	Sponta-neous vaginal	8,8	3	NICU	No	No	MIR, no FIR. Hypercoiled cord. DCH.	Extreme Prematurity, ELBW, Pulmonary Haemorrhage.	No
5	23+4	610	Female	Sponta-neous vaginal	5,3,4	1	DR Death	Yes	No	MIR and FIR. Mild MVM.	Extreme Prematurity, ELBW.	No
6	23+6	550	Female	Sponta-neous vaginal	n/r	1	DR Death	Yes	No	Ascending infection.	Complications of Extreme Prematurity, ELBW.	No
7	23+6	590	Male	Sponta-neous breech with MSV	n/r	5	NICU	Yes	No	Ascending infection.	Complications of Extreme Prematurity, ELBW.	No
8	24+1	610	Female	Sponta-neous vaginal	7,5,8	5	NICU	No	No	DCDA. No abnormal histology reported.	E.coli septicaemia with Pulmonary Thromboembolism and Pulmonary Haemorrhage, Extreme Prematurity, ELBW.	Yes
9	24+1	620	Female	Sponta-neous vaginal	6,0,0	1	DR Death	No	No	Low grade FVM and mild MVM.	Complications of Extreme Prematurity, ELBW.	No
10	24+1	695	Female	Sponta-neous vaginal	6,8	3	NICU	No	No	Low grade FVM and mild MVM.	Acute Pulmonary Haemorrhage, Severe RDS, Evolving PIE, Extreme Prematurity, ELBW, Severe Hypotension and Bilateral IVH.	No
11	24+1	745	Male	Sponta-neous vaginal	7,8,8	5	NICU	No	No	Dichorionic placenta with Acute Chorionitis in Twin B.	Early onset E.Coli Sepsis, Extreme Prematurity, ELBW.	No
12	24+4	800	Male	C-Section	4,7	7	Paediatric Hospital	Yes	No	Hypercoiled cord. Mild MVM.	Necrotising Enterocolitis, Complications of Extreme Prematurity, ELBW	No

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External Referral	IUGR	Placental Histology	Cause of death	PM
13	25+0	615	Male	Spontaneous breech with MSV	3,4,4	1	NICU	No	No	MIR and FIR.	Extreme Prematurity, ELBW, Severe RDS, Rt sided Pneumothorax, Pneumomediastinum and Pneumoperitoneum due to Gastric perforation.	No
14	25+1	805	Male	Spontaneous vaginal	8,8	7	NICU	Yes	No	MIR and FIR.	Complications of Extreme Prematurity, ELBW, Parenteral Nutrition Acute Extavasation, Liver Injury, Rt Grade 4 and Left Grade 3 IVH.	Yes, Coroner's PM
15	25+3	715	Male	C-Section	2,5,7	1	NICU	No	No	MVM.	Complcations of Extreme Prematurity, ELBW and Severe Anaemia, Pericardial Effusion and Cardiac Failure due to triplet to triplet transfusion.	No
16	25+3	715	Male	C-Section	2,5,9	2	NICU	No	No	MVM.	Complcations of Extreme Prematurity, ELBW, Disseminated Intravascular Coagulopathy (DIC), Multi-organ Failure, Rt. Grade 4 IVH.	No
17	32+0	1535	Female	C-Section	7,7	5	NICU	Yes	No	Moderate MVM and low grade FVM.		Yes, Coroner's PM
18	40+2	3450	Female	C-Section	0,0,0	3	NICU	No	No	Covid placentitis..		Yes, Coroner's PM

Late Neonatal Deaths (12) and Early Infant Deaths (4) Including Congenital Anomalies

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External Referral	IUGR	Placental Histology	Cause of death	PM
1	23+1	550	Male	Spontaneous vaginal	1,2,4	15	NICU	No	No	MIR and FIR.	Necrotising Enterocolitis, Bacterial Sepsis, Extreme Prematurity, ELBW.	No
2	24+0	770	Male	C-Section	8,9	38	NICU	No	No	MIR and FIR.	Complications of Extreme Prematurity, ELBW, Evolving Severe Chronic Lung Disease.	No
3	26+1	600	Female	C-Section	2,4	8	NICU	No	Yes - TTTS	MCDA. Features of TTTS.	Extreme Prematurity, ELBW , Severe Anaemia due to TTTS and Early Onset Staphylococcus. Sepsis.	No
4	27+0	560	Male	C-Section	3,7	10	Paediatric Hospital	Yes	Yes	Gross only - normal	Necrotising Enterocolitis, Complications of Prematurity, ELBW.	No
5	27+2	570	Female	C-Section	8,8	10	NICU	No	Yes	High grade FVM with DVM. Hypercoiled cord.	Complcations of Extreme Prematurity, ELBW, IUGR, Late Onset Staph. Aureus Sepsis.	Yes

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External Referral	IUGR	Placental His-tology	Cause of death	PM
6	27+5	755	Female	C-Section	6,6,8	16	NICU	No	Yes	RPH. Hypercoiled cord. Mild MVM.	Necrotising Enterocolitis, Complications of Extreme Prematurity, ELBW.	No
7	28+2	1035	Female	C-Section	5,5,8	18	NICU	Yes	No	Hydropic.	Non- Immune Hydrops Fetalis, Complications of Extreme Prematurity, ELBW.	No
8	28+3	1285	Female	C-Section	9,9	21	NICU	No	No	Decidual necrosis.	Lung Disease of Prematurity, Staph. Aureus Sepsis, Complications of Extreme Prematurity, ELBW.	No
9	28+4	470	Female	C-Section	9,10,10	29	NICU	No	Yes	Severe MVM and low grade FVM.	Necrotising Enterocolitis, Enterococcus Sepsis, Complications of Extreme Prematurity, ELBW.	No
10	28+6	1200	Male	Sponta-neous breech with MSV	3,7,9	9	NICU	Yes	No	No abnormal histology reported.	Ischaemic Brain Injury, Severe Pulmonary Hypertension, Complications of Extreme Prematurity, ELBW.	No
11	30+4	1545	Female	C-Section	6,7,8	28	Paediatric Hospital	No	No	MIR, no FIR. DCH. SUA.	Congenital Neutropenia with Progressive Pancytopenia of Unknown Cause.	No
12	30+5	1690	Female	C-Section	4,7	26	Paediatric Hospital	Yes	No	Placenta accreta.	Necrotising Enterocolitis, Complications of Prematurity, LBW	No
13	36+6	3050	Male	Sponta-neous vaginal	5,6,8	25	Paediatric Hospital	Yes	No	Gross only – normal.	Epstein Anomaly with severe tricuspid incompetence, Multi-factorial Shock, medical NEC, Post -op Staph. Epidermidis Mediastinitis.	No
14	37+1	3750	Female	Sponta-neous vaginal	5,8	13	Paediatric Hospital	Yes	No	Long cord.	Beckwith Wiedemann Syndrome, Omphalocele, Post -Op NEC.	No
15	38+0	3270	Female	Sponta-neous vaginal	7,9	184	Paediatric Hospital	No	No	Not performed.	Trisomy 21, s/p AVSD repair and PDA Ligation, Out of Hospital Cardiac Arrest.	No
16	39+1	3090	Male	C-Section	8,6	132	Home	No	No	Hypercoiled cord. High grade FVM with chorangiosis.	PERCHING Syndrome. (Autosomal recessive multisystem disorder)	No

Liveborn Babies <500g and <24 wks gestation (5)

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External Referral	IUGR	Placental Histology	Cause of death	PM
1	21+0	350	Male	Sponta-neous vaginal	1,1	1	DR Death	No	No	MIR and FIR.	Preterm labour, pre-viable gestation.	No
2	21+2	356	Male	Sponta-neous vaginal	5,1	1	DR Death	No	No	MIR and FIR.	Preterm labour, pre-viable gestation.	No
3	22+6	410	Female	Sponta-neous vaginal	1,1,1	1	DR Death	Yes	No	MIR and FIR. Hypercoiled cord.	PPROM, Preterm labour, pre-viable gestation.	No
4	23+1	480	Female	Sponta-neous vaginal	3,0	1	DR Death	Yes	No	MIR and FIR.	Preterm labour, Extreme Prematurity peri-viable gestation.	No
5	23+1	485	Female	C-Section	5,6,6	2	NICU	Yes	No	MIR and FIR.	Extreme Prematurity, ELBW,Severe Pulmonary Haemorrhage.	No

Outborn Deaths (2)

Case No.	EGA	BW (gms)	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	Placental Histology	Cause of death	PM
1	23+0	535	Female	C-Section	3,3,5	5	NICU	Not avail-able.	Extreme Prematurity, ELBW, Pulmonary Haemorrhage, Left Grade 4 IVH.	No
2	32+2	1755	Female	C-Section	9,10	86	Hospice	Not avail-able.	Enterococcus Cloacae Meningitis causing Severe Brain Injury and Post -Men-ingitic Hydrocephalus.	No

T Yee Khong, EE Mooney, PGJ Nikkels, TK Morgan, SJ Gordijn, eds: Pathology of the Placenta: a Practical Guide. Springer Nature Switzerland 2019. ISBN 978-3-319-97213-8

Neonatal Encephalopathy

Since 2013, NMH now reports on all infants ≥35 weeks gestation who during the first week of life have:

- Either seizures alone

or

- Signs of Neonatal Encephalopathy which is defined as clinical findings in 3 or more of the following domains:
- Level of consciousness
- Spontaneous activity when awake or aroused
- Posture
- Tone
- Primitive reflexes
- Automonic system

For a more detailed description of the findings in each domain, please refer to the appendix. To be included in our annual figures, the signs of neonatal encephalopathy (whether mild, moderate or severe) must be present for at least 24 hrs.

Cases reported are reviewed and some are subsequently reclassified as Hypoxic-Ischaemic Encephalopathy if there is clinical evidence of encephalopathy (as defined above) associated with one or more of the following physiological criteria:

- Apgar score ≤5 at 10 mins of age
- Continued need for resuscitation (endotracheal intubation or PPV) at 10 mins after birth.
- Acidosis within 60 mins of birth (defined as a pH < 7.0 in an umbilical cord or any neonatal arterial, venous or capillary blood sample)
- Base deficit ≥ 16 mmol/L in an umbilical cord or any neonatal blood sample (arterial, venous or capillary) within 60 mins of birth

Reference is also made to which cases undergo therapeutic hypothermia. Please note that the physiological criteria which are now used to reclassify a case as HIE are broader than the criteria applied in previous years. If pertinent obstetric details surrounding the delivery are not available (as in the case of outborn infants) to allow a case to be catergorised as HIE according to the above definition, then, the case, by default, is reported as a case of Neonatal Encephalopathy. In all reported cases, it is assumed that there is no evidence of an infectious cause, a congenital malformation of the brain or an inborn error of metabolism that could explain the encephalopathy.

All cases (both neonatal encephalopathy cases and hypoxic-ischaemic encephalopathy cases) are further categorised according to severity of presentation. The most severe stage observed during the first 7 days following birth is recorded based on the infant's level of consciousness and response to arousal manoeuvres such as persistent gentle shaking, shining a light or ringing of a bell. Infants are considered to fall into the 'mild' category if they are alert or hyperalert with either a normal or exaggerated response to arousal, infants fall into the 'moderate' category if they are arousable but are lethargic and have a diminished response to arousal manoeuvres and infants fall into the 'severe' category if they are stuporous or comatosed and are difficult to arouse or are not arousable. If further clarification regarding any of these clinical terms or definitions is required, please refer to the appendix.

Since 2017, infants who have seizures but who are not clinically encephalopathic are no longer included in the neonatal encephalopathy figures as before; they will now be listed separately.

No. of Cases 2021

	Inborns	Outborns
Hypoxic Ischaemic Encephalopaty	6	2
• Mild HIE (Grade 1)	0	0
• Moderate HIE (Grade 2)	5	2
• Severe HIE (Grade 3)	1	0
Neonatal Encephalopathy	0	3
Seizures – No Encephalopathy	2	2
Therapeutic Hypothermia	6	5

Infants Undergoing Therapeutic Hypothermia in NMH

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Inborn										
HIE cases reported	10	12	9	19	9	9	9	5	8	6
Number cooled	10	11	9	18	9	9	9	5	8	6
NE cases reported	19	7	4	2	5	2	4	0	0	0
Number cooled	7	3	0	*2*	*2*	2	*4*	0	0	0
Total	**29 (17 cooled)**	**19 (14 cooled)**	**13 (9 cooled)**	**21 (20 cooled)**	**14 (11 cooled)**	**11 (11 cooled)**	**13 (13 cooled)**	**5 (5 cooled)**	**8 (8 cooled)**	**6 (6 cooled)**
Outborn										
HIE cases reported	8	8	13	8	6	10	2	6	4	2
Number cooled	7	7	12	8	5	9	2	6	4	2
NE cases reported	2	4	1	1	1	1	0	2	2	3
Number cooled	1	2	0	1	1	1	0	1	1	3
Total	**10 (8 cooled)**	**12 (9 cooled)**	**14 (12 cooled)**	**9 (9 cooled)**	**7 (6 cooled)**	**11 (10 cooled)**	**2 (2 cooled)**	**8 (7 cooled)**	**6 (5 cooled)**	**5 (5 cooled)**
Total Inborn and Outborn Cases	39	31	27	30	21	22	15	13	14	11
Total receiving Therapeutic Hypothermia										
Inborn infants cooled	17	14	9	20	11	11	13	5	8	6
Outborn infants cooled	8	9	12	9	6~	10	2	7	5	5
Total	**25**	**23**	**21***	**29^**	**17~**	**21~**	**15**	**12∞**	**13**	**11**

** 2 other inborn infants were cooled in 2014 but are excluded from the above table as both of these infants were diagnosed with early onset neonatal sepsis.*

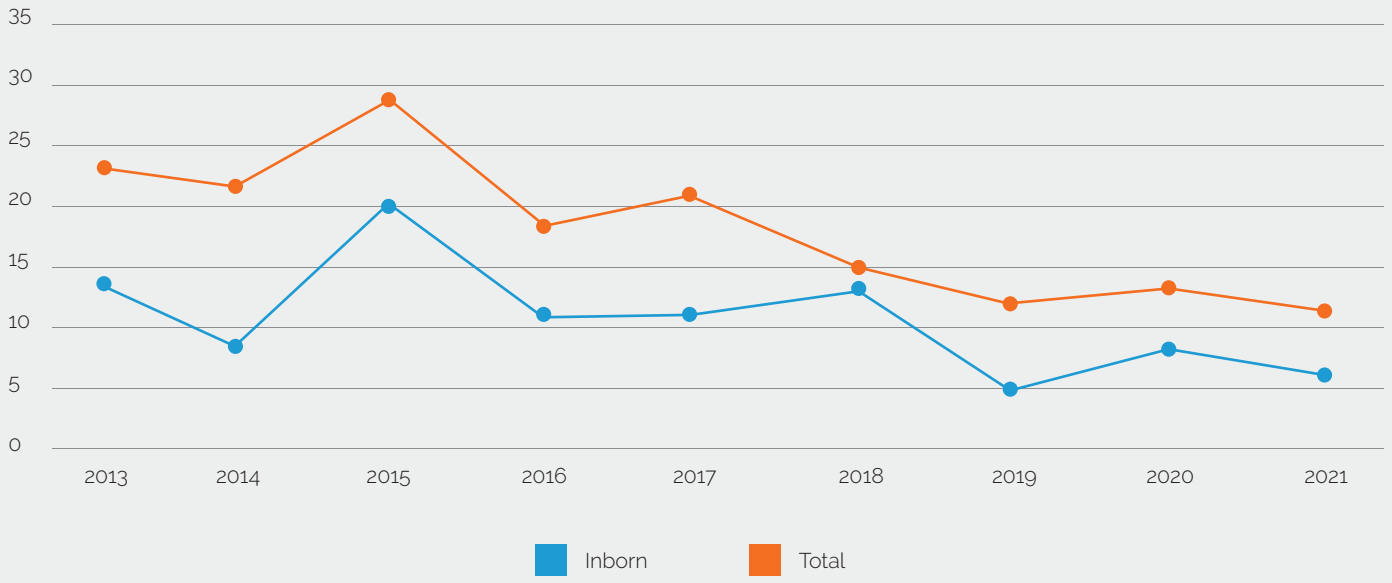
^one outborn infant was cooled in 2015 but is excluded from the above table as the infant was diagnosed with a congenitally acquired condition postnatally.

~ one infant is not included in the hypothermia figures as although the infant was initially commended on cooling, it was discontinued as it was not tolerated.

∞one inborn infant was cooled in 2019 but is excluded from the above table as the infant was diagnosed with early onset neonatal sepsis.

Please note as of 2017, infants who have seizures but who are not clinically encephalopathic are excluded from the above table.

Infants Undergoing Therapeutic Hypothermia in the NMH 2013-2021



	2013	2014	2015	2016	2017	2018	2019	2020	2021
Inborn	14	9	20	11	11	13	5	8	6
Total	**23**	**21**	**29**	**17**	**21**	**15**	**12**	**13**	**11**

Hypoxic Ischaemic Encephalopathy: Inborn (6)

Case No.	EGA	BW (g)	Delivery Method	Delivery Method Indication	Apgars 1, 5, 10, 15, 20	PPV at 10 mins	Min pH within 60 min	Max BE within 60 min	Seizures Y/N	TH	Grade of NE	Summary of MRI brain	Organ Involvement	Outcome	Placental Histology	Classification
1	37+6	3255	Emergency C-Section (not in labour)	NRCTG	7,8	No	6.8	incalculable	Yes	Yes	2	Normal	Ventilated, coagulopathy, AKI, increased LFTs, SIADH	Discharged home on DOL 7	Normal	3, 4 HIE inborn
2	40+1	3430	SVD	Meconium stained liquor	9,9	No	6.8	incalculable	Yes	Yes	2	Normal	Ventilated, Severe PPHN (ECMO), inotropes	Transferred for ECMO DOL 4, Readmitted DOL 11, Discharged home DOL 33	Acute chorioamnionitis, delayed villous maturation with low grade FVM, hypocoiled cord	3, 4 HIE inborn
3	40+1	3840	Emergency C-Section (not in labour)	Reduced fetal movements, NRCTG	2,6,8	No	6.8	incalculable	Yes	Yes	2	Normal	Ventilated, PHHN, inotropes, thrombocytopenia, anaemia, AKI, elevated LFTs, SIADH, subcutaneous fat necrosis, hypercalcaemia, bilateral uveitis	Discharged home DOL 28, Readmitted DOL 33 for hypercalcaemia. Transferred to children's hospital on DOL 52	Low grade FVM and mild MVM	3,4 HIE inborn
4	40+2	3450	Emergency C-Section (in labour)	NRCTG, Meconium stained liquor, COVID positive	0,0,0	Yes	6.8	incalculable	Yes	Yes	3	Not performed (CRUSS: increased parenchymal echogenicity diffusely)	Ventilated, thrombocytopenia, AKI, raised LFTs, SIADH	Died DOL 4, Coroner's case	Extensive COVID placentitis (>90%)	1,2,3,4 HIE inborn
5	40+3	3580	Emergency C-Section (not in labour)	Absent fetal movements, fetal bradycardia, feto-maternal haemorrhage	2,4,4	No	7.19	-11.4	Yes	Yes	2	Abnormal- Watershed pattern of ischaemia/ infarction	Ventilated, inotropes, anaemia, coagulopathy, AKI, increased LFTs, SIADH	Discharge home on DOL 12	Features of subacute/ chronic anaemia	1 HIE inborn
6	41+5	4750	Operative vaginal (ventouse)	IOL for post dates, shoulder dystocia	0,4,4	Yes	7.12	-11.5	No	Yes	2	Abnormal- Bilateral thalamic pattern of ischaemia/ infarction	Ventilated, raised LFTs, fat necrosis, SIADH	Discharged home on DOL 8	Delayed villous maturation with high grade FVM	1, 2, HIE inborn

Neonatal Encephalopathy: Inborn (0)

No cases to report

Classification:

1) Apgar score ≤5 at 10 mins of age
2) Continued need for resus at 10 mins after birth
3) pH <7.0 within 60 mins of birth
4) Base excess ≥ 16.0 within 60 mins of birth

Hypoxic Ischaemic Encephalopathy: Outborn (2)

Case No.	EGA	BW (g)	Delivery Method	Delivery Method Indication	Apgars 1, 5, 10, 15, 20	PPV at 10 mins	Min pH within 60 min	Max BE within 60 min	Seizures Y/N	TH	Grade of NE	Summary of MRI brain	Organ Involvement	Outcome	Placental Histology	Classification
1	41+0	2710	SVD	Reduced fetal movments, NRCTG	4,5,7,10	Yes	7.1	-13.4	No	Yes	2	Normal	Ventilated	Discharged home DOL 7	No placenta in NMH	2 HIE outborn
2	41+6	4245	Operative vaginal (forceps)	Forceps delivery for failure to progress and NRCTG, Shoulder dystocia	1,4,6	Yes	7.26	-10.8	Yes	Yes	2	Normal	Ventilated, raised LFTs, fat necrosis, SIADH	Discharged home DOL 6	No placenta in NMH	2, HIE outborn

Neonatal Encephalopathy: Outborn (3)

Case No.	EGA	BW (g)	Delivery Method	Delivery Method Indication	Apgars 1, 5, 10, 20 mins	PPV at 10 mins	Min pH within 60 mins	Max BE within 60 mins	Seizures Y/N	TH	Grade of NE	Summary of MRI brain	Organ Involvement	Outcome	Placental Histology	Classification
1	38+0	4415	SVD	Shoulder dystocia	0,6,9	No	7.24	-2.4	Yes	Yes	2	Normal	Ventilated, thrombocytopenia, SIADH	Transferred back to referring hospital DOL 12	No placenta in NMH	No indicators of HIE so classified as NE with seizures - outborn
2	39+6	3960	Operative vaginal (Ventouse)	Failure to progress	8,6,5	No	7.02	-14.5	Yes	Yes	2	Small extra-axial and intraventricular haemorrhages. Normal parenchyma	Ventilated, coagulopathy, thrombocytopenia, anaemia, SIADH	Transferred back to referring hospital DOL 16	Acute chorioamnionitis, hypercoiled cord, low grade FVM	No indicators of HIE so classified as NE with seizures - outborn
3	40+6	3380	Operative vaginal (ventouse)	IOL for reduced fetal movements	8,9,9	No	7.22	-7.2	Yes	Yes	2	Abnormal-global pattern of ischaemia/ infarction with superimposed ischaemia secondary to right internal carotid occlusion	None	Transferred back to referring hospital DOL 10	No placenta in NMH	No indicators of HIE so classified as NE with seizures secondary to neonatal stroke -outborn

Seizures – No Encephalopathy: Inborn (2)

Case No.	EGA	BW (g)	Delivery Method	Delivery Method Indication	Apgars 1, 5, 10, 15, 20	PPV at 10 mins	Min pH within 60 min	Max BE within 60 min	Seizures Y/N	TH	Grade of NE	Summary of MRI brain	Organ Involvement	Outcome	Histology	Classification
1	40+4	2950	Operative vaginal (ventouse then forceps)	IOL for oligohydramnios	5,7	No	N/A	N/A	Yes	No	0	Focal areas of ischaemic change noted bilaterally. Small bilateral subdural haemorrhages.	No	Discharged home DOL 17	High grade villitis with intervillositis	Seizure secondary to neonatal stroke, diagnosis of skeletal dysplasia (hypochondroplasia FGFR3 mutation) no HIE/NE
2	42+0	3335	SVD	IOL for post dates	2,5,9	No	6.93	-14.8	Yes	No	0	Normal	SIADH	Discharged home DOL 7	acute chorioamnionitis, small placenta, superficial implantation, low grade FVM	Seizure no HIE/NE

Seizures – No Encephalopathy: Outborn (2)

Case No.	EGA	BW (g)	Delivery Method	Delivery Method Indication	Apgars 1, 5, 10, 15, 20	PPV at 10 mins	Min pH within 60 min	Max BE within 60 min	Seizures Y/N	TH	Grade of NE	Summary of MRI brain	Organ Involvement	Outcome	Histology	Classification
1	39+4	3170	Elective C-Section	Breech. Retro-placental clot and antepartum haemorrhage	0,0,8	No	7.16	-4.4	Yes	No	1	Abnormal - abnormal frontal sulcal gyral pattern with white volume loss (possible neuronal migration disorder)	No	Discharged home on DOL 33	No placenta in NMH	Seizure secondary to genetic syndrome (dysmorphic likely Schinzel-Giedion syndrome, under investigation)
2	40+1	3260	SVD	Late decelerationss noted on CTG	9,9	No	N/A	N/A	Yes	No	0	Normal	No	Transferred back to referring hospital DOL 12	No placenta in NMH	Seizure no HIE/NE (MAS, PPHN)

Antenatal Education

Childbirth/antenatal education aims to equip pregnant women and their partners with the skills and knowledge to navigate through pregnancy and prepare themselves for childbirth and early parenthood. It aims to support and promote wellbeing and self-sufficiency in pregnancy and beyond.

The COVID-19 pandemic prompted a move away from the traditional structured, classroom format; however, the online model during the pandemic has proved very successful and has provided an opportunity to develop a more flexible, responsive programme. All classes are currently still online with the exception of individual classes and 'Young mums/teens'. It is anticipated that eventually a blended approach will be adopted which will allow for face to face and /or virtual classes. The ongoing aim is to continue to develop classes and resources which reflect the changing needs of women and partners.

A multidisciplinary team is involved in developing and delivering the antenatal education programmes. This team includes midwives, physiotherapists, dietitians, pharmacists; and we work closely with the wider multidisciplinary team for example mental health, medical social workers.

Attendance at all online classes increased significantly during the pandemic and this trend continues. 74% (54% pre pandemic) of primiparous and 17% (10% pre pandemic) of multiparous attended in 2021. Evaluation of the interactive online classes is very positive.

The COVID-19 pandemic has undoubtedly led to increased levels of anxiety in society and this is noticeable in those attending the classes. This has led to a significant increase in emails with queries or seeking supports which necessitate follow up and are part of the 'unseen' work in the department.

December 2021 also saw the retirement of our friend and colleague Margaret Fanagan after many years of passionate and dedicated service to the Antenatal Education Department. Her philosophy of always putting the woman at the centre of care means that she will be remembered fondly by many.

The classes available are as follows –

- Early Pregnancy Class: facilitated by a midwife, physiotherapist, dietitian and pharmacist. The focus is on laying the foundation for wellbeing in pregnancy and beyond. This class is held once a month.
- Preparation for Labour and Childbirth: for first time parents, held twice a week.
- Babycare and Postnatal Class: This is held the same afternoon to facilitate those who prefer to do their classes over one day. This class is open to both pregnant and postnatal women/partners.
- Refresher Class: this is run three times a month for those who have had previous normal births.
- VBAC Class: run twice a month for those who have had previous a caesarean section.
- Preparing for Elective Caesarean Section: classes are run once a month. This class is designed for the woman/partner where a caesarean section has been planned or is likely.
- Twin classes are run monthly.
- Young Mums/Teens classes are run monthly.

Introduction to Hypnobirthing: this class was introduced in 2021 and has proved very popular and is held monthly.

Individual session for vulnerable women and partners.

A class specifically for partners is being piloted and a postnatal 'drop in' webinar will be trialled shortly.

Margaret Fanagan who retired from the NMH after many years of dedicated service.

Bereavement

The vast majority of babies at the NMH are born healthy and well, but we are acutely aware of the great tragedy associated with the death of a baby, whatever the circumstance. Over the past number of years, we have been working to develop a comprehensive holistic service for bereaved families attending The National Maternity Hospital (NMH).

The Bereavement Midwives at the NMH care for women who experience 1st trimester loss, stillbirth or neonatal death and couples who have Termination of Pregnancy in the case of life limiting conditions or maternal interest. Central to the running of the service are the Clinical Midwife Specialists (CMS) in Bereavement, Brenda Casey, Sarah Cullen, Debbie Tarleton Bereavement Midwife (CMM1) and Katarzyna Sobczyk Bereavement Midwife (CMM1) who co-ordinate bereavement care for women, their partners and families. Arrangements are made for follow-up in specialised miscarriage and stillbirth clinics which are run by the Bereavement Midwives, senior medical personnel, special interest nurses and midwives.

There are four bereavement clinics led by Consultant Obstetrician & Gynaecologists: Dr Stephen Carroll met with 22 couples in the Stillbirth Clinic in 2021. 29 couples attended the late miscarriage clinic with Dr Cathy Allen. Follow up was also arranged with individual consultants for a further 34 couples with a significant amount of time invested in organising time frames for those that require joint obstetric and paediatric appointments. The recurrent miscarriage clinic remains busy with a high demand for appointments. 88 couples were investigated in the Recurrent Miscarriage clinic led by Dr Cathy Allen with input from Dr Sam Doyle (Consultant Clinical and Biochemical Geneticist) where necessary. A new clinic aimed at increased 1st trimester support and care in pregnancies following recurrent miscarriage ("TLC clinic") continued in 2021 and had 62 women attend with 124 surveillance scans performed. 23 couples were counselled in the preterm bereavement follow up clinic and a comprehensive plan was put in place for future pregnancies, this was facilitated by Dr Siobhan Corcoran/Dr Clare O'Connor and the Bereavement team.

These clinics provide an opportunity to determine how parents are coping with grief and loss and if further support is required. Medical information, obtained through investigations including haematological, microbiological, sonographic, radiological and histology is shared. The MRI scanner at the Hospital assists in this specialised area and images are reviewed by Dr Gabrielle Colleran, Consultant Radiologist. Clinics are supported by Consultant Pathologists Drs Paul Downey and Eoghan Mooney, who provide valuable information through postmortem examination. Dr Sam Doyle, Consultant Clinical and Biochemical Geneticist and Dr Willie Reardon, Consultant Geneticist provide expertise and sees couples in those cases where genetic assessment is required.

COVID-19 has impacted on how clinics are facilitated: Dr Allen's miscarriage clinics take place via Attend Anywhere or telephone consultations and have been well received by women and their partners. The Miscarriage Support Group continued monthly in 2021 with positive feedback. The group is currently held virtually due to COVID-19 restrictions. This initiative is the first midwifery led, hospital based support group in the country.

The Bereavement Midwives arrange all hospital burials in the Holy Angels plot in Glasnevin Cemetery. Burials were organized for 59 babies following early or mid-trimester miscarriage. We believe time invested in preparing babies for burial with respect and dignity is one of the most important aspects of our work.

The Annual Remembrance Service has grown to be a large event with some 1,000 people attending annually. It is an important day in our hospital calendar. COVID-19 restrictions impacted on the service however, the event was marked virtually by a candle lighting ceremony.

Support, information and advocacy continues to be provided to women who have experienced the death of a baby at any stage of pregnancy. We continue educational input with staff and student midwives within the hospital and UCD. The Hospice Friendly Hospitals standard of care initiatives are in place. The Irish Hospice Foundation education programme 'Dealing with Loss in Maternity Settings' was facilitated twice during 2021 by Sarah Cullen, CMS: this is an education programme aimed at supporting hospital staff involved directly or indirectly in bereavement care. We continue to work with colleagues in UCD on research in relation to bereavement care and education.

Breastfeeding Support Services

The Breastfeeding Support Team promotes and supports breastfeeding at The National Maternity Hospital (NMH).

72 % of mothers were documented on MN-CMS as intending to breastfeed. Approximately 50% of these breastfeeding babies received some formula during their hospital stay while approximately 25% of women at NMH chose to formula feed only. This topic was discussed at the Infant Feeding Steering Committee and strategies were put in place to reduce formula supplementation and will be an ongoing project in 2022.

The dedicated work of breastfeeding support in the NICU was highlighted to celebrate National Breastfeeding Week 2021 via an educational webinar 'PRIME: The journey of the premature baby'. Staff were also educated about the importance of strict compliance with the WHO International Code of Marketing Breastmilk Substitutes. A presentation was given by Malvina Walsh, the former Chairperson for the Baby Feeding Law group.

The Breastfeeding clinic continues to be supported by admin staff which has enabled appointment only face-to-face consultations. Strict enforcement of HSE COVID-19 guidelines was carried out with service users giving positive feedback frequently about this service. The attendance at the clinic has increased significantly year on year.

An innovative and user friendly webinar was introduced to replace the 8-hour breastfeeding course for staff, in conjunction with Continuing Medical Education (CME). A committee has been formed through the CME which ensures that breastfeeding education for staff follows a national standard for the future. This work has been ongoing throughout 2021.

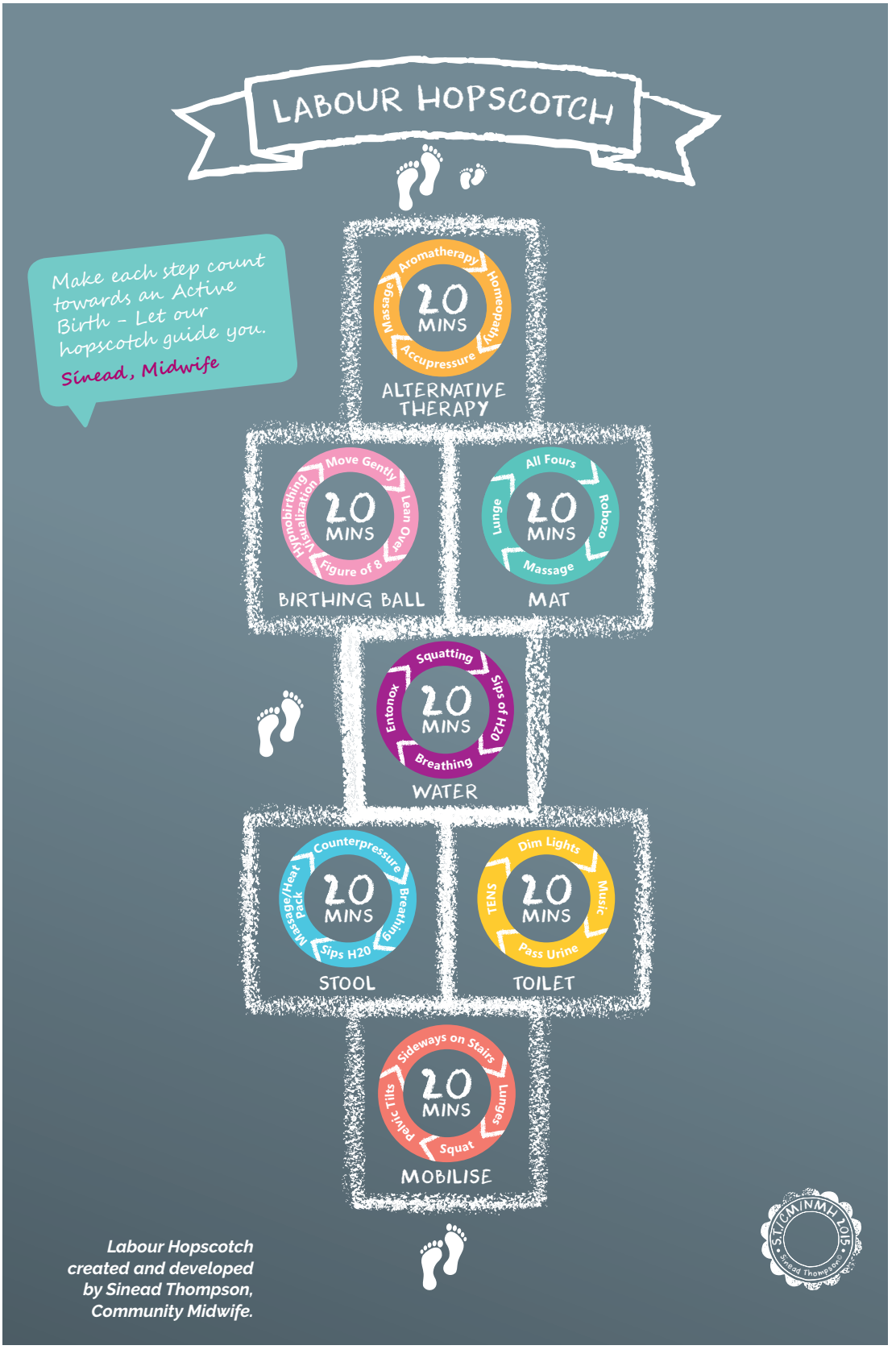
The Breastfeeding Support Team continues to be involved in the LatchOn study: a protocol for a multi-centre, randomised controlled trial of perinatal support to improve breastfeeding outcomes in overweight and obese women. This study is being undertaken in collaboration with UCD, Regional Hospital Mullingar, St. Luke's General Hospital Kilkenny and Wexford General Hospital.

Education Programmes for Staff	Education for Patients – Antenatal and Postnatal
8 hour breastfeeding course x 9 programmes	Preparation to breast-feed classes online x 24 classes
Paediatrician education x 4 sessions	Breastfeeding clinic x 104 clinics (twice weekly)
Midwifery and PHN student clinical specialty education – ongoing basis	Antenatal colostrum harvesting education x 52 sessions

Consultation Overview

Consultation Type	Women seen
One to one consultant all wards	3202
One to one consultation in NICU	636
Breastfeeding Clinic	1520
Preparation to Breastfeed Class	2130
Phone consults	~780
Email follow up	~520
Microbiology assessment and phone follow up	221

Community Midwifery Service



Labour Hopscotch created and developed by Sinead Thompson, Community Midwife.

The Community Midwifery Service is in its 23rd year of operation. We were delighted to present our key findings in relation to homebirths at the annual National Perinatal Epidemiological Centre (NPEC) conference earlier this year which demonstrated over 700 babies were born safely at home under this service. It also demonstrated the positive feedback we obtain from this hospital-based service.

Roxanne O'Sullivan and Niall Fagan with their newborn baby girl Lana Vivienne.

DOMINO/Homebirth Antenatal Care

The aims of the service are:

1. To provide continuity of care to low-risk women throughout pregnancy, labour and the postnatal period
2. To provide a 24-hour midwifery care for all women booked with the scheme
3. To have a community midwife providing care in labour and to have a community midwife known to the woman conducting her care
4. To provide early discharge home where the postnatal care can be done in the women's home

The antenatal clinics take place in Churchtown Primary Care Unit, Leopardstown Primary Care Unit, Bray Health Centre, Greystones Health Centre and Newtownmountkennedy Primary Health Unit. We have proudly opened and continued to operate in a new location at the Blackrock Centric Health. This has been a fantastic addition to our service as the women report extreme satisfaction with its location and convenience for the provision of antenatal care. We encourage all women to have combined care with their GPs. If a non-urgent obstetric opinion is requested, women are reviewed by Dr. Fonseca-Kelly at The National Maternity Hospital with the CMM3 Teresa McCreery. All women who are over 40 weeks' gestation have a liquor volume done at this clinic. Women have reported they like this reassurance scan. If a woman needs an urgent medical opinion, the NCHDs on-call , will review the woman as requested by the community midwife. It is interesting to note that the number of women and total number of appointments are similar to last year's activity levels. The NMH outpatient Midwifery and Consultant clinic numbers increased significantly due to the need for women to be reviewed if they had experienced COVID-19 in pregnancy. This is no longer a requirement as new evidence has emerged about this virus and the large uptake of vaccinations of the DOMINO cohort of women.

Following discussion with the CMM3 of the Community Services, Valerie Spillane, CMM3 in Fetal Medicine Unit, rolled out a 'Basics in Ultrasound' course. Six midwives underwent this training and are currently completing the practical element which will enable them to carry out a basic fetal wellbeing scan post-term in the community clinics. Scan machines have been ordered and once in operation, will enable the midwives to complete a liquor volume assessment and a fetal position confirmation in the antenatal clinics as per the guideline on Q-pulse.

Another positive development on the team that Bronwyn Nicol, Staff Midwife, underwent the IBCLC Breastfeeding training. Together with Eimear O'Connor CMM2 and Fionnuala Mullen CMM1, an antenatal lactation class for all women who attend the Community Midwifery Service has commenced. This new service will be evaluated and amended depending on the response from the service evaluation.

The Community Midwifery Antenatal Classes continue to be delivered online and while being challenging for the midwives, women have continued to give positive feedback with this resource. A PowerPoint template was created and each of the midwives amend it to suit their teaching style.

Bookings - There were a total of 757 women booked with the service of which 504 women ended up giving birth with this service; 100 pregnancies ended as a miscarriage. Of the remaining 153, 37% of these women cited they wish for consultant-led care for access to regular bedside scans as the reason for transfer. See Table 2

Homebirths - We had 36 homebirths in 2021. We are particularly proud that 9 of these were nulliparous women. Historically, this is one of the highest numbers of nulliparous women achieving a homebirth with our service. It is also interesting to note 5 multiparious women booked a homebirth, but chose to birth in the hospital. See Table 3

Intrapartum care - Of the 213 nulliparous women who birthed with the Community Midwifery Team, it is very notable that 40% required induction of labour. The indications for induction are the same as per the National Maternity Hospital Policy with the main reason for induction being PSROM (17%), fetal interest (10%), advanced maternal age (3%) and postdates (3%). It is also interesting to note the Robson Group 1 LSCS rate is down from 7% to 5.5%. The only reason for the elective LSCS for nulliparous was breech presentation. See Tables 4 & 5

The epidural rate (table 6) is largely the same as it was in 2020, nulliparous women being 47% and multiparous women 10% irrespective of pathway of delivery. We are using the hydrotherapy pool as much as possible, but there are a number of women excluded from using it due to the need for continuous fetal monitoring.

The perineal outcome for women who had a vaginal birth are in table 7

While the 35% episiotomy rate for nulliparous looks extraordinary high, this figure is inclusive of the women who had an instrumental birth. However, 17% nullips who had a spontaneous vaginal birth required an episiotomy. The 3rd degree tear rate is equal in both multips and nullips.

Nicola Conway, Community Midwife.

Breastfeeding - One of the key success indicators is the 90% breastfeeding rate on discharge from the service. See table 8

DOMINO /EARLY TRANSFER HOME PROGRAMME (ETHP) POSTNATAL CARE

12,664 visits to mothers and babies were seen at home in 2021 (Table 9). The ETHP midwives see all women on the postnatal ward prior to discharge to ensure they are suitable and wish for this service. Feedback continues to be positive about this service and as previously stated the main advantage of this service is the high rate of women breast feeding on discharge.

External Clinics - The mixed risk clinics are supported by Dr. Broderick and Dr. Nita Adnan in Loughinstowm, Bray Arklow, Greystones and Wicklow Town. The challenges of the COVID-19 pandemic remain in these clinics. The activity levels have increased by 20% from 2020 levels in both the number of appointments and number of women attending. (Table 10)

Other Developments - The policies and guidelines are undergoing review and the majority of these have been updated on Qpulse in the last 6 months. Nicola Conway trained in the examination of the newborn and we have currently another two midwives in training. Ivana Lambe and Nicola Smyth successfully completed an MSC in midwifery while Julie Higgins has been awarded a doctorate from UCD. The level of academia achieved by the team is a true reflection of the commitment to midwifery-led care of the service.

Table 1

	No. of Women	New Attended	Follow Up Attended	Total
Domino Bray Clinic	134	53	354	407
Domino Midwives Blackrock Clinic	160	91	446	537
Domino Greystones Clinic	138	66	347	413
Domino Churchtown Clinic	174	94	567	661
Domino Newtownmountkennedy	99	40	231	271
Domino Pearse Street Clinic	139	64	361	425
Domino Leopardstown Clinic	165	69	444	513
	1009	**477**	**2750**	**3227**

Table 2: Reasons for transferring from scheme Maternal High Risk (MHR)

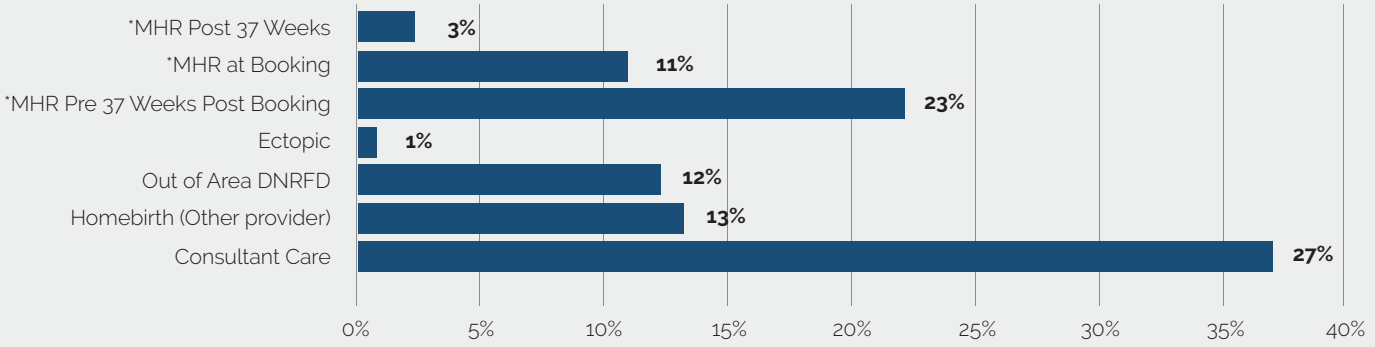


Table 3: Reasons for transferring from Homebirth Service

	Planned homebirth	Actual homebirth	Reasons for transfer out of Homebirth service							
			PSROM	Post Dates	GBS	Failure to advance	Maternal Choice	Fetal interest	High risk	Other
Multips	53	27(51%)	5	3	1	0	5	2	3	7
Nullips	27	9 (33%)	2	1	1	1	0	3	6	4
	80	**36 (45%)**	**7 (9%)**	**4(5%)**	**2**	**1**	**5**	**5**	**9 (11%)**	**11**

Table 4: Community Midwives Robson Ten Groups Classification of Caesarean Section

	All Sections	Births	Size of Group	C/S Rate in Group	Contr of each group
1. Nulliparous, single cephalic, >=37 weeks, in spontaneous labour	6	109	21.8%	5.5%	1.2%
2. Nulliparous, single cephalic, >=37 weeks, induced and CS before labour	32	0	0.0%	0.0%	6.4%
2a. Nulliparous, single cephalic, >=37 weeks, induced	29	85	17.0%	34.1%	5.8%
2b. Nulliparous, single cephalic, >=37 weeks, CS before labour	3	3	0.6%	100.0%	0.6%
3. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, in spontaneous labour	1	211	42.3%	0.5%	0.2%
4. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, induced and CS before labour *	2	0	0.0%	0.0%	0.4%
4a. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, induced	0	65	13.0%	0.0%	0.0%
4b. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, CS before labour	2	2	0.4%	100.0%	0.4%
5. Previous CS, single cephalic, >= 37 weeks					
6. All nulliparous breeches	10	10	2.0%	100.0%	2.0%
7. All multiparous breeches (including prev. CS)	2	4	0.8%	50.0%	0.4%
8. All multiple pregnancies (including prev. CS)	0	0	0.0%	0.0%	0.0%
9. All abnormal lies (including prev. CS)	2	2	0.4%	100.0%	0.4%
10. All single cephalic,<=36 weeks (including prev. CS)	1	8	1.6%	12.5%	0.2%
Total	**56**	**499**		**11%**	

Table 5	Nulliparous		Multiparous		Total	
Spontaneous vaginal	113	53.1%	275	96.2%	388	77.8%
C-Section	49	23.0%	7	2.4%	56	11.2%
Forceps	9	4.2%	1	0.3%	10	2.0%
Ventouse	38	17.8%	0	0.0%	38	7.6%
Ventouse/Forceps	4	1.9%	3	1.0%	7	1.4%

Table 6

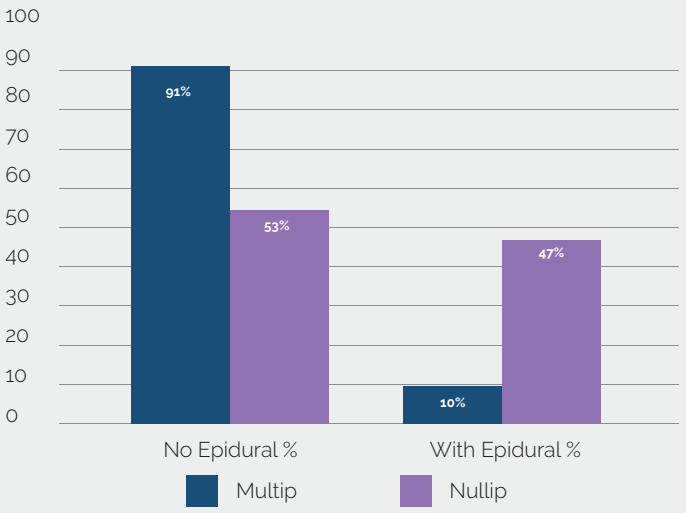
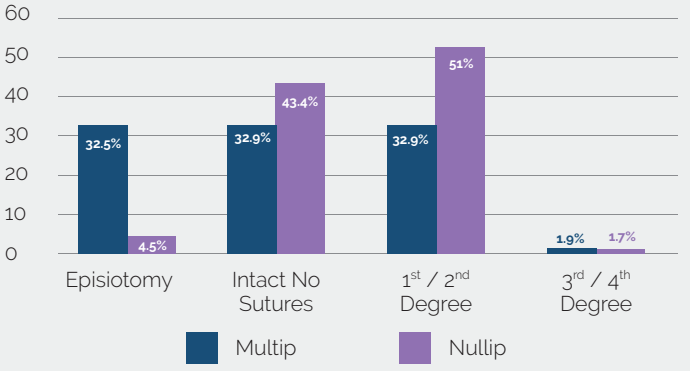


Table 7



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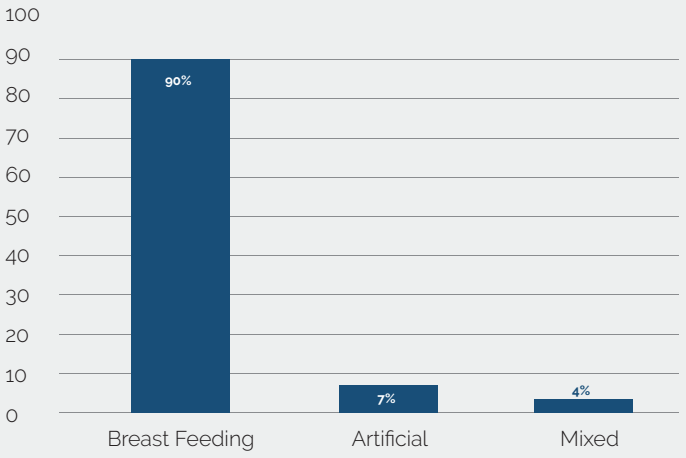


Table 9

Domino - Dublin Home Visits	2810
Domino - Wicklow Home Visits	1036
TOTAL	**3846**
ETH - Dublin Home Visits	6550
ETH - Wicklow Home Visits	2268
	8818

Table 10	Number of Women	New Attended	Follow Up Attended
Ballinteer Antenatal Clinic	109	-	843
Dunlaoghaire Antenatal Clinic	130	-	412
Bray Antenatal Clinic	130	130	1
Newtownmountkennedy Antenatal Clinic	200	202	0
Arklow Antenatal Clinic	162	228	2072
Bray Antenatal Clinic	270	-	865
Greystones Antenatal Clinic	207	-	650
Loughlinstown Antenatal Clinic	279	119	702
Wicklow Antenatal Clinic	232	-	821
Total	**1718**	**680**	**5,111**

Diabetes

Ciara Coveney, Advanced Midwife Practitioner, Diabetes.

As is common to every other clinical service within the hospital, the greatest challenge this year was continuing clinical work during the ongoing COVID-19 pandemic. We were determined to continue to provide high quality multidisciplinary care to patients within our service, while also be conscious that many had significant risk factors for severity of disease should they contract the infection. As such, it was a relief when patients with pre-existing diabetes were prioritized to receive the COVID-19 vaccine, and many received the vaccine within the hospital thanks to the amazing work of the vaccine team.

The numbers of women presenting with Pre-existing diabetes (Type One, Type 2, MODY and Cystic-Fibrosis Related Diabetes) remained similar to referrals from previous years. The complexity of care has noticeably changed from previous years. The National Maternity Hospital provides a comprehensive service for women using Continuous Subcutaneous Insulin Pump Therapy (CSII) and continuous glucose monitoring (sensor) technology. The provision of this service requires expert training and continuous professional development to keep up to date with the multiple technology advances being made in diabetes care internationally. Current figures show that nearly 50% of women with T1DM in our service are now using insulin pumps. Although the numbers of women with pre-existing diabetes in the service are small compared to the GDM cohort they are under the care of the service from 6 weeks' gestation and require weekly MDT input. (See Table on page 77).

The midwifery led gestational diabetes service, supported by dietetics saw a 31% increase in referrals this year, making it the busiest year the service has experienced. The virtual GDM service has proven to be a success with acceptances, invitations and presentations at multiple national and international midwifery and medical conferences. Our innovative service was also featured in articles in the Irish Times and presentations for the State Claims Agency, The Association of the Directors of Nursing and Midwifery Annual Conference and Diabetes Ireland

conferences. The midwifery led service was also short listed for a HSE Health Service Excellence award amongst many prestigious clinical innovations and nationwide MDT's. The midwifery team secured funding from the NMDPU for an 'Evaluation of the Implementation of a Virtual Care Pathway for GDM Midwifery Services'.

This pathway is only made possible with the support of our dietetic colleagues in particular who provide ongoing expert input for this cohort and is also supported by Endocrinology, Obstetrics, Dietetics and the wider MDT. Following the development of this Registered Advanced Midwifery Practitioner (RAMP) led service, we have seen a reduction in overall pharmacological treatment rates this year, which, on the background of a significant increase in patient numbers is very welcome. Of 774 (91% of total service referrals) women with GDM, 184 required pharmacological therapy (15% required insulin and 8% required metformin). This yields a total treatment rate of 23%, meaning that 77% of women diagnosed with GDM remain in RAMP led care

The team is committed, hardworking and multidisciplinary, benefitting from the mutual respect of all the team members. The team has always had excellent representation from dietetics (*Catherine Chambers, Rachel Sheane, Sinéad Curran and Laura Harrington*), midwifery (*Ciara Coveney RAMP, Eimear Rutter CMS, Sally Byrne and Hannah Rooney*), endocrinology (*Prof Mensud Hatunic, Dr Recie Davern* (Fellow)) obstetrics (*Prof. Mary Higgins, Dr Jennifer Walsh; Dr Rhona Mahony, Dr Clare O'Connor Dr Niamh Keating, Dr Maggie O'Brien (Fellows*) and administration (*Helen McCrimmon*).

Dr Niamh Keating joined the team in July 2019 as part of her two-year fellowship in Maternal Medicine, where she completed research to MD level in Diabetes and Pregnancy. Niamh's research included auditing the change in GDM screening as a result of the pandemic from April to June 2020 and comparing to results from 2019. This has been accepted for publication. Niamh is currently writing up her research in preparation for submission in 2022.

Dr Recie Davern is completing her second year of MD/Endocrine Fellow. Her research focuses on development of a normogram for thyroid function tests in pregnancy; this will be enormously useful clinically and her results are awaited eagerly.

Year	Type 1 diabetes	Type 2 diabetes	GDM and Previous GDMs	Impaired glucose tolerance	Cystic Fibrosis Related Diabetes	Maturity Onset Diabetes of the Young (MODY)	Total
2015	44	14	382	213	-	-	**653**
2016	42	17	365	248	-	-	**672**
2017	46	24	302	223	-	-	**595**
2018	40	13	354	251	-	-	**658**
2019	39	20	364	231	-	-	**654**
2020	43	19	589	N/A*	3	2	**656**
2021	47	17	774	N/A	6	0	**844**

Hilary Devine moved to work as a Senior Dietitian in the Rotunda Hospital Dublin where we wish her the very best and are confident that the patients will benefit from her expertise.

The new Maternal Medicine Fellow, Dr Maggie O'Brien, joined the team in July 2021; Maggie is completing a MSc in antenatal care for migrant/traveler groups.

Diabetes and Pregnancy model of care – Mensud Hatunic, Mary Higgins and Ciara Coveney are continuing their work in developing a national Model of Care for Diabetes in Pregnancy for Ireland.

The midwifery led service was also short listed for a HSE Health Service Excellence award amongst many prestigious clinical innovations and nationwide MDT's.

Final year medical students working within the clinic, who completed research projects that contributed to this chapter, included Sofia Dragavac, Caoimhe Patchett, Alannah Dolan and Liam Shaw. All will (hopefully!) graduate this year and start work as doctors and we wish them all the best.

It is a pleasure to continue to work as a team in the care of women with complex medical needs.

Sean Dalton with his newborn baby Indie.

Labour and Birthing Unit

Christine Higgins, Staff Midwife, at the Hydrotherapy Pool in the Labour and Birthing Unit.

The National Maternity Strategy 2016-2026 recognises that pregnancy and birth is a normal physiological process, and insofar as it is safe to do so, a woman's choice of maternity care should be facilitated. The vision for maternity services, as set out by the strategy, is one which places women and their families at the centre of the services provided. A choice of pathway of maternity care for each individual woman should be made available based on a risk profile. All pathways of care will strive to support the normalisation of the birth process as much as possible. An integral part of this vision is the commitment to providing a birthing unit that is a calm and relaxing environment, one that can best support the physiological process of birth.

In 2021 all of the Labour and Birthing Unit (LBU) renovation works were completed and all women can now choose to use hydrotherapy in labour by using the birthing pool or one of the 12 ensuite rooms available. All of these rooms are suitable for the provision of comfortable, low tech birth whereby labour aids such as birthing balls and stools can be utilised. Natural coping strategies, such as the labour hopscotch are clearly promoted throughout the unit. All options of care in labour needs are

considered. If epidural analgesia, electronic fetal monitoring or oxytocin is required, women will remain in their allocated room and the same midwife will continue to provide care.

In May of 2021 we proudly opened our bereavement suite on the Labour and Birthing Unit.This rooms provides a quiet and comfortable space for couples who are labouring in bereaved circumstances and they remain in this space until discharge.

The staff of the LBU are proud to commit to providing care in a homely environment that is of a high standard and one which respects woman's choice, dignity and need for privacy during childbirth.

The staff of the LBU are proud to commit to providing care in a homely environment that is of a high standard and one which respects woman's choice, dignity and need for privacy during childbirth.

Evaluation, Feedback and Debriefing Following Delivery

All women who attend the labour and birthing unit are invited to complete an evaluation form following the birth of their baby. The forms provide valuable feedback to staff regarding the experiences of women and their comments provide staff with insight as to how care given can be improved. The form is simple and has open ended questions to allow all points to be made.

Most of the forms are completed by the women in the first few days postnatally. Once completed, these forms are returned to the delivery ward. They are read on a daily basis and initial adverse comments may be addressed while the women are still in hospital. Alternatively, women may request to meet with the CMM3 of the LBU and many concerns can be clarified as part of an inpatient discussion.

A 'tick box' is provided on the form if women wish to discuss their care further. If any negative feedback is given or a woman indicates she wishes to discuss her labour/delivery the CMM3 of the labour ward will contact the woman by telephone. Some points can be dealt with over the telephone but for those who wish to have a more detailed discussion a follow up appointment is made for discussion with the labour ward manager and obstetric consultant in necessary.

All completed evaluation forms are available on the LBU for staff to read and they are encouraged to do so. Both positive and negative feedback is discussed with staff who constantly strive to improve patient experience. The delivery ward staff work hard to provide a high standard of care and value any suggestions on service improvement. A list of the most common positive and negative points is given in the table below.

Antenatal Consultation

An increasing number of antenatal consultations are undertaken for a number of women who had either a fear of delivery or a previous negative birthing experience. Some mothers actively avoid pregnancy and are grateful to have the opportunity to discuss their fears and anxiety. These women are referred by midwives, obstetricians or the mental health team for discussion and antenatal preparation.

An increasing number of women are also referred to the Clinical Midwife Manager (CMM3) if they write a birth plan which needs a more detailed discussion with a member of staff.

Postnatal Debriefing Clinic

The postnatal debriefing clinic is run by the CMM3, Martina Cronin and Consultant Obstetrician Dr Michael Robson (until October 2021). Mothers who have a delivery complicated by shoulder dystocia or any other traumatic birth can be referred to this clinic.

Increasingly women themselves are self-referring requesting a discussion about their birth experience.

This clinic offers the opportunity for patients to ask questions and seek clarification about their labour and birth events. These meetings are held outside the main hospital building in a relaxed environment with a generous time allocation to facilitate detailed discussion and debriefing. These discussions took place virtually or in person, depending on patient preference and COVID-19 recommendations at the time.

Positive Points	
One to one care	Made patient comfortable
Attentive	Vigilant at monitoring things closely
Good team work	Safe experience
Staff educated, efficient, informative	Very professional staff
All procedures explained	Staff are sympathetic and hard working
Wishes acknowledged	Students helpful and involved
Understanding	Consultant very supportive
Nice rooms with good equipment	Well looked after
Respectful	Reassuring, friendly, kind
Negative Points	
Delay in getting epidural	As a VBAC mum more explanation required
Partners not allowed in antenatal ward is very difficult (Covid)	Ward too noisy due to construction
More explanation needed for the 'not in labour' period	Facilities on antenatal ward for early labour very poor
Delay in doctor review	More preparation needed for IOL process

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Antenatal Reviews	6	6	4	1	2	3	1	3	4	0	0	0	**29**
Ward Visits	4	5	1	2	5	3	2	1	3	0	0	0	**27**
Telephone Follow Ups	24	28	15	10	9	17	23	9	18	2	14	3	**172**
Postnatal Reviews	0	4	15	7	3	3	12	6	6	5	1	5	**67**

Labour and Delivery Audit

In January 2018, The National Maternity Hospital went live with the Maternal and Newborn Clinical Management System (MN-CMS). Effectively this is an electronic patient record for mother and baby which tells the story of their care but also collects all events, outcomes and complications. It also includes laboratory ordering and medication prescribing so that all care is digitally recorded. It now communicates with general practitioners and will eventually include a patient portal. It has the potential to be the most significant change to the way we provide healthcare in the future.

Routine data collection is a challenge to any organisation. The first measure of quality is knowing your results and the second is being able to interpret them. It helps when there is standardisation so you can compare and learn from others. The National Maternity Hospital has a long history of producing detailed Annual Clinical Reports and has lead the way in perinatal audit. It has now a unique opportunity to continue this tradition. A commitment both in terms of resources and leadership is required but this investment will be rewarded in the future.

The principle that has been applied to data collection in the MN-CMS is that if you do something then you record it in MNCMS. The Electronic Patient Record vendors have a responsibility to make it as easy as possible to record the information and analyse the results. Clinicians and administrative staff have a responsibility to document accurately and in a disciplined manner.

Student Midwife Ramanpreet Kaur with Eleanor Woods, Clinical Midwife Manager, Merrion Wing Postnatal Ward.

The interpretation of a clinical report will depend on three variables. Data quality (disciplined data collection using consistent definitions), significant epidemiological characteristics and lastly clinical practice. A good report will enable the reader to hypothesise which of these variables singularly or together contribute to the results recorded. Comments made in this chapter will attempt to demonstrate this.

Audit of maternal and fetal outcomes following labour and delivery in this chapter is based on a standardised prospective framework consisting of the four obstetric concepts within which there are different parameters. The obstetric concepts are **previous record of the pregnancy** *(nulliparous, multiparous without a uterine scar, multiparous with a uterine scar)* **category of pregnancy** *(single cephalic pregnancy, single breech pregnancy, single oblique or transverse lie, or multiple pregnancy)* **course of labour and delivery** *(spontaneous labour, induced labour or pre labour caesarean)* and **gestational age in completed weeks at the time of delivery.** Within this structure all perinatal events and outcomes, patient satisfaction and complications can be analysed. It is useful to remember when classifying in to homogenous groups of women the incidence of events, outcomes and complications are relatively consistent and are helpful in validating data. It is also important to remember in analysing events and outcomes it is unusual to over record (possibly due to change in data definition or application) but not unusual to under record (usually then due to inaccurate collection). It is easier to assess this the more years of data you have for comparison.

This is the fourth Clinical Report since the introduction of the MN-CMS and many of the same challenges remain and new ones develop but the amount of information contained in this chapter continues to increase. Significant efforts are made to improve data quality and reporting. Validation of information collected takes place on a daily basis with continuous training and feedback to clinicians.

In 2021 there was a cyber-attack on the Health Service Executive computer systems and this

effected MN-CMS as well as other information systems during the period between the 14th May and the 30th June 2021. During that period clinical care was recorded using a paper based system and only a minimal dataset was retrospectively recorded into the MN-CMS database, although all the patients' charts were scanned in. This process was only completed on April 1st 2022. As a result of the Cyber-attack there is also a change freeze restriction in place which presently limits us improving the way we collect and view clinical information.

Therefore as far as this chapter is concerned some of the information is incomplete for the period of 14th May to the 30th June 2021. This will affect the incidence of certain labour and delivery events and outcomes including indications for induction of labour, artificial rupture of the membranes, epidural, fetal blood sampling and caesarean section at full dilatation.

Importantly though the overall numbers of women and the Robson Ten Group Classification System is correct and contributes to giving an overview of care.

Fidelma Martin, Neonatal Clinical Skills Facilitator with Neonatal Nurses on orientation, Rachel Slamon and Razel Gregory.

Population changes of nulliparous women and multiparous women

	1999				2019			
	Number in group	Number of C/S	Contribution to total population	% C/S	Number in group	Number of C/S	Contribution to total population	% C/S
Nullip	3465	562	3465/7533 (46.0%)	562/3465 (16.2%)	3415	1104	3415/7871(43.4%)	1104/3412 (32.4%)
Multip no scars	3559	185	3559/7533 (47.2%)	185/3559 (5.2%)	3288	334	3288/7871 (41.8%)	317/3272 (9.7%)
Multip + 1 scar	450	169	450/7533 (6.0%)	169/450 (37.6%)	930	708	930/7871 (11.8%)	963/1187 (81.0%)
Multip + 2 or more scars	59	58	59/7533 (0.8%)	58/59 (98.3%)	238	236	238/7871 (3.0%)	
Totals	**7533**	**974**		**974/7533 (12.9%)**	**7871**	**2382**		**2384/7871 (30.3%)**

	2020				2021			
	Number in group	Number of C/S	Contribution to total population	% C/S	Number in group	Number of C/S	Contribution to total population	% C/S
Nullip	3201	1025	3201/7263 (44.1%)	1025/3201(32.0%)	3256	1076	3256/7694 (42.3%)	1076/3256 (33.0%)
Multip no scars	2956	349	2956/7263 (40.7%)	349/2956 (11.8%)	3260	366	3260/7694 (42.3%)	366/3260 (11.2%)
Multip + 1 scar	882	683	882/7263 (12.1%)	683/882 (77.4%)	945	736	945/7694 (12.2%)	736/945 (77.9%)
Multip + 2 or more scars	224	222	224/7263 (3.1%)	222/224 (99.1%)	233	233	233/7694 (3.0%)	233/233 (100%)
Totals	**7263**	**2279**		**2279/7263 (31.4%)**	**7694**	**2411**		**2411/7694 (31.3%)**

Comment: Slight overall decrease in nulliparous women to 2020

Onset Rates

	1999	%	2012	%	2013	%	2014	%	2015	%
Spontaneous	5062	67.2%	5494	61.2%	5214	59.6%	5347	58.7%	5164	56.2%
Induced	2006	26.6%	2367	26.4%	2323	26.5%	2465	27.1%	2534	27.6%
Pre-labour CS	466	6.2%	1117	12.4%	1218	13.9%	1294	14.2%	1488	16.2%
Total Deliveries	**7534**		**8978**		**8755**		**9106**		**9186**	

	2016	%	2017	%	2019	%	2020	%	2021	%
Spontaneous	4850	54.8%	4461	52.9%	3841	48.8%	3240	44.6%	3434	44.6%
Induced	2530	28.6%	2518	29.9%	2443	31.0%	2500	34.4%	2644	34.4%
Pre-labour CS	1471	16.6%	1454	17.2%	1587	20.2%	1523	21.0%	1616	21.0%
Total Deliveries	**8851**		**8433**		**7871**		**7263**		**7694**	

Comment: No significant change in onset of labour and delivery as compared to 2020

Overall Delivery Method

	2016	%	2017	%	2019	%	2020	%	2021	%
Spontaneous Vaginal Delivery	5287	59.7%	5048	59.9%	4498	57.1%	4063	55.9%	4348	56.5%
Vaginal Operative Delivery	1261	14.2%	1094	13.0%	989	12.6%	921	12.7%	935	12.2%
Caesarean Section	2303	26.0%	2291	27.1%	2384	30.3%	2279	31.4%	2411	31.3%
Total	**8851**		**8433**		**7871**		**7263**		**7694**	

Comment: No significant change in overall delivery method as compared to 2020

Oxytocin Rates 2021

Oxytocin Rates	Nullip	Multip no scar	Multip +scar	Total
No Oxytocin	1677 (51.5%)	2650 (81.3%)	1149 (97.5%)	5476 (71.2%)
Oxytocin	1579 (48.5%)	610 (18.7%)	29 (2.5%)	2218 (28.8%)
	3256	**3260**	**1178**	**7694**

Comment: Slight reduction in oxytocin rates as compared with 2020

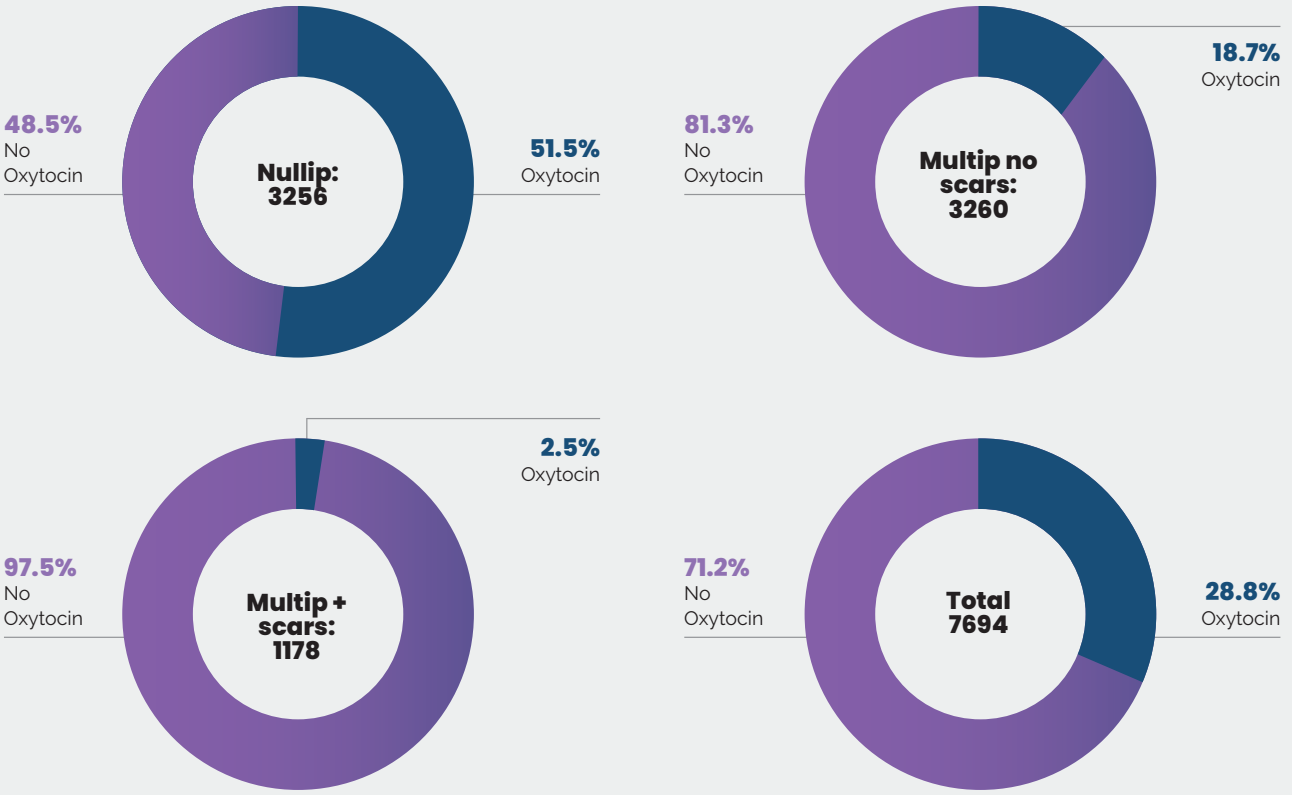


Table I: The overall caesarean section rate as classified by the 10 groups (total numbers)

Year	1974*	1984*	1994*	2015	2016	2017	2018	2019	2020	2021
Totals	**377/7546**	**330/7758**	**551/6244**	**2382/9186**	**2303/8851**	**2291/8433**	**2157/7496**	**2384/7871**	**2279/7263**	**2411/7694**
1	46/2020	63/2259	80/1771	177/2044	151/1925	155/1716	147/1515	127/1468	113/1283	137/1322
2	68/555	41/378	104/566	577/1483	570/1472	566/1479	525/1249	697/1544	646/1531	645/1527
2a				448/1354	437/1339	426/1337	363/1085	490/1336	449/1334	436/1318
2b				129	133	142	162/164	207/208	197/197	209/209
3	24/3217	15/3739	25/2467	41/2527	24/2389	28/2223	34/2038	20/1946	11/1567	24/1700
4	88/967	19/562	38/622	142/1038	144/1105	132/1079	178/994	152/1053	177/1112	179/1281
4a				54/950	44/1005	48/995	72/888	46/947	50/985	58/1160
4b				88	100	84	106	106	127/127	121/121
5	32/196	74/332	108/321	817/1120	821/1069	748/986	712/917	816/1024	792/979	858/1041
6	26/79	27/79	65/99	201/208	162/171	222/229	165/175	176/191	143/152	170/181
7	7/105	14/98	40/78	120/129	115/124	124/141	105/121	143/156	123/133	110/120
8	10/93	18/96	25/78	125/205	119/187	123/190	92/103	87/129	93/136	105/156
9	20	23	15	33	30	30	38/38	32/32	45/45	40/40
10	56/294	36/192	51/227	149/399	167/379	163/360	161/346	134/328	136/325	143/326

** Years 1974, 1984 and 1994 were not split up into 2a, 2b and 4a, 4b. The numbers are inclusive of inductions and pre labour caesarean sections*

Table II: The contribution that each group makes to the overall hospital population (percentages)

Year	1974	1984	1994	2015	2016	2017	2018	2019	2020	2021
1	26.7%	29.1%	28.4%	22.3%	21.8%	20.3%	20.2%	18.7%	17.7%	17.2%
2	7.4%	4.9%	9.1%	16.8%	16.6%	17.5%	16.7%	19.6%	21.1%	19.8%
2a				15.3%	15.1%	15.9%	14.5%	17.0%	18.4%	17.1%
2b				1.5%	1.5%	1.7%	2.2%	2.6%	2.7%	2.7%
3	42.6%	48.2%	39.5%	28.6%	27.0%	26.4%	27.2%	24.7%	21.6%	22.1%
4	12.8%	7.2%	10.0%	11.7%	12.5%	12.8%	13.3%	13.4%	15.3%	16.6%
4a				10.7%	11.4%	11.8%	11.8%	12.0%	13.6%	15.1%
4b				1.0%	1.1%	1.0%	1.4%	1.3%	1.7%	1.6%
5	2.6%	4.3%	5.1%	12.7%	12.1%	11.7%	12.2%	13.0%	13.5%	13.5%
6	1.1%	1.0%	1.6%	2.4%	1.9%	2.7%	2.3%	2.4%	2.1%	2.4%
7	1.4%	1.3%	1.2%	1.5%	1.4%	1.7%	1.6%	2.0%	1.8%	1.6%
8	1.2%	1.2%	1.2%	2.3%	2.1%	2.3%	1.4%	1.6%	1.9%	2.0%
9	0.3%	0.3%	0.2%	0.4%	0.3%	0.4%	0.5%	0.4%	0.6%	0.5%
10	3.9%	2.5%	3.6%	4.5%	4.3%	4.3%	4.6%	4.2%	4.5%	4.2%

Comment: The sizes and ratios of Group 1: Group 2 reflect the changing incidence of induction and pre labour caesarean section. This is a change of clinical practice partly at least as a result of changing epidemiological variables.

Table III: The caesarean section rate within each of the 10 groups (percentages)

Year	1974	1984	1994	2015	2016	2017	2018	2019	2020	2021
Totals	**5.0%**	**4.3%**	**8.8%**	**25.9%**	**26.0%**	**27.2%**	**28.8%**	**30.3%**	**31.4%**	**31.3%**
1	2.3%	2.8%	4.5%	8.7%	7.8%	9.0%	9.7%	8.7%	8.8%	10.4%
2	12.3%	10.8%	18.3%	38.9%	38.7%	38.3%	42.0%	45.1%	42.2%	42.2%
2a				33.1%	32.6%	31.9%	33.5%	36.7%	33.7%	33.1%
2b				100.0%	100.0%	100.0%	98.8%	99.5%	100.0%	100.0%
3	0.7%	0.4%	1.0%	1.6%	1.0%	1.3%	1.7%	1.0%	0.7%	1.4%
4	9.1%	3.4%	6.1%	13.7%	13.0%	12.2%	17.9%	14.4%	15.9%	14.0%
4a				5.7%	4.4%	4.8%	8.1%	4.9%	5.1%	5.0%
4b				100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
5	16.3%	22.3%	33.5%	72.9%	76.8%	75.9%	77.6%	79.7%	80.9%	82.4%
6	32.9%	34.2%	65.0%	96.6%	94.7%	96.9%	94.3%	92.1%	94.1%	93.9%
7	6.7%	14.3%	50.6%	93.0%	92.7%	87.9%	86.8%	91.7%	92.5%	91.7%
8	10.8%	18.8%	31.6%	61.0%	63.6%	64.7%	89.3%	67.4%	68.4%	67.3%
9	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
10	19.0%	18.8%	22.4%	37.3%	44.1%	45.3%	46.5%	40.9%	41.8%	43.9%

Comment: Caesarean section rates in spontaneous labour (Groups 1 and 3) remain low but in Group 1 has increased.

Table IV: The absolute contribution of each group to the overall caesarean section rate percentages)

Year	1974	1984	1994	2015	2016	2017	2018	2019	2020	2021
Totals	5.0%	4.3%	8.8%	25.9%	26.0%	27.2%	28.8%	30.3%	30.4%	31.3%
1	0.7%	0.8%	1.7%	2.0%	1.7%	1.8%	2.0%	1.6%	1.6%	1.8%
2	0.9%	0.5%	0.4%	6.5%	6.4%	6.7%	7.0%	8.9%	8.9%	8.4%
2a				5.1%	4.9%	5.1%	4.8%	6.2%	6.2%	5.7%
2b				1.5%	1.5%	1.7%	2.2%	2.6%	2.7%	2.7%
3	0.3%	0.2%	0.4%	0.5%	0.3%	0.3%	0.5%	0.3%	0.2%	0.3%
4	1.2%	0.2%	0.6%	1.6%	1.6%	1.6%	2.4%	1.9%	2.4%	2.3%
4a				0.6%	0.5%	0.6%	1.0%	0.6%	0.7%	0.8%
4b				1.0%	1.1%	1.0%	1.4%	1.3%	1.7%	1.6%
5	0.4%	1.0%	1.7%	9.2%	9.3%	8.9%	9.5%	10.4%	10.9%	11.2%
6	0.3%	0.3%	1.0%	2.3%	1.8%	2.6%	2.2%	2.2%	2.0%	2.2%
7	0.1%	0.2%	0.6%	1.4%	1.3%	1.5%	1.4%	1.8%	1.7%	1.4%
8	0.1%	0.2%	0.4%	1.4%	1.4%	1.5%	1.2%	1.1%	1.3%	1.4%
9	0.3%	0.3%	0.2%	0.4%	0.3%	0.4%	0.5%	0.4%	0.6%	0.5%
10	0.7%	0.5%	0.8%	1.7%	1.9%	1.9%	2.1%	1.7%	1.9%	1.9%

Groups

1. Nulliparous, single cephalic, >=37 weeks, in spontaneous labour
2. Nulliparous, single cephalic, >=37 weeks, induced and CS before labour
   2a. Nulliparous, single cephalic, >=37 weeks, induced
   2b. Nulliparous, single cephalic, >=37 weeks, CS before labour
3. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, in spontaneous labour
4. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, induced and CS before labour

4a. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, induced

4b. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, CS before labour

5. Previous CS, single cephalic, >= 37 weeks
6. All nulliparous breeches
7. All multiparous breeches (including prev. CS)
8. All multiple pregnancies (including prev. CS)
9. All abnormal lies (including prev. CS)
10. All single cephalic, <= 36 weeks (including prev. CS

Robson Ten Group Classification of Caesarean Section 2021

	CS No.	Number of Delivery / Births	Size of Group %	CS rate in grp %	Contr of each grp %
1. Nulliparous, single cephalic, >=37 weeks, in spontaneous labour	137	1322	17.2%	10.4%	1.8%
2. Nulliparous, single cephalic, >=37 weeks, induced and CS before labour	645	1527	19.8%	42.2%	8.4%
3. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, in spontaneous labour	24	1700	22.1%	1.4%	0.3%
4. Multiparous (excluding prev. CS), single cephalic, >=37 weeks, induced and CS before labour *	179	1281	16.6%	14.0%	2.3%
5. Previous CS, single cephalic, >= 37 weeks	858	1041	13.5%	82.4%	11.2%
6. All nulliparous breeches	170	181	2.4%	93.9%	2.2%
7. All multiparous breeches (including prev. CS)	110	120	1.6%	91.7%	1.4%
8. All multiple pregnancies (including prev. CS)	105	156	2.0%	67.3%	1.4%
9. All abnormal lies (including prev. CS)	40	40	0.5%	100.0%	0.5%
10. All single cephalic,<=36 weeks (including prev. CS)	143	326	4.2%	43.9%	1.9%
Total	**2411**	**7694**	**100.0%**	**31.3%**	**31.3%**

Indications for Caesarean Section by Pathway to Delivery

Tables 1 and 2 show the indications for CS within the TGCS. A different classification is used for pre labour CS and those carried out after either spontaneous or induced labour. A great deal of effort is needed to ensure that the classification is correctly applied and the data validated and quality controlled. In these tables although the quality is good there remain discrepancies which we continue to seek to improve.

Table 1: Spontaneous/Induced Caesarean Section Reason 804/7964 (10.1%)

	Total	Fetal reason (no oxytocin)	% of Group	IUA - Inability to treat fetal intolerance	% of Group	IUA - Inability to treat over contracting	% of Group	IUA - Poor response	% of Group	IUA - No oxytocin given	% of Group	EUA - Persistent malposition	% of Group	EUA - Cephalopelvic disproportion	% of Group	Total
Group 1	1322	35	3%	42	3%	3	0%	38	3%	1	0%	15	1%	3	0%	137
Group 2	1527	76	5%	142	9%	4	0%	165	11%	16	1%	25	2%	8	1%	436
Group 2a	1318	76	6%	142	11%	4	0%	165	13%	16	1%	25	2%	8	1%	436
Group 2b	209	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Group 3	1700	10	1%	3	0%	0	0%	3	0%	2	0%	5	0%	0	0%	23
Group 4	1281	19	1%	13	1%	2	0%	14	1%	5	0%	3	0%	3	0%	59
Group 4a	1160	19	2%	13	1%	2	0%	14	1%	5	0%	3	0%	3	0%	59
Group 4b	121	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Group 5	1041	24	2%	9	1%	0	0%	7	1%	24	2%	1	0%	2	0%	67
Group 6	181	23	13%	0	0%	0	0%	1	1%	0	0%	4	2%	0	0%	28
Group 7	120	7	6%	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%	8
Group 8	156	11	7%	1	1%	1	1%	6	4%	1	1%	1	1%	0	0%	21
Group 9	40	3	8%	0	0%	0	0%	1	3%	0	0%	0	0%	0	0%	4
Group 10	326	9	3%	4	1%	0	0%	6	2%	1	0%	0	0%	1	0%	21
Total	**7694**	**217**	**2.8%**	**214**	**2.8%**	**10**	**0.1%**	**241**	**3.1%**	**50**	**0.6%**	**55**	**0.7%**	**17**	**0.2%**	**804**

Table 2: Pre-labour Caesarean Section Reason: 1616/7964 (20.3%)

	Total Women in the group	Fetal reason	% of Group	Maternal medical reason/ pains	% of Group	Non medical reason/ patient request	% of Group	PET/ Hypertension	% of Group	Postdates	% of Group	Previous caesarean section	% of Group	SROM	% of Group	Total sections in group
Group 1	1322	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Group 2	1527	78	5%	78	5%	43	3%	8	1%	1	0%	2	0%	0	0%	210
Group 2a	1318	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Group 2b	209	78	37%	78	37%	43	21%	8	4%	1	0%	2	1%	0	0%	210
Group 3	1700	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Group 4	1281	26	2%	68	5%	28	2%	0	0%	0	0%	0	0%	0	0%	122
Group 4a	1160	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Group 4b	121	26	21%	68	56%	28	23%	0	0%	0	0%	0	0%	0	0%	122
Group 5	1041	49	5%	24	2%	9	1%	4	0%	1	0%	697	67%	9	1%	793
Group 6	181	136	75%	3	2%	0	0%	3	2%	0	0%	1	1%	2	1%	145
Group 7	120	65	54%	5	4%	1	1%	0	0%	0	0%	26	22%	5	4%	102
Group 8	156	61	39%	1	1%	4	3%	7	4%	0	0%	10	6%	2	1%	85
Group 9	40	22	55%	4	10%	2	5%	0	0%	0	0%	7	18%	1	3%	36
Group 10	326	67	21%	22	7%	0	0%	14	4%	0	0%	16	5%	4	1%	123
Total	**7694**	**504**	**6.6%**	**205**	**2.7%**	**87**	**1.1%**	**36**	**0.5%**	**2**	**0.0%**	**759**	**9.9%**	**23**	**0.3%**	**1616**

Groups 1 and 2

Total single cephalic nulliparous pregnancies at greater than or equal to 37 weeks' gestation (n=2849)

Spontaneous labour	Induced labour	Pre labour C/S
1322/2849 (46.4%)	1318/2849 (46.3%)	209/2849 (7.3%)

Caesarean section contribution according to onset of delivery, in single cephalic nulliparous pregnancies at greater than or equal to 37 weeks' gestation 782/2849 (27.5%)

Spontaneous labour	137/2849	4.8%
Induced labour	436/2849	15.3%
Pre labour C/S	209/2849	7.3%

Group 1

Caesarean section rate of single cephalic nulliparous pregnancies at greater than or equal to 37 weeks gestation in spontaneous labour 137/1322 (10.4%)

IUA - Inability to treat fetal intolerance	42/1322	3.2%
IUA - Poor response	38/1322	2.9%
Fetal reason (no oxytocin)	35/1322	2.6%
EUA - Persistent malposition	15/1322	1.1%
EUA - Cephalopelvic disproportion	3/1322	0.2%
IUA - Inability to treat over contracting	3/1322	0.2%
IUA - No oxytocin given	1/1322	0.1%

Group 1 Events and Outcomes

Group 1	2021		2020	2017	2016	2015
ARM to accelerate	45.8%	606/1322	49.8%	49.9%	52.4%	50.2%
Oxytocin	44.2%	584/1322	53.8%%	47.3%	43.9%	41.8%
Epidural	66.9%	885/1322	76.0%	68.4%	65.9%	66.8%
Electronic monitoring	85.0%	1124/1322	91.4%	92.0%	89.9%	86.0%
Fetal blood sample	8.3%	110/1322	13.1%	18.8%	21.0%	25.2%
Vaginal operative delivery	28.9%	382/1322	29.2%	28.7%	31.3%	27.6%
Apgars <7 at 5 mins	1.1%	14/1322	0.5%	1.0%	1.0%	0.7%
Overall caesarean section	10.4%	137/1322	8.8%	9.0%	7.8%	8.7%
Caesarean section at VE=10	1.3%	17/1322	0.9%	1.5%	1.7%	1.5%
Admitted to Neonatal Unit	8.9%	118/1322	8.6%	18.8%	18.1%	18.6%
Episiotomy	48.8%	645/1322	49.0%	45.7%	49.5%	45.4%
OASIS	2.2%	29/1322	3.0%	2.2%	3.7%	2.3%
*Length of labour >12 hrs	2.8%	37/1322	2.4%	5.1%	3.9%	3.3%
Babies >=4.0kg	12.4%	164/1322	12.2%	12.7%	12.8%	14.0%
Aged >=35	26.5%	350/1322	31.3%	26.6%	23.7%	23.1%
BMI >=30	9.1%	120/1322	9.4%%	8.6%	7.6%	7.9%
PPH >1000mls	3.9%	52/1322	3.4%	2.9%	3.0%	1.9%
HIE	0.0%	0/1322	0.0%	0.1%	0.0%	0.0%
Blood transfusion	2.0%	27/1322	1.6%	2.7%	0.0%	2.1%

Comment: *Some of the events are lower because of the cyber-attack and are not recorded in the database*

Age Range	Number	%
<20	13	1.0%
20 - 24	103	7.8%
25 - 29	224	16.9%
30 - 34	632	47.8%
35 - 39	308	23.3%
>=40	42	3.2%
Unrecorded	0	0.0%
Total	**1322**	

Body Mass Index	Number	%
Underweight: <18.5	19	1.4%
Healthy: 18.5 - 24.9	808	61.1%
Overweight: 25 - 29.9	306	23.1%
Obese class 1: 30 - 34.9	96	7.3%
Obese class 2: 35 - 39.9	20	1.5%
Obese class 3: >40	4	0.3%
Unrecorded	69	5.2%
Total	**1322**	

Birthweight Range	Number	%
Birthweight Range	Number	%
500 - 999 g	0	0.0%
1000 - 1499 g	0	0.0%
1,500 - 1,999 g	0	0.0%
2,000 - 2,499 g	10	0.8%
2,500 - 2,999 g	142	10.7%
3,000 - 3,499 g	551	41.7%
3,500 - 3,999 g	455	34.4%
4,000 - 4,449 g	152	11.5%
4,500 - 4,999 g	12	0.9%
>= 5,000 g	**0**	0.0%
Total	**1322**	

Labour Duration	Number	%
0 - 2 hrs	111	8.4%
2 - 4 hrs	166	12.6%
4 - 6 hrs	239	18.1%
6 - 8 hrs	207	15.7%
8 - 10 hrs	135	10.2%
10 - 12 hrs	60	4.5%
> 12 hrs	37	2.8%
Unrecorded	367	27.8%
Total	**1322**	

Groups 1 & 2 (as the denominator): Single cephalic nulliparous pregnancies at greater than or equal to 37 weeks' gestation. Indications for induction of labour (Group 2(a)) 1318/2849 (46.3%).

Fetal	412/2849	14.5%
SROM not in labour	316/2849	11.1%
Maternal	226/2849	7.9%
Postdates (>40 and less than 42 weeks)	123/2849	4.3%
PET/Hypertension	106/2849	3.7%
Postterm (>= 42 weeks)	92/2849	3.2%
Not recorded	32/2849	1.1%
No medical indication	11/2849	0.4%
Total	**1318/2849**	**46.3%**

Group 2a: Caesarean section rates according to indication for induction in single cephalic nulliparous pregnancies at greater than or equal to 37 weeks gestation 436/1318 33.1%

	Fetal reason (no oxytocin)		IUA - Inability to treat fetal intolerance		IUA - Inability to treat over contracting		IUA - Poor response		IUA - No oxytocin given		EUA - Cephalopelvic disproportion		EUA - Persistent malposition	
Fetal 132/412 (32.0%)	35/412	8.5%	49/412	11.9%	1/412	0.2%	28/412	6.8%	6/412	1.5%	3/412	0.7%	10/412	2.4%
SROM not in labour 111/316 (35.1%)	6/316	1.9%	36/316	11.4%	0/316	0.0%	64/316	20.3%	0/316	0.0%	1/316	0.3%	4/316	1.3%
Maternal 61/226 (27.0%)	6/226	2.7%	19/226	8.4%	0/226	0.0%	28/226	12.4%	3/226	1.3%	0/226	0.0%	5/226	2.2%
Postdates (>40 and less than 42 weeks) 47/123 (38.2%)	12/123	9.8%	10/123	8.1%	1/123	0.8%	15/123	12.2%	4/123	3.3%	2/123	1.6%	3/123	2.4%
PET/Hypertension 28/106 (26.4%)	9/106	8.5%	8/106	7.5%	0/106	0.0%	9/106	8.5%	0/106	0.0%	1/106	0.9%	1/106	0.9%
Postterm (>= 42 weeks) 39/92 (42.4%)	5/92	5.4%	14/92	15.2%	0/92	0.0%	15/92	16.3%	2/92	2.2%	1/92	1.1%	2/92	2.2%
Not recorded 13/32 (40.6%)	3/32	9.4%	4/32	12.5%	0/32	0.0%	6/32	18.8%	0/32	0.0%	0/32	0.0%	0/32	0.0%
No medical indication 3/11 (27.3%)	0/11	0.0%	2/11	18.2%	0/11	0.0%	0/11	0.0%	1/11	9.1%	0/11	0.0%	0/11	0.0%
Total 436/1318 (33.1%)	**76/1318**	**5.8%**	**142/1318**	**10.8%**	**4/1318**	**0.3%**	**165/1318**	**12.5%**	**16/1318**	**1.2%**	**8/1318**	**0.6%**	**25/1318**	**1.9%**

Group 2(a) Events and Outcomes

Group 2(a)	2021		2020	2017	2016	2015
ARM	48.2%	635/1318	52.6%	62.8%	65.9%	60.2%
Prostaglandin/Propess	39.2%	516/1318	50.4%	55.2%	49.7%	46.2%
Oxytocin	70.9%	935/1318	81.3%%	72.1%	71.8%	65.9%
Epidural	73.2%	965/1318	82.8%	91.8%	76.4%	75.5%
Electronic monitoring	87.3%	1150/1318	98.7%	92.6%	92.5%	89.2%
Apgars <7 at 5 mins	1.0%	13/1318	1.6%	1.3%	1.5%	1.4%
Overall caesarean section rate	33.1%	436/1318	33.7%	31.9%	32.6%	33.1%
Caesarean section at VE=10	2.0%	27/1318	1.8%	2.4%	2.5%	2.1%
Admitted to Neonatal Unit	14.0%	184/1318	13.2%	29.8%	30.2%	26.5%
Episiotomy*	39.8%	524/1318	42.0%	40.9%	42.6%	38.3%
OASIS*	1.7%	22/1318	1.6%	1.4%	2.2%	1.6%
Length of labour >12 hrs	4.7%	62/1318	3.8%	9.1%	7.7%	6.7%
Babies >=4.0kg	16.3%	215/1318	17.5%	19.5%	18.1%	19.0%
Aged >=35	36.6%	482/1318	41.5%	32.8%	32.8%	29.7%
BMI >=30	18.5%	244/1318	19.9%%	12.4%	12.4%	14.1%
PPH >1000mls	6.6%	87/1318	6.2%	6.9%	4.7%	4.1%
HIE	0.4%	5/1318	0.3%	0.0%	0.0%	0.0%
Blood transfusion rate	2.2%	29/1318	1.6%	4.2%	0.0%	3.7%

**includes Episiotomy and Sphincter Damage*
Comment: *Some of the events are lower because of the cyber-attack and are not recorded in the database*

Age Range	Number	%
<20	12	0.9%
20 - 24	94	7.1%
25 - 29	212	16.1%
30 - 34	518	39.3%
35 - 39	389	29.5%
>=40	93	7.1%
Unrecorded	0	0.0%
Total	**1318**	

Body Mass Index	Number	%
Underweight: <18.5	22	1.3%
Healthy: 18.5 - 24.9	895	52.6%
Overweight: 25 - 29.9	489	28.8%
Obese class 1: 30 - 34.9	144	8.5%
Obese class 2: 35 - 39.9	44	2.6%
Obese class 3: >40	15	0.9%
Unrecorded	91	5.4%
Total	**1700**	

Birthweight Range	Number	%
500 - 999 g	0	0.0%
1000 - 1499 g	0	0.0%
1,500 - 1,999 g	0	0.0%
2,000 - 2,499 g	5	0.3%
2,500 - 2,999 g	91	5.4%
3,000 - 3,499 g	511	30.1%
3,500 - 3,999 g	750	44.1%
4,000 - 4,449 g	296	17.4%
4,500 - 4,999 g	43	2.5%
>= 5,000 g	4	0.2%
Total	**1700**	

Labour Duration	Number	%
0 - 2 hrs	724	42.6%
2 - 4 hrs	364	21.4%
4 - 6 hrs	136	8.0%
6 - 8 hrs	60	3.5%
8 - 10 hrs	16	0.9%
10 - 12 hrs	8	0.5%
> 12 hrs	6	0.4%
Unrecorded	386	22.7%
Total	**1700**	

Group 2(b): Pre labour caesarean section in single cephalic nulliparous pregnancies at greater than or equal to 37 weeks gestation 209/2849 (7.3%)

Maternal medical reason/pains	78/2849	2.7%
Fetal reason	77/2849	2.7%
Non-medical reason/patient request	43/2849	1.5%
PET/Hypertension	8/2849	0.3%
Previous caesarean section	2/2849	0.1%
Postdates	1/2849	0.0%

Group 3 and 4 Total single cephalic multiparous pregnancies at greater than or equal to 37 weeks gestation (n=2981)

Spontaneous labour	1698/2981	57.0%
Induced labour	1161/2981	38.9%
Pre labour C/S	122/2981	4.1%

Caesarean section contribution according to onset of delivery of single cephalic multiparous pregnancies without a previous section at greater than or equal to 37 weeks' gestation 203/2981 (6.8%)

Spontaneous labour	23/2981	0.8%
Induced labour	58/2981	1.9%
Pre labour C/S	122/2981	4.1%

Group 3 Caesarean section rate of single cephalic multiparous pregnancies without a previous caesarean section at greater than or equal to 37 weeks gestation in spontaneous labour 24/1700 (1.4%)

Fetal reason (no oxytocin)	11/1700	0.6%
EUA - Persistent malposition	5/1700	0.3%
IUA - Inability to treat fetal intolerance	3/1700	0.2%
IUA - Poor response	3/1700	0.2%
IUA - No oxytocin given	2/1700	0.1%

Group 3 Events and Outcomes

Group 3	2021		2020	2017	2016	2015
ARM to accelerate	46.4%	788/1700	51.8%	53.2%	53.0%	54.4%
Oxytocin	3.8%	64/1700	3.6%%	2.7%	2.0%	2.9%
Epidural	37.9%	645/1700	39.8%	34.1%	31.5%	29.8%
Electronic monitoring	74.4%	1264/1700	77.6%	73.6%	69.4%	63.6%
Fetal blood sample	0.8%	13/1700	2.1%	3.2%	3.3%	4.9%
Vaginal operative delivery	3.7%	63/1700	3.3%	3.5%	5.0%	3.7%
Apgars <7 at 5 mins	0.3%	5/1700	1.5%	0.3%	0.3%	0.2%
Cord pH <7.0	-	-	-	0.2%	0.3%	0.2%
Overall caesarean section rate	1.4%	23/1700	0.7%	1.3%	1.0%	1.6%
Caesarean section at VE=10	0.2%	3/1700	0.0%	0.3%	0.3%	0.3%
Admitted to Neonatal Unit	4.7%	80/1700	6.1%	8.8%	6.2%	7.0%
Episiotomy*	10.2%	174/1700	8.1%	6.2%	6.7%	6.4%
OASIS*	1.1%	18/1700	1.0%	0.2%	1.0%	0.9%
Length of labour >12 hrs	0.4%	6/1700	1.2%	0.3%	0.3%	0.2%
Babies >=4.0kg	20.1%	343/1700	21.1%	23.9%	21.7%	24.7%
Aged >=35	56.5%	961/1700	59.9%	53.1%	49.4%	44.5%
BMI >=30	11.9%	203/1700	12.6%%	10.7%	10.0%	10.4%
PPH >1000mls	2.0%	34/1700	1.2%	1.6%	1.3%	0.8%
HIE	0.1%	1/1700	0.0%	0.0%	0.0%	0.0%
Blood transfusion rate	0.4%	7/1700	0.7%	0.4%	0.0%	0.8%

**includes Episiotomy and Sphincter Damage*
Comment: *Some of the events are lower because of the cyber-attack and are not recorded in the database*

Age Range	Number	%
<20	0	0.0%
20 - 24	35	2.1%
25 - 29	174	10.2%
30 - 34	530	31.2%
35 - 39	814	47.9%
>=40	147	8.6%
Unrecorded	0	0.0%
Total	**1700**	

Body Mass Index	Number	%
Underweight: <18.5	22	1.3%
Healthy: 18.5 - 24.9	895	52.6%
Overweight: 25 - 29.9	489	28.8%
Obese class 1: 30 - 34.9	144	8.5%
Obese class 2: 35 - 39.9	44	2.6%
Obese class 3: >40	15	0.9%
Unrecorded	91	5.4%
Total	**1700**	

Birthweight Range	Number	%
500 - 999 g	0	0.0%
1000 - 1499 g	0	0.0%
1,500 - 1,999 g	0	0.0%
2,000 - 2,499 g	5	0.3%
2,500 - 2,999 g	91	5.4%
3,000 - 3,499 g	511	30.1%
3,500 - 3,999 g	750	44.1%
4,000 - 4,449 g	296	17.4%
4,500 - 4,999 g	43	2.5%
>= 5,000 g	4	0.2%
Total	**1700**	

Labour Duration	Number	%
0 - 2 hrs	724	42.6%
2 - 4 hrs	364	21.4%
4 - 6 hrs	136	8.0%
6 - 8 hrs	60	3.5%
8 - 10 hrs	16	0.9%
10 - 12 hrs	8	0.5%
> 12 hrs	6	0.4%
Unrecorded	386	22.7%
Total	**1700**	

Group 3 and 4 (as the denominator): Single cephalic multiparous pregnancies section at greater than or equal to 37 weeks' gestation. Indications for induction of labour 1160/2981 (38.9%).

Fetal	393/2981	13.2%
Maternal	315/2981	10.6%
SROM not in labour	166/2981	5.6%
Postdates (>40 and less than 42 weeks)	96/2981	3.2%
Postterm (>= 42 weeks)	64/2981	2.1%
No medical indication	54/2981	1.8%
PET/Hypertension	43/2981	1.4%
Not recorded	29/2981	1.0%
Total	**1160/2981**	**38.9%**

Group 4(a) Caesarean section rates according to indication for induction in single cephalic multiparous pregnancies without a previous caesarean section at greater than or equal to 37 weeks' gestation 57/1160 (4.9%).

	Fetal reason (no oxytocin)		IUA - Inability to treat fetal intolerance		IUA - Inability to treat over contracting		IUA - Poor response		IUA - No oxytocin given		EUA - Cephalopelvic disproportion		EUA - Persistent malposition	
Fetal 18/393 (4.6%)	7/393	1.8%	4/393	1.0%	1/393	0.3%	3/393	0.8%	1/393	0.3%	0/393	0.0%	2/393	0.5%
Maternal 7/315 (2.2%)	3/315	1.0%	0/315	0.0%	0/315	0.0%	3/315	1.0%	1/315	0.3%	0/315	0.0%	0/315	0.0%
SROM not in labour 0/54 (0.0%)	0/166	0.0%	6/166	3.6%	1/166	0.6%	6/166	3.6%	0/166	0.0%	1/166	0.6%	1/166	0.6%
Postdates (>40 and less than 42 weeks) 3/43 (7.0%)	1/96	1.0%	1/96	1.0%	0/96	0.0%	0/96	0.0%	2/96	2.1%	1/96	1.0%	0/96	0.0%
Postterm (>= 42 weeks) 5/96 (5.2%)	5/64	7.8%	1/64	1.6%	0/64	0.0%	0/64	0.0%	0/64	0.0%	0/64	0.0%	0/64	0.0%
No medical indication 6/64 (9.4%)	0/54	0.0%	0/54	0.0%	0/54	0.0%	0/54	0.0%	0/54	0.0%	0/54	0.0%	0/54	0.0%
PET/Hypertension 15/166 (9.0%)	1/43	2.3%	1/43	2.3%	0/43	0.0%	0/43	0.0%	0/43	0.0%	1/43	2.3%	0/43	0.0%
Not recorded 3/29 (10.3%)	0/29	0.0%	0/29	0.0%	0/29	0.0%	2/29	6.9%	1/29	3.4%	0/29	0.0%	0/29	0.0%
Total 57/1160 (4.9%)	**17/1160**	**1.5%**	**13/1160**	**1.1%**	**2/1160**	**0.2%**	**14/1160**	**1.2%**	**5/1160**	**0.4%**	**3/1160**	**0.3%**	**3/1160**	**0.3%**

Group 4(a) Events and Outcomes

Group 4(a)	2021		2020	2017	2016	2015
ARM	65.7%	762/1160	77.1%	75.6%	84.7%	80.4%
Prostaglandin/Propess	36.8%	427/1160	N/A	45.8%	34.6%	30.1%
Oxytocin	44.3%	514/1160	49.1%	32.5%	32.1%	30.6%
Epidural	57.7%	669/1160	60.7%	52.0%	51.4%	52.5%
Electronic monitoring	87.0%	1009/1160	98.7%	92.5%	90.8%	90.7%
Fetal blood sample	2.4%	28/1160	5.7%	8.0%	6.8%	12.2%
Vaginal operative delivery	6.6%	76/1160	5.8%	5.5%	5.7%	7.6%
Apgars <7 at 5 mins	0.5%	6/1160	0.7%	0.7%	0.8%	0.9%
Cord pH <7.0	-	-	-	0.5%	0.2%	0.0%
Overall caesarean section rate	5.0%	58/1160	5.1%	4.8%	4.4%	5.7%
Caesarean section at VE=10	0.3%	4/1160	0.2%	0.4%	0.2%	0.7%
Admitted to Neonatal Unit	9.4%	109/1160	11.1%	16.7%	14.4%	12.4%
Episiotomy*	12.5%	145/1160	10.3%	7.9%	8.5%	9.4%
OASIS*	0.6%	7/1160	0.6%	0.5%	1.2%	0.1%
Length of labour >12 hrs	0.7%	8/1160	1.3%	0.6%	0.9%	0.9%
Babies >=4.0kg	25.7%	298/1160	25.1%	25.6%	26.3%	27.1%
Aged >=35	62.6%	726/1160	64.4%	53.4%	52.8%	53.7%
BMI >=30	20.0%	232/1160	22.2%	14.6%	14.4%	14.8%
PPH >1000mls	2.5%	29/1160	2.1%	2.7%	2.7%	1.6%
HIE	0.0%	0/1160	0.0%	0.1%	0.0%	0.0%
Blood transfusion rate	0.3%	4/1160	0.6%	1.1%	0.0%	1.2%

**includes Episiotomy and Sphincter Damage*
Comment: *Some of the events are lower because of the cyber-attack and are not recorded in the database*

Age Range	Number	%
<20	2	0.2%
20 - 24	26	2.2%
25 - 29	79	6.8%
30 - 34	327	28.2%
35 - 39	529	45.6%
>=40	197	17.0%
Unrecorded	0	0.0%
Total	**1160**	

Body Mass Index	Number	%
Underweight: <18.5	6	0.5%
Healthy: 18.5 - 24.9	485	41.8%
Overweight: 25 - 29.9	346	29.8%
Obese class 1: 30 - 34.9	157	13.5%
Obese class 2: 35 - 39.9	51	4.4%
Obese class 3: >40	24	2.1%
Unrecorded	91	7.8%
Total	**1160**	

Birthweight Range	Number	%
500 - 999 g	0	0.0%
1000 - 1499 g	0	0.0%
1,500 - 1,999 g	0	0.0%
2,000 - 2,499 g	8	0.7%
2,500 - 2,999 g	85	7.3%
3,000 - 3,499 g	332	28.6%
3,500 - 3,999 g	437	37.7%
4,000 - 4,449 g	244	21.0%
4,500 - 4,999 g	50	4.3%
>= 5,000 g	4	0.3%
Total	**1160**	

Labour Duration	Number	%
0 - 2 hrs	302	26.0%
2 - 4 hrs	240	20.7%
4 - 6 hrs	180	15.5%
6 - 8 hrs	82	7.1%
8 - 10 hrs	46	4.0%
10 - 12 hrs	17	1.5%
> 12 hrs	8	0.7%
Unrecorded	285	24.6%
Total	**1160**	

Group 4(b)

Pre labour caesarean section in single cephalic multiparous pregnancies at greater than or equal to 37 weeks without a previous caesarean section 122/2981 (4.1%)

Maternal medical reason	69/2981	2.3%
Non-medical reasons	28/2981	0.9%
Fetal reasons	25/2981	0.8%

Comment: The induction rate in single cephalic multiparous women without a previous caesarean section at term is 36.8%. This is high and a change of clinical practice partly at least as a result of changing epidemiological variables. The clinical impact in terms of other outcomes is less significant than in nulliparous women.

Group 5: Single cephalic multiparous pregnancies (with at least one previous caesarean section) at greater than or equal to 37 weeks' gestation (n=1041)

Spontaneous Labour	Induced Labour	Pre labour C/S
187/1041	60/1041	794/1041
18.0%	5.8%	76.3%

Caesarean Section contribution according to onset of delivery in single cephalic multiparous pregnancies with at least one previous section at greater than or equal to 37 weeks' gestation: (858/1041) (82.4%)

Spontaneous Labour	Induced Labour	Pre labour C/S
34/1041	30/1041	794/1041
3.3%	2.9%	76.3%

Group 5 All

Events and Outcomes

Group 5 Overall	2021		2020	2017	2016	2015
ARM	10.5%	109/1041	15.6%	31.7%	21.8%	20.8%
Prostaglandin/Propess	0.0%	0/0	0.0%	0.0%	0.2%	0.2%
Oxytocin	2.6%	27/1041	3.4%	2.1%	2.4%	2.3%
Epidural	14.1%	147/1041	16.5%	17.8%	20.8%	19.8%
Electronic monitoring	36.4%	379/1041	46.0%	31.5%	38.2%	36.4%
Fetal blood sample	0.1%	1/1041	0.3%	1.6%	2.5%	2.4%
Vaginal operative delivery	4.3%	45/1041	5.3%	5.8%	5.1%	4.9%
Apgars <7 at 5 mins	0.2%	2/1041	1.1%	0.8%	0.2%	0.2%
Cord pH < 7.0	-	-	-	0.3%	1.5%	1.4%
Overall caesarean section rate	82.4%	858/1041	80.9%	75.9%	62.5%	59.6%
Caesarean section at VE=10	0.2%	2/1041	0.4%	0.4%	0.6%	0.5%
Admitted to Neonatal Unit	8.8%	92/1041	11.3%	13.6%	11.2%	12.7%
Episiotomy*	6.7%	70/1041	9.0%	9.0%	9.1%	8.7%
OASIS*	0.5%	5/1041	0.3%	0.5%	0.9%	0.9%
Length of labour >12 hrs	0.2%	2/1041	0.2%	0.9%	0.8%	0.8%
Babies >=4.0kg	16.9%	176/1041	19.5%	19.9%	20.3%	19.4%
Aged >=35	66.6%	693/1041	67.5%	66.0%	60.9%	59.7%
BMI >=30	26.7%	278/1041	21.2%	20.3%	18.7%	17.2%
PPH >1000mls	2.7%	28/1041	2.2%	2.3%	2.2%	2.1%
HIE	0.0%	0/1041	0.0%	0.0%	0.0%	0.0%
Blood transfusion rate	0.9%	9/1041	4.2%	2.0%	0.0%	2.4%

**includes Episiotomy and Sphincter Damage (2*
Comment: *Some of the events are lower because of the cyber-attack and are not recorded in the database*

Group 5 All

Age Range	Number	%
<20	1	0.1%
20 - 24	18	1.7%
25 - 29	49	4.7%
30 - 34	281	27.0%
35 - 39	519	49.9%
>=40	174	16.7%
Unrecorded	0	0.0%
Total	**1041**	

Body Mass Index	Number	%
Underweight: <18.5	6	0.6%
Healthy: 18.5 - 24.9	418	40.2%
Overweight: 25 - 29.9	292	28.0%
Obese class 1: 30 - 34.9	163	15.7%
Obese class 2: 35 - 39.9	55	5.3%
Obese class 3: >40	30	2.9%
Unrecorded	77	7.4%
Total	**1041**	

Birthweight Range	Number	%
500 - 999 g	1	0.1%
1000 - 1499 g	0	0.0%
1,500 - 1,999 g	0	0.0%
2,000 - 2,499 g	12	1.2%
2,500 - 2,999 g	79	7.6%
3,000 - 3,499 g	378	36.3%
3,500 - 3,999 g	395	37.9%
4,000 - 4,449 g	138	13.3%
4,500 - 4,999 g	29	2.8%
>= 5,000 g	9	0.9%
Total	**1041**	

Labour Duration	Number	%
0 - 2 hrs	41	3.9%
2 - 4 hrs	38	3.7%
4 - 6 hrs	34	3.3%
6 - 8 hrs	16	1.5%
8 - 10 hrs	8	0.8%
10 - 12 hrs	3	0.3%
> 12 hrs	2	0.2%
Unrecorded	899	86.4%
Total	**1041**	

Group 5(a)

Caesarean section rate of single cephalic pregnancies with only one previous caesarean section, at greater than or equal to 37 weeks gestation in spontaneous labour 34/187 (18.2 %)

Fetal reason (no oxytocin)	15/187	8.0%
IUA - No oxytocin given	13/187	7.0%
IUA - Inability to treat fetal intolerance	3/187	1.6%
EUA - Cephalopelvic disproportion	2/187	1.1%
IUA - Poor response	1/187	0.5%
EUA - Persistent malposition	0/187	0%
IUA - Inability to treat over contracting	0/187	0%

Group 5a Spontaneous Labour

Events and Outcomes

	2021		2020	2017	2016	2015
ARM	39.0%	73/187	49.7%	48.4%	45.8%	49.2%
Oxytocin	4.8%	9/187	2.7%	3.9%	2.6%	3.8%
Epidural	55.1%	103/187	56.2%	51.2%	49.8%	54.2%
Electronic monitoring	82.4%	154/187	91.9%	94.5%	94.9%	95.6%
Fetal blood sample	0.5%	1/187	0.5%	5.1%	5.1%	7.8%
Vaginal operative delivery	19.8%	37/187	22.7%	18.8%	19.4%	16.3%
Apgars <7 at 5 mins	0.0%	0/187	0.5%	2.3%	0.7%	0.0%
Cord pH <7.0	-	-	-	0.4%	0.0%	0.3%
Overall caesarean section rate	18.2%	34/187	18.9%	21.1%	19.4%	21.9%
Caesarean section at VE=10	1.1%	2/187	2.2%	1.2%	1.1%	1.9%
Admitted to Neonatal Unit	10.7%	20/187	9.7%	17.6%	12.1%	13.5%
Episiotomy*	33.7%	63/187	38.9%	29.3%	26.7%	26.6%
Length of labour >12 hrs	0.5%	1/187	0.5%	1.6%	0.7%	1.3%
Babies >=4.0kg	15.0%	28/187	18.9%	21.9%	19.0%	20.1%
Aged >=35	61.0%	114/187	60.5%	57.4%	53.8%	55.5%
BMI >=30	14.4%	27/187	16.8%	16.0%	15.0%	12.9%
PPH >1000mls	3.7%	7/187	3.8%	5.5%	3.7%	3.4%
HIE	0.0%	0/187	0.0%	0.0%	0.0%	0.0%
Blood transfusion rate	1.6%	3/187	2.7%	4.3%	0.0%	4.1%

**includes Episiotomy and Sphincter Damage*
Comment: *Some of the events are lower because of the cyber-attack and are not recorded in the database*

Age Range	Number	%
<20	0	0.0%
20 - 24	6	3.2%
25 - 29	12	6.4%
30 - 34	55	29.4%
35 - 39	90	48.1%
>=40	24	12.8%
Unrecorded	0	0.0%
Total	**187**	

Body Mass Index	Number	%
Underweight: <18.5	0	0.0%
Healthy: 18.5 - 24.9	89	47.6%
Overweight: 25 - 29.9	64	34.2%
Obese class 1: 30 - 34.9	22	11.8%
Obese class 2: 35 - 39.9	2	1.1%
Obese class 3: >40	3	1.6%
Unrecorded	7	3.7%
Total	**187**	**1**

Birthweight Range	Number	%
500 - 999 g	1	0.5%
1000 - 1499 g	0	0.0%
1,500 - 1,999 g	0	0.0%
2,000 - 2,499 g	2	1.1%
2,500 - 2,999 g	12	6.4%
3,000 - 3,499 g	70	37.4%
3,500 - 3,999 g	74	39.6%
4,000 - 4,449 g	26	13.9%
4,500 - 4,999 g	2	1.1%
>= 5,000 g	0	0.0%
Total	**187**	

Labour Duration	Number	%
0 - 2 hrs	35	18.7%
2 - 4 hrs	33	17.6%
4 - 6 hrs	28	15.0%
6 - 8 hrs	13	7.0%
8 - 10 hrs	4	2.1%
10 - 12 hrs	1	0.5%
> 12 hrs	1	0.5%
Unrecorded	72	38.5%
Total	**187**	

Group 5(b) Single cephalic multiparous pregnancies with only one previous caesarean section at greater than or equal to 37 weeks gestation. Indications for induction of labour 60/1041 (5.8%)

Maternal	24/187	12.8%
SROM not in labour	16/187	8.6%
Postdates (>40 and less than 42 weeks)	6/187	3.2%
Postterm (>= 42 weeks)	5/187	2.7%
Fetal	4/187	2.1%
Not recorded	3/187	1.6%
No medical indication	1/187	0.5%
PET/Hypertension	1/187	0.5%

Caesarean Section Rates according to Indication for Induction in Single Cephalic Multiparous Pregnancies with a previous Caesarean Section at greater than or equal to 37 weeks gestation 30/60 (50%)

	Fetal reason (no oxytocin)		IUA - Inability to treat fetal intolerance		IUA - Inability to treat over contracting		IUA - Poor response		IUA - No oxytocin given		EUA - Cephalopelvic disproportion		EUA - Persistent malposition	
Maternal 14/24 (58.3%)	3/24	12.5%	2/24	8.3%	0/24	0.0%	1/24	4.2%	7/24	29.2%	0/24	0.0%	1/24	4.2%
SROM not in labour 10/16 (62.5%)	0/16	0.0%	4/16	25.0%	0/16	0.0%	5/16	31.3%	1/16	6.3%	0/16	0.0%	0/16	0.0%
Fetal 2/6 (33.3%)	2/6	33.3%	0/6	0.0%	0/6	0.0%	0/6	0.0%	0/6	0.0%	0/6	0.0%	0/6	0.0%
Not recorded 1/5 (20.0%)	0/5	0.0%	0/5	0.0%	0/5	0.0%	0/5	0.0%	1/5	20.0%	0/5	0.0%	0/5	0.0%
No medical indication 1/4 (25.0%)	0/4	0.0%	0/4	0.0%	0/4	0.0%	0/4	0.0%	1/4	25.0%	0/4	0.0%	0/4	0.0%
Postdates (>40 and less than 42 weeks) 1/3 (33.3%)	0/3	0.0%	0/3	0.0%	0/3	0.0%	0/3	0.0%	1/3	33.3%	0/3	0.0%	0/3	0.0%
Postterm (>= 42 weeks) 1/1 (100.0%)	1/1	100.0%	0/1	0.0%	0/1	0.0%	0/1	0.0%	0/1	0.0%	0/1	0.0%	0/1	0.0%
Total 30/60 (50.0%)	**6/60**		**6/60**		**0/0**		**6/60**		**11/60**		**0/0**		**1/60**	

Group 10 by Onset and Gestation

	Spontaneous labour	Induced labour	Pre labour	Total
21	1	0	0	1
22	0	0	0	0
23	4	1	0	5
24	2	2	0	4
25	1	0	2	3
26	1	1	3	5
27	0	0	2	2
28	0	2	4	6
29	2	1	5	8
30	4	1	9	14
31	4	1	7	12
32	5	1	10	16
33	4	1	9	14
34	17	1	20	38
35	33	7	14	54
36	72	34	38	144
Total	**150**	**53**	**123**	**326**

**includes Episiotomy and Sphincter Damage*

All deliveries equal to or less than 36 weeks gestational age by onset and gestation

	Spontaneous labour	Induced labour	Pre labour C-Section	Total
21	1	0	0	1
22	1	0	0	1
23	6	4	0	10
24	7	4	2	13
25	2	2	5	9
26	3	1	6	10
27	2	0	5	7
28	1	3	6	10
29	2	1	8	11
30	6	1	12	19
31	6	1	12	19
32	14	1	19	34
33	5	2	18	25
34	27	2	31	60
35	39	7	27	73
36	79	38	59	176
Total	**201**	**67**	**210**	**478**

Incidence of preterm delivery <37 weeks = 478/7694 (6.2%)
Incidence of preterm spontaneous labour <34 weeks = 56/7694 (0.7%)
Incidence of preterm spontaneous labour <=34 wks = 83/7694 (1.1%)

Age Range by Group

	Group 1		Group 2a		Group 3		Group 4a		Group 5 Overall		Group 5a	
<20	13	1.0%	12	0.9%	0	0.0%	2	0.2%	1	0.1%	0	0.0%
20 - 24	103	7.8%	94	7.1%	35	2.1%	26	2.2%	18	1.7%	6	3.2%
25 - 29	224	16.9%	212	16.1%	174	10.2%	79	6.8%	49	4.7%	12	6.4%
30 -34	632	47.8%	518	39.3%	530	31.2%	327	28.2%	281	27.0%	55	29.4%
35 - 39	308	23.3%	389	29.5%	814	47.9%	529	45.6%	518	49.8%	90	48.1%
>=40	42	3.2%	93	7.1%	147	8.6%	197	17.0%	174	16.7%	24	12.8%
	1322		**1318**		**1700**		**1160**		**1041**		**187**	

Body Mass Index Range by Group

	Group 1		Group 2a		Group 3		Group 4a		Group 5 Overall		Group 5a	
< 18.5	19	1.4%	22	1.7%	22	1.3%	6	0.5%	6	0.6%	0	0.0%
18.5-24.9	808	61.1%	585	44.4%	895	52.6%	485	41.8%	418	40.2%	89	47.6%
25-29.9	306	23.1%	388	29.4%	489	28.8%	346	29.8%	292	28.0%	64	34.2%
30-34.9	96	7.3%	146	11.1%	144	8.5%	157	13.5%	163	15.7%	22	11.8%
35-39.9	20	1.5%	70	5.3%	44	2.6%	51	4.4%	55	5.3%	2	1.1%
>=40	4	0.3%	28	2.1%	15	0.9%	24	2.1%	30	2.9%	3	1.6%
Unrecorded	69	5.2%	79	6.0%	91	5.4%	91	7.8%	77	7.4%	7	3.7%
Total	**1322**		**1318**		**1700**		**1160**		**1041**		**187**	

Birthweight Range by Group

	Group 1		Group 2a		Group 3		Group 4a		Group 5 Overall		Group 5a	
1. 500 - 999 g	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.1%	1	0.5%
2. 1,000 - 1,499 g	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
3. 1,500 - 1,999 g	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
4. 2,000 - 2,499 g	10	0.8%	28	2.1%	5	0.3%	8	0.7%	12	1.2%	2	1.1%
5. 2,500 - 2,999 g	142	10.7%	130	9.9%	91	5.4%	85	7.3%	79	7.6%	12	6.4%
6. 3,000 - 3,499 g	551	41.7%	439	33.3%	511	30.1%	332	28.6%	378	36.3%	70	37.4%
7. 3,500 - 3,999 g	455	34.4%	506	38.4%	750	44.1%	437	37.7%	395	37.9%	74	39.6%
8. 4,000 - 4,499 g	152	11.5%	178	13.5%	296	17.4%	244	21.0%	138	13.3%	26	13.9%
9. 4,500 - 4,999 g	12	0.9%	31	2.4%	43	2.5%	50	4.3%	29	2.8%	2	1.1%
10. 5,000 g -	0	0.0%	6	0.5%	4	0.2%	4	0.3%	9	0.9%	0	0.0%
Total	**1322**		**1318**		**1700**		**1160**		**1041**		**187**	

Labour Duration Range by Group

	Group 1		Group 2a		Group 3		Group 4a		Group 5 Overall		Group 5a	
0 - 2hrs	111	8.4%	56	4.2%	724	42.6%	302	26.0%	41	3.9%	35	18.7%
2 - 4hrs	166	12.6%	72	5.5%	364	21.4%	240	20.7%	38	3.7%	33	17.6%
4 - 6hrs	239	18.1%	129	9.8%	136	8.0%	180	15.5%	34	3.3%	28	15.0%
6 - 8hrs	207	15.7%	189	14.3%	60	3.5%	82	7.1%	16	1.5%	13	7.0%
8 - 10hrs	135	10.2%	124	9.4%	16	0.9%	46	4.0%	8	0.8%	4	2.1%
10 - 12hrs	60	4.5%	95	7.2%	8	0.5%	17	1.5%	3	0.3%	1	0.5%
>12hrs	37	2.8%	62	4.7%	6	0.4%	8	0.7%	2	0.2%	1	0.5%
Not Recorded	367	27.8%	591	44.8%	386	22.7%	285	24.6%	899	86.4%	72	38.5%
Total	**1322**		**1318**		**1700**		**1160**		**1041**		**187**	

Body mass index and labour duration is not always recorded and is a data quality issue

Episiotomy Rate by Group

Group 1	Group 2a	Group 3	Group 4a	Group 5
645/1322	524/1318	174/1700	145/1160	60/1041
48.8%	39.8%	10.2%	12.5%	5.8%

Ten groups by Estimated Blood Loss >1000mls and >1500mls

	EBL >1000mls	Total in Group	Rate
Group 1	52	1322	3.9%
Group 2	101	1527	6.6%
Group 2a	87	1318	6.6%
Group 2b	14	209	6.7%
Group 3	34	1700	2.0%
Group 4		1281	0.0%
Group 4a	29	1160	2.5%
Group 4b	7	121	5.8%
Group 5 all	28	1041	2.7%
Group 5a	2	187	1.1%
Group 6	5	181	2.8%
Group 7	9	120	7.5%
Group 8	19	156	12.2%
Group 9	2	40	5.0%
Group 10	23	326	7.1%
Total	**309**	**7694**	**4.0%**

	EBL >1500mls	Total in Group	Rate
Group 1	15	1322	1.1%
Group 2	32	1527	2.1%
Group 2a	28	1318	2.1%
Group 2b	4	209	1.9%
Group 3	9	1700	0.5%
Group 4	8	1281	0.6%
Group 4a	7	1160	0.6%
Group 4b	1	121	0.8%
Group 5 all	13	1041	1.2%
Group 5a	1	187	0.5%
Group 6	0	181	0.0%
Group 7	5	120	4.2%
Group 8	10	156	6.4%
Group 9	2	40	5.0%
Group 10	8	326	2.5%
Total	**102**	**7694**	**1.3%**

Transfusion Rates per Robson Ten Group

	1	2a	2b	3	4a	4b	5a	5b	5c	6	7	8	9	10	Total
Total in Group	1322	1318	209	1700	1160	121	187	60	794	181	120	156	40	326	7694
Number Transfused	27	29	2	7	4	0	3	0	6	2	2	5	0	10	97
% Transfused	2.0%	2.2%	1.0%	0.4%	0.3%	0.0%	1.6%	0.0%	0.8%	1.1%	1.7%	3.2%	0.0%	3.1%	1.3%
															0
Units crossmatched	74	130	72	79	91	44	32	0	129	25	30	72	16	347	1141
Units Transfused	40	47	7	12	17	0	8	0	12	2	3	20	0	26	194
Patients transfused 4 or more units	0	1	1	0	2	0	1	0	1	0	0	1	0	2	9
% Patients transfused 4 or more units (group)	0.0%	0.1%	0.5%	0.0%	0.2%	0.0%	0.5%	0.0%	0.1%	0.0%	0.0%	0.6%	0.0%	0.6%	0.1%
% Patients transfused who received 4 or more units	0.0%	3.4%	50.0%	0.0%	50.0%	0.0%	33.3%	0.0%	16.7%	0.0%	0.0%	20.0%	0.0%	20.0%	9.3%

Transfusion Rates per Robson Ten Group where EBL >1000mls

Group	1	2a	2b	3	4a	4b	5a	5b	5c	6	7	8	9	10	Total
Number	52	87	14	34	29	7	7	1	20	5	9	19	2	23	309
Number Transfused	16	19	2	6	2	0	2	0	3	1	1	4	0	7	63
% Transfused	30.8%	21.8%	14.3%	17.6%	6.9%	0.0%	28.6%	0.0%	15.0%	20.0%	11.1%	21.1%	0.0%	30.4%	20.4%
															0
Units crossmatched	33	92	40	55	38	4	25	0	37	7	12	41	4	174	562
Units Transfused	22	33	7	11	15	0	7	0	7	1	1	18	0	23	145
Patients transfused 4 or more units	0	1	1	0	2	0	1	0	1	0	0	1	0	2	9
% Patients transfused 4 or more units (group)	0.0%	1.1%	7.1%	0.0%	6.9%	0.0%	14.3%	0.0%	5.0%	0.0%	0.0%	5.3%	0.0%	8.7%	2.9%
% Patients transfused who received 4 or more units	0.0%	5.3%	50.0%	0.0%	100.0%	0.0%	50.0%	#DIV/0!	33.3%	0.0%	0.0%	25.0%	0.0%	28.6%	14.3%

Severe Maternal Morbidity

Maternal Mortality

There were no maternal deaths in 2021. Similar to 2020, tragically there was one late maternal death (>42 days postnatal, <1 year postnatal) due to metastatic carcinoma diagnosed in pregnancy.

Severe Maternal Morbidity

Data is compiled from a number of sources including the High Dependency Unit Record, Pathology Department, Accreta Group, Haematology team, Maternal Medicine Clinic, Microbiology Department as well as referral Intensive Care Units and Interventional Radiology teams. In early 2022, data from 2021 was again presented at a hospital wide Grand Rounds in order to share learning points for future care and confirm completion of data. I wish to acknowledge the work of Dr Helena Bartels, Dr Eoghan Mooney, Dr Paul Downey, Dr Susan Knowles, Ms Jacinta Byrne, Ms Celine O'Brien and Ms Fionnuala Byrne in compiling and confirming the validity of this information.
We are also very grateful to the hard work of Ms Eve Blake and Mr Philip Mulvey for their work in helping to compile this report as part of a medical research elective as final year medical students in University College Dublin.

The NMH reports all SMM to the National Perinatal Epidemiology Centre for inclusion in a National SMM report. In addition, in 2021 the NMH participated in a national audit on Major Obstetric Haemorrhage.

Morbidity	2021
Major Obstetric Haemorrhage	18
Uterine Rupture	1
Peripartum Hysterectomy	6
Eclampsia	0
Renal / Liver Dysfunction	8
Pulmonary Oedema	4
Acute Respiratory Dysfunction	0
Pulmonary Embolism	3
Cardiac Arrest	0
Coma	0
Cerebral Vascular Accident	1
Status Epilepticus	0
Septic Shock	1
Anaesthetic Problems	1
*ICU/CCU admission	3
Other	4 (3 did not have other SMM)
Interventional Radiology	1
TOTAL	**44 patients 51 SMM events**

Data from January 1st 2021 to December 31st 2021; some women had more than one SMM.
** These admissions conform to the NPEC definition and do not include transfers from other areas of the hospital including the Antenatal Ward, Gynaecology Ward and the Emergency Department.*

Maternal Medicine Service

Paul Lawless and Yasmin Kearns with their newborn baby son AJ.

There is a weekly multidisciplinary clinic for women with medical disorders led by Prof Fionnuala McAuliffe, Prof Mary Higgins, Dr Siobhan Corcoran, Dr Clare O'Connor in conjunction with Dr Karen Murphy, Consultant **Haematologist** and clinic midwives Ms Caroline Brophy, Ms Annabel Murphy, Ms Celine O'Brien, Ms Emma Delaney-Cahill and Ms Jacinta Byrne (haematology midwife). Ms Victoire Hurley, **drug liaison** nurse, advises on women with drug addiction.

There is a monthly combined obstetric – **anaesthetic** review of patients at the clinic with Consultant Anaesthetists Dr Roger McMorrow, Dr Siobhan McGuinness and their team. **Pharmacy** provides advice on the safety of maternal medications during pregnancy and breastfeeding with weekly attendance from Anne Clohessy, Louise Delaney and Benedetta Soldati. During the COVID-19 pandemic we continued to see women as needed in the clinic with HSE pandemic guidelines in place.

Specialist Services

Rheumatology: in 2017 we established a monthly Reproductive Rheumatology Health Service the ROSE clinic. Prof Doug Veale, Dr Aine Gorman (SpR) and Ms Louise Moore attend and women are seen for pre-pregnancy counselling and for pregnancy management. Outputs from the clinic have formed the basis for Dr Kieran Murray's PhD and two clinical research papers from this clinic were published in 2019 and 2020. Our unique care pathway has been presented at national and international meetings and will now form the basis of a national HSE guideline.

In 2021 there were 513 new patients seen in the maternal medical service. Some patients presented with more than one problem.

Hepatology: Prof Aiden McCormick attends on a monthly basis for a joint hepatology clinic.

Gastroenterology: In 2018 we established a joint gastroenterology obstetric service. Dr Juliette Sheridan and her team attend bi-monthly where we co-manage pregnant women with inflammatory bowel disease.

Epilepsy: There is a fortnightly clinic to review pregnant women with epilepsy run by Ms. Sinead Murphy, specialist epilepsy midwife funded by Brainwave. Each woman is seen at least three times during the antenatal period and receive a postnatal telemedicine check. All women receive written information regarding their medication, and are invited to a newly established 'women with epilepsy WWE' private facebook group.

Cardiology: Dr Carla Canniffe was jointly appointed to NMH and St Vincent's University Hospital to provide a service for women with cardiology problems, before, during and after pregnancy. She reviews patients at a monthly joint obstetric clinic at NMH and weekly at SVUH in a dedicated woman's cardiology clinic.

Renal medicine: Dr John Holian commenced a bi-monthly joint obstetric renal clinic in December 2021 to review women with renal disease.

Obstetric Haematology Service: comprises 2 Consultant Haematologists Dr Karen Murphy and Dr Joan Fitzgerald, a 0.5 WTE Haematology Registrar and the haematology midwife Ms Jacinta Byrne. There is a weekly Haematology clinic shared with Maternal Medicine colleagues which provides for women with thrombotic and bleeding problems. This blended team ensures provision of high quality care for this complex group of patients during pregnancy. 2021 was uniquely challenging for all areas of medicine but the long established nature of the Obstetric Haematology service in NMH allowed for modifications in how the service worked for periods of time when the Haematologists were off site and also allowed for swift development of new guidance with respect to COVID-19 and thrombotic risk.

In addition to the numbers recorded below **Jacinta Byrne** reviewed 322 women with family history of venous thromboembolism, reviewed 1,926 results in the virtual anaemia clinic and 2174 results in the virtual thrombocytopenia clinic. Jacinta Byrne finished up at NMH end of December 2021 after many years of dedicated service to take up a new opportunity. We wish her all the very best in the next phase of her career.

Maternal Medicine Midwife Clinic

In 2021 **Celine O'Brien** and **Emma Delaney-Cahill** had 233 visits through the maternal medicine midwife clinic which is a service for women in conjunction with the maternal medicine clinic to review women with stable medical conditions. This gives women access to midwifery care.

The weekly **Maternal Medicine MDT meeting** (organised by Dr Niamh Keating and Dr Maggie O'Brien, and Ms. Celine O'Brien and Ms Emma Delaney-Cahill) continues to be very successful facilitating the development of multidisciplinary individualised patient plans.

In 2021 there were **513 new patients** seen in the maternal medical service. Some patients presented with more than one problem. The main diagnoses and indications for referral to the clinic in 2020 are recorded below (*only one diagnosis per patient*).

In our **pre-pregnancy service,** we saw 36 women and their partners / family members in 2021, in addition to the numbers below. This is service is becoming increasingly popular for women with medical disorders, and we often counsel women and their partners together with the relevant physician.

Haematology	Medical Reason	210
	Previous venous thrombo-embolism	57
	VTE current pregnancy	20
	Anti-phospholipid syndrome	9
	Factor V Leiden mutation	7
	Prothrombin gene mutation	3
	Protein S deficiency	4
	MTHFR	8
	Von Willebrand's Disease	11
	Factor VIII deficiency	6
	Factor IX deficiency	1
	Factor XI deficiency	5
	Family history of haemophilia	2
	Immune thrombocytopenic purpura	10
	Neutrophilia	2
	Low platelets	21
	Essential Thrombocytosis	13
	Platelet storage disease	1
	May Hegglin platelet anomaly	1
	Severe anaemia	7
	Bleeding disorder aetiology not known	4
	Glanzmann's hereditary spherocytosis	1
	Spherocytosis	1
	Beta Thalassemia trait	6
	Hypogammaglobinemia	1
	Haemochromatosis	2
	Hodgkins lymphoma pre-pregnancy	2
	Hodgkins lymphoma in pregnancy	2
	CML pre-pregnancy	1
	Leukemia pre-pregnancy	2
	Acute promyelocytic leukemia	1
	Pre-pregnancy leukemia	1
Infection (excluding COVID-19)		**10**
	HIV	3
	Hepatitis B	4
	Hepatitis C	1
	Lyme disease pre-pregnancy	2

Drug dependency (no hepatitis C)		13
	Methadone in pregnancy	10
	Alcohol in pregnancy	1
	Cannabis in pregnancy	2
Cardiac		**33**
	ASD repaired	1
	PFO	1
	Mitral valve prolapse	2
	Pulmonary valve stenosis mild	3
	Aortic dilatation	1
	Aortic stent post RTA pre-pregnancy	1
	Long QT syndrome	2
	SVT	13
	Atrial fibrillation in pregnancy	2
	CPVT	1
	Wolf Parkinson White	2
	Ebstein's repaired	1
	Cardiomyopathy HOCM + ICD	1
	Dilated cardiomyopathy	1
	Peripartum cardiomyopathy current pregnancy	1
	POTS	1
Gastrointestinal Tract		**33**
	Ulcerative colitis	13
	Crohn's disease	18
	Bariatric surgery - gastric sleeve	1
	Achalasia	1
Liver		**8**
	Liver cirrhosis	1
	Autoimmune hepatitis	1
	Hepatoblastoma	1
	Gilberts syndrome	1
	Alpha 1 anti-trypsin deficiency	1
	Liver transplant	3

CNS		77
	Epilepsy	50
	Idiopathic intracranial hypertension	2
	Multiple sclerosis	19
	Spinal arachnoid cyst	1
	Spinal injury T5	1
	Spina bifida occulta	1
	Cavernous angioma	2
	Trigeminal swannoma	1
Vascular		**26**
	Essential hypertension	8
	Prior brain haemorrhage	3
	Vertebral artery dissection pre-pregnancy	1
	CVA in pregnancy	3
	CVA pre-pregnancy	6
	Cerebral vein thrombosis pre-pregnancy	4
	Sagittal sinus thrombosis	1
Connective tissue disorders		**58**
	Sjögren's disease	6
	Still's Disease	1
	Rheumatoid Arthritis	15
	Ankylosing Spondylitis	5
	SLE	4
	Psoriatic Arthritis	8
	Behçets disease	5
	Inflammatory Arthritis	2
	Fibromyalgia	1
	Cutaneous Lupus	1
	Juvenile arthritis	2
	Undifferentiated Connective Tissue Disease	1
	CREST and Sjogren's disease	1
	Juvenile Onset Linear Scleroderma	1
	Systemic sclerosis	1
	Anti Ro antibody positive only	1
	Hydranitis suppertiva	1
	Autoimmune progesterone hypersensitivity	1
	Ehlers Danlos syndrome	1

Respiratory		15
	Cystic fibrosis	5
	Bronchiectasis	1
	Severe asthma	3
	Sarcoidosis	5
	Covid Pneumonitis	1
Renal		**9**
	Renal transplant	2
	Chronic kidney disease stage 2	5
	Lupus nephritis	1
	Horseshoe kidney	1
Oncology		**13**
	Breast Cancer pre-pregnancy	2
	Bowel cancer pre-pregnancy	1
	Thyroid cancer pre-pregnancy	5
	Melanoma in pregnancy	1
	Melanoma pre-pregnancy	1
	Pancreatic cancer in pregnancy	1
	Craniopharyngioma pre-pregnancy	1
	Wilms tumour pre-pregnancy	1
Miscellaneous		**8**
	Silver Russell Syndrome	1
	Bardet Biedl syndrome	1
	Conn's syndrome	1
	Grave's disease	1
	Hyperparathyroidism pre-pregnancy	1
	Hyperparathyroidism in pregnancy	1
	Hypopituitarism	1
	MERRF syndrome	1
Overall Total		**513**

Maternity Outpatient Clinic

Rosie Byrne, Fitzwilliam Clinic Manager and Jennifer Carey, Staff Midwife, Fitzwilliam Clinic and Fetal Medicine Unit.

Activity remains at a high level in both the public Holles Clinic and semi-private Fitzwilliam Clinic.

Holles Clinic

There were over 23,000 new and follow up attendances at the public Holles Clinic this year. There is an increasing interest in our Midwifery-led clinics which increased by 30% in 2021 (n=1,578) compared with 2020 (n=1,210). To meet demand, we provide a Midwifery-led clinic every day as well as Midwifery-led evening clinic.

We continue to improve our midwifery booking appointments at the external Pearse Street Clinic and now provide a formal dating scan in association with our Fetal Medicine colleagues at these appointments. This has increased patient satisfaction of the service.

As the medical complexity of the pregnant women continues to increase, the number of specialist clinics offered by the hospital continues to grow. Specialist clinics include maternal medicine, haematology, pre-term birth, endocrine, diabetes and the pain management clinic. Joint clinics between the Obstetric team and Consultants from St Vincent's University Hospital (SVUH) are offered including cardiology, neurology, rheumatology, respiratory, hepatology and gastroenterology. As part of the multidisciplinary care offered by the hospital, social workers, dieticians, mental health staff and physiotherapists, work as part of the team offering care to the increasing number of mothers with complex medical, mental health and social issues. Despite requiring assisted care, we have dedicated midwifery-led clinics to offer patients midwifery-led care and support in conjunction with their medical

teams. Clinical Midwife Specialist (CMS) Celine O'Brien works alongside the Maternal Medicine obstetric team to offer patients access to midwifery-led care while also meeting their complex medical needs.

A recently established Teen Clinic known as 'The Daisy Clinic' runs alongside a Consultant-led clinic and gives dedicated midwifery care to teenagers during their pregnancy. This is run by CMM1 Lisa Courtney and facilitated by Dr Orla Sheil in partnership with the dietician, social work and education teams.

A clinic offering extra support in the 1st trimester to patients who are pregnant following miscarriage is led by Dr Cathy Allen and the Bereavement Team. This gives extra, necessary care and support to over 50 patients who have come to value this facility in early pregnancy.

The postnatal, 'Poppy Clinic' offers quality and continuity of care to patients who experience complications during the pregnancy and in the postnatal period. Up to 25 mothers are seen in the clinic each week. Referrals are from within the hospital, GPs, PHNs and other maternity hospitals. This is run by Advanced Midwife Practitioner (AMP) Caroline Brophy and Dr Laoise O'Brien and further information can be found in The Postnatal Poppy Clinic section.

Lisa Courtney, CMM1 Holles Clinic .

Dedicated appointment times improve patient flow throughout the clinic. Each booking visit continues to be divided to incorporate a 'virtual' aspect to the appointment in an effort to reduce the amount of time patients were waiting in the department.

Fitzwilliam Clinic

The semi-private Fitzwilliam Clinic also offers antenatal care to expectant women which is located at the front entrance of The National Maternity Hospital on Merrion Square. There were almost 11,000 new and follow up attendances at the Fitzwilliam Clinic during the year. This is a Consultant-led clinic with a dedicated team of Midwives working alongside them. Each patient is booked for a 1st trimester ultrasound booking scan as part of the service. Allocated appointment times continue to work successfully in this department for a number of years. 'Virtual' bookings were introduced this year due to the COVID-19 pandemic with very positive results.

Summary of Obstetric Clinic Attendances

	Holles Clinic	Midwives Clinics	Pearse St Clinics	Specialist Clinics*	Fitzwilliam Clinics	Total
New	3,024	137	409	1300	3,652	8,522
Follow Up	12,949	1441	0	4031	6,947	25,368
Total Attendances	**15973**	**1578**	**409**	**5331**	**10599**	**33,890**

**Diabetes (exc Virtual), Adolescent, Haematology, Postnatal Follow up, Pre-term birth, Endocrinology, Maternal Medicine. Does not include, Community Midwifery, Clinical Nutrition, Satellite or Private Clinics.*

Multiple Pregnancy

Total Mothers Delivered	7694	
Total Babies Born	7855	
Type	**No. of Cases**	**No. of Births***
Twins	149	298
Triplets	5	15
Quads	0	0
Totals	**154**	**313**

	Spontaneous Labour	Induction of Labour	Elective Caesarean Section	Total
Dichorionic Diamniotic % Caesarean Section	30 11/30 (37%)	31 7/31 (23%)	54 54/54(100%)	115 72/115 (63%)
Monochorionic Diamniotic % Caesarean Section	2 1/2 (50%)	6 1/6 (17%)	24 24/24 (100%)	32 26/32 (81%)
Monochorionic Monoamniotic *% Caesarean Section*	*0* *0/0 (0%)*	*0* *0/0 (0%)*	*2* *2/2 (100%)*	*2* *2/2 (100%)*
All Twins % Caesarean Section	32 12/32 (38%)	37 8/37 (22%)	80 80/80 (100%)	149 100/149 (67%)

Multiple Pregnancies per '00 Deliveries	2.00	*(n=154/7694)*

Perinatal Deaths	**Number**
Antepartum Deaths	2
Early Neonatal Deaths	7
Congenital Anomalies	2
Total	**11**

Delivery Method of Perinatal Deaths	**Number**
Caesarean Sections	5
Spontaneous Vaginal	6
Totals	**11**

Perinatal Deaths by Chorionicity*	Number	
Dichorionic Diamniotic	9	*(n=230)*
Perinatal mortality rate per '000 DCDA babies	39.1	
Monochorionic Diamniotic	2	*(n=64)*
Perinatal mortality rate per '000 MCDA babies	31.3	
Monochorionic Monoamniotic	0	*(n=4)*
Perinatal mortality rate per '000 MCMA babies	0	

**Babies born >=500g*

Corrected perinatal rate per '000 twin births	30.2	
Nulliparous Deliveries	69	*(n=3261)*
Incidence per '00 nullip dels	2.1	
Perinatal Deaths	5	
Caesarean Sections	3	
Neonatal Encephalopathy/HIE	0	
Multiparous Deliveries	80	*(n=4433)*
Incidence per '00 multip dels	1.8	
Perinatal Deaths	6	
Caesarean Sections	2	
Neonatal Encephalopathy/HIE	0	

The Fennell Family.

Early Neonatal Death (7)

Case	Chorio-nicity	EGA	BW	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External referral	IUGR	Histology	Cause of death	PM
1	DCDA	24W 1D	610	Female	Spontaneous vaginal	7,5,8	5	NICU	No	No	No abnormal histology reported	E.coli septicaemia with Pulmonary Thromboembolism and Pulmonary Haemorrhage, Extreme Prematurity, ELBW.	Yes
2	DCDA	24W 1D	745	Male	Spontaneous vaginal	7,8,8	5	NICU	No	No	No abnormal histology reported	Early onset E.Coli Sepsis, Extreme Prematurity, ELBW.	No
3	Not stated	24W 4D	800	Male	C-Section	4,7	7	PICU	Yes	No	Hypercoiled cord. Mild MVM.	Extreme prematurity.	No
4	DCDA	23W 6D	550	Female	Spontaneous vaginal		1	DR Death	Yes	No	Ascending infection	Extreme prematurity.	No
5	DCDA	23W 6D	590	Male	Spontaneous breech with MSV		5	NICU	Yes	No	Ascending infection	Extreme prematurity.	
6	DCDA	24+1	695	Female	Spontaneous vaginal	6,8	3	NICU	No	No	Low grade FVM and mild MVM.	Extreme prematurity	No
7	DCDA	24+1	620	Female	Spontaneous vaginal		minutes	DR	No	No	Low grade FVM and mild MVM.	Extreme prematurity	No

Antepartum Stillbirth (2)

Case	Chorionicity	EGA	BW	Gender	Delivery Method	External re-ferral	IUGR	Histology	Cause of death	PM
8	MCDA	35+6	100	Male	C-Section	Yes	n/a	MCDA.	Unexplained	No
9	DCDA	37+1	1350	Female	C-Section	No	Yes	Hypercoiled with strictures and umbilical arterial thrombosis.	Placental dis-ease.	No

Antepartum Stillbirth with Anomalies (1)

Case	Chorio-nicity	EGA	BW	Gender	Delivery Method	External referral	IUGR	Histology	Cause of death	PM
10	MCDA	34+1	1505	Female	C-Section	No	Yes	High grade FVM.	Cardiac anomaly plus hypercoiled cord.	Yes

Congenital Anomaly (1)

Case	Chorio-nicity	EGA	BW	Gender	Delivery method	Apgars (1, 5, 10 mins)	Age at death (days)	Place of death	External referral	IUGR	Histol-ogy	Cause of death	PM
11	DCDA	38+0	2035	Female	C-Section	4,4,4	2	DR Death	No	Yes	SUA.	T18	No

Comment: The twin clinic continued to be busy and provided care to complex cases from all over the country. Preterm delivery was the most common cause of neonatal death. In the section on antepartum stillbirths, in the MCDA pregnancy (case 1) an IUD occurred between 19 and 20 weeks. In this case although there was liquor discordancy, criteria for TTTS were not present. In the case of antepartum stillbirth (case 10), the IUD occurred in association with a hypercoiled cord and a fetal cardiac anomaly. In the antepartum stillbirth (case 9) the IUD in this DC pregnancy was at 33 weeks and was associated with hypercoiled cord. Excluding congenital anomalies, there were nine perinatal deaths giving a rate of 30 per thousand.

5 Year Table: TWINS	2017	2018	2019	2020	2021
Number of Cases	188	150	125	134	149
Twin Babies	371	300	246	266	298
Incidence per '00 deliveries	2.2	1.9	1.6	1.9	1.9
Perinatal Deaths	9	8	7	5	11
Perinatal rate per '000 twin babies	24.3	26.7	28.5	18.8	36.9
Caesarean Section	123	119	80	100	100
Caesarean Section Rate	65%	79%	64%	75%	67%

Perineal Clinic

The Perineal Clinic is a long established specialist clinic in the NMH providing a valuable service to patients and clinicians. Its remit is the assessment of women with pelvic floor injury post-delivery and in particular, the assessment of women who have had an anal sphincter tear [OASIS]. It is run by Dr Myra Fitzpatrick and Linda Kelly Advanced Midwife Practitioner (AMP). It is a weekly clinic and once a month, a complex perineal clinic is held in St Michaels Hospital, along with Ms Ann Hanly, Consultant Colorectal Surgeon and Dr Gerry Agnew, Consultant Urogynaecologist. Dr Conor O'Brien provides an extremely valuable service to us in assessing patients with suspected pudendal neuropathy and his neurophysiology assessments provide clarity in terms of management options.

Patients undergo a comprehensive assessment of pelvic floor function with a focus on bowel control and anal sphincter function. All patients undergo endoanal ultrasound, which is the gold standard in terms of imaging for anal sphincter tears. We remain the primary tertiary referral centre for such assessment although there are plans to establish clinics with similar imaging facilities in other units around the country. Almost 40% of our referrals are external referrals from other maternity units. We are keen to share our knowledge with interested parties and have welcomed physiotherapists, nurses and doctors into the clinic over the past number of years to ensure that our experience can assist in the care and management of affected patients and promote increased education and awareness of pelvic floor injury postpartum.

In 2021 we were fortunate to have two Specialist Registrars with an interest in urogynaecology attend and work in the clinic – Dr Bobby O'Leary and Dr Breffini Anglim. We are extremely keen that this practice should continue. OASIS injury is not specifically covered by any field of Obstetrics and Gynaecology but its natural closest affiliate is urogynaecology and we have been keen to emphasise this to trainees coming through. We would hope that urogynaecology specialists of the future would consider establishing Perineal Clinics throughout the country and undertaking the care and follow up of women who have sustained OASIS.

In keeping with many units in the UK, we have recommenced seeing antenatal patients and advising regarding mode of delivery following OASIS. This topic can be a very emotive one for the patient and they find it very beneficial to be given objective advice regarding their risk of recurrence. We anticipate that this practice will see an increase in the numbers attending for 2022. Our DNA rate fell below 20% for the first time in a number of years and this is very heartening. We have a long waiting list and would like to feel we were offering a service to our full capacity.

The Perineal Clinic has a close working relationship with the Postnatal 'POPPY' Clinic. They will flag up complex patients who may need to be seen sooner than the usual 4-6-month appointment with us. The Physiotherapy Department continues to be our main source of assistance in terms of patient management, with patients having been seen and assessed prior to their attendance with us. The Perineal Clinic, the POPPY Clinic and the Physiotherapy Department are at the forefront of improving postnatal care for patients in the NMH.

	2016	2017	2018	2019	2020	2021
Appointments offered	433	440	391	375	310	300
Attendances	333	343	301	282	241	256
New referrals	236 (71%)	238 (69%)	213 (71%)	198 (70%)	175 (73%)	175 (68%)
Follow-ups	97 (29%)	105 (31%)	88 (29%)	84 (30%)	66 (27%)	81 (32%)
Did Not Attend	100 (23%)	97 (28%)	90 (23%)	93 (25%)	69 (22%)	44 (15%)

Placenta Accreta Spectrum

Placenta Accreta Spectrum (PAS) refers to a range of clinical conditions characterised by abnormal placental adherence to the uterine wall. The incidence of PAS has increased substantially from 0.8 per 1000 deliveries in the 1980s to 3 per 1000 deliveries in the past decade, largely attributed to a rising global caesarean section rate. The condition is associated with significant maternal morbidity.

The PAS multidisciplinary team (MDT) service was established in The National Maternity Hospital in June 2017. This service provides care to patients of NMH and Rotunda and also accepts external referrals nationwide. A major addition to the service has been our ability to insert aortic balloon occlusion devices under ultrasound guidance in collaboration with interventional radiology colleagues in the Mater and St Vincent's University Hospitals.

The MDT aims to allow for the optimisation of antenatal risk factors, the development of both elective and emergency delivery plans and the appropriate postnatal follow up.

On average 5 cases are discussed at each MDT (range 2-10). In 2021, 11 patients with PAS were delivered, this included 7 caesarean hysterectomies and 4 uterine conservation procedures. Of these, 60% (n = 7) were external referrals. Table 1 provides a summary of these 11 cases managed within the MDT in 2021. The median gestation at delivery was 34+1 weeks (29+1 – 36+6). The majority of patients had an elective delivery (N = 8, 72%). The median estimated blood loss (EBL) was 1400mls (500 – 6400mls). Over half of patients did not require a blood transfusion (N=6, 53%).

All patients received social work, perinatal mental health, physiotherapy and lactation support as well as information about the Placenta Accreta Ireland Support Group.

Table 1. Overview of PAS procedures

Case	Age	Parity	Place of Delivery	Elective/ Emergency	Gestation	PAS Ultrasound stage	Procedure +/- IR	Anesthesia	Estimated Blood loss (ml)
1	36	5	MMUH	Elective	34	PAS2	Caesarean hysterectomy + Aortic balloon	Regional/ GA	500
2	32	2	NMH	Elective	35	PAS1	Caesarean hysterectomy + Aortic balloon	Regional	1200
3	31	3	NMH	Elective	33+5	PAS3	Caesarean hysterectomy + Aortic balloon	Regional	1400
4	44	3	SVUH	Elective	36	PAS3	Caesarean section with myometrial resection	Regional/ GA	4600
5	42	1	NMH	Elective	36+6	PAS1	Caesarean section with myometrial resection	Regional	800
6	37	1	NMH	Emergency	29	PAS3	Caesarean hysterectomy	GA	6400
7	36	2	NMH	Elective	35+3	PAS2	Caesarean hysterectomy	Regional/ GA	2250
8	45	3	Rotunda	Elective	33+5	PAS1	Caesarean hysterectomy	GA	1200
9	31	1	MMUH	Elective	36+1	PAS1	Myometrial resection + Aortic balloon	GA	1300
10	30	1	NMH	Emergency	31+4	PAS1	Caesarean section	GA	3000
11	35	2	Rotunda	Elective	36	PAS2	Caesarean hysterectomy	Regional/ GA	4800

Caesarean Scar Pregnancy

Caesarean scar pregnancy (CSP) is a common precursor to severe PAS and both conditions exist as part of a common disease spectrum. The true incidence of CSP is unknown with reported rates in literature varying from 1:800 to 1:2656. Although relatively uncommon its incidence in increasing in line with increasing caesarean section rates.

In 2021, 2 women were diagnosed with a caesarean scar ectopic. One patient had a live caesarean scar ectopic. Both patients underwent surgical evacuation under ultrasound guidance with insertion of a foley balloon catheter. Both patients were discharged home day 1. One patient developed a haematoma in the site of the previous scar. Both patients are currently awaiting a 6 month MRI to assess the uterine cavity post-surgery. A third patient was diagnosed with a live caesarean scar ectopic and continued the pregnancy, and will be considered as part of the 2022 data.

Table 2: Caesarean Scar Pregnancy Overview

	Age	Parity	Risk factors	Gestation	Management	EBL ml	Outcome
1	30	1+0	1x LSCS	6+1	Surgical evacuation under ultrasound guidance	1100	Developed scar haematoma post-operatively Awaiting follow up MRI
2	31	2+1	2x LSCS 1x ERPC	9+0	ERPC US Guidance	1000	3 month post-op US appearance of small defect at site of scar Awaiting follow up MRI at 6 months

Postnatal Poppy Clinic

Caroline Brophy and The Poppy Clinic Team received the Prof Colm O'Herlihy Medal for best research presentation entitled Perineal Granulation Tissue – The POPPY Clinic Experience at The NMH research and innovation symposium (RISE).

The Poppy Clinic commenced as a postnatal maternal morbidity clinic in March 2013. It is run by Dr Laoise O'Brien and Advanced Midwife Practitioner (AMP), Caroline Brophy. It was initially established to deal with minor postnatal complications e.g. wound infections. It then expanded to include mothers who have had complicated deliveries at 6 weeks postnatal e.g. Preterm birth, HELLP Syndrome, PET, Caesarean section under general anaesthesia, postpartum haemorrhages. Notes are reviewed and a provisional plan is made for a next delivery.

All patients who have a third degree tear are seen at six weeks. This is to assess how these patients are and if there are any issues on history and examination then the routine referral to the Perineal Clinic is expedited.

Any patient who is readmitted in the postnatal period is also reviewed in the clinic. The Poppy Clinic allows women to discuss events surrounding their delivery and this often allays fears about a subsequent pregnancy. Many women value this opportunity as questions often arise when patients go home.

Patients are referred from the wards in conjunction with the postnatal ward rounds which take place on the wards twice weekly. GPs and PHNs can also refer patients as well as Non-Consultant Hospital Doctors (NCHDs) when they encounter a wound infection on call.

Attendances at the clinic continue to rise annually with a decrease in the 'Did Not Attend' rate this year to 11.6%. We now have a Registrar and an SHO at every clinic. Many of our patients are seen on more than one occasion and a few are seen 4-5 times in the postnatal period. 30 patients had a General Anaesthesia for revision of episiotomies/removal of granulation tissue. The Postnatal Clinic and ward rounds are run with advice and guidance from Dr Susan Knowles (Consultant Microbiologist).

Clinic Activity

	Attended	Did Not Attend	DNA rate
2013	122	30	19.7%
2014	425	106	20.0%
2015	411	96	18.9%
2016	505	107	17.5%
2017	544	171	23.4%
2018	621	148	19.2%
2019	667	125	15.8%
2020*	720	89	11.6%
2021	856	116	11.9%

A separate Postnatal Debriefing Clinic run by Labour and Birthing Unit Manager, Martina Cronin, is provided for women who have had a traumatic delivery and offers a relaxed environment and generous time allocation to facilitate open discussion and debriefing. Dr Michael Robson follows up anyone who has had a delivery complicated by Shoulder Dystocia.

Caroline Brophy became AMP in Postnatal Care in January 2021. She has her own clinics where she sees patients who have wound issues and ones who need debriefing. She facilitates team follow up of complicated patients and has a special review clinic for women who are away from home while their babies are in NICU. (External transfers).

Caroline takes pride in seeing women on the ward and has also been involved in research stemming from the POPPY Clinic. We have had some publications recently in the British Journal of Midwifery.

Preterm Birth Clinic

The Preterm Birth (PTB) Team is led by Consultant Obstetrician and Gynaecologist Dr Siobhan Corcoran with Specialist Midwife, Dr Larissa Luethe, PTB Clinical Fellows, Dr Niamh Keating and Dr Marguerite Cheung O'Brien, PTB Research Fellow Dr Anthony Rafferty and Consultant Obstetrician and Gynaecologists, Dr Donal O'Brien, Prof Donal Brennan.

Referral Criteria and Care Pathway

Women are referred for antenatal care in the PTB clinic if they have previously had a preterm birth (<34 weeks) or have risk factors for sPTB (Spontaneous Preterm Birth) such as two or more LLETZ procedures or a Cone Biopsy. Frequent consultations every 2-3 weeks, a dedicated specialist midwife, microbiological screening, cervical length surveillance and interventions such as vaginal progesterone and cervical cerclage where indicated are employed in this high risk group.

20 women also attended PTB clinic for pre-conceptual counselling in 2021.

Obstetric Outcomes

2021, 183 women that had their antenatal care the Preterm Birth Clinic delivered a liveborn infant >23+0 at The National Maternity Hospital. 181 of the 184 attendees were >24 wks estimated gestational age (EGA).

Outcomes	
Attendances	184
Nullip	*49/184 (26.6%)*
Multip	*135/184 (73.4%)*
Livebirths >23+0 wks EGA	183/184 (99.4%)
EGA at delivery of livebirths - range	*23+1 - 42+0 wks*
Mid-trimester losses 14 - 23+6 wks	1/184 (0.05%)

Outcomes for births >=24 wks. (n=183)	
CS rate	63/183 (34.8%)
Operative vaginal delivery	16/183 (8.7%)
Spontaneous vaginal delivery	104/183(56.8%)
Livebirths delivery <34 wks	7*/183 (3.8%) **Includes 2 births at 23 wks*
Livebirths delivery 34+1 - 36+6 wks	16/183 (8.7%)
Livebirths delivery 37+0 - 42/40 wks	160/183 (87.4%)

McDonald/Shirodkar Cerclage	11
Mid trimester losses in this group	0
Livebirths in this group	11
Range of GA of Livebirths in this group	23+1 - 40 wks
Women that delivered with Abdominal cerclage in situ	4
Arabin Pessary use	3
Range of GA at delivery for those with Arabin Pessary	34+3 - 37+1 wks *1/3 had PPROM < 34 weeks*

Shoulder Dystocia

Definition:
Shoulder dystocia is diagnosed at vaginal delivery when the anterior shoulder fails to deliver on the first attempt with routine axial traction. Included also are the deliveries that proceed to either internal manoeuvres or delivery of the posterior arm without an attempt at routine axial traction.

	Nullips	Multips	Total
No of Shoulder Dystocia Cases	**33**	**19**	**52**
Incidence	*33/1437 (2.3%)*	*19/2911 (0.7%)*	*52/4348 (1.2%)*
Spontaneous labour	14	15	29
Induction of labour	19	4	23
Spontaneous vaginal delivery	10	14	24
Operative vaginal delivery	23	5	28
Birthweight >4Kg	21	12	33

Single Cephalic Vaginal Deliveries Birthweight >4Kg	Nullips	Multips	Total
Spontaneous Vaginal	145	576	721
Operative Vaginal	104	47	151
C-Section	140	185	325
	389	808	1197
Incidence in Single Cephalic Vaginal Deliveries Birthweight >4Kg	21/249 (8.4%)	12/623 (2%)	33/872 (3.8%)

Procedures to Assist Delivery of Shoulders	Nullips*	Multips	Total*
McRoberts	6	5	11
McRoberts & Suprapubic Pressure	8	7	15
McRoberts & Suprapubic Pressure & Internal Rotation	3	0	3
McRoberts & Suprapubic Pressure & Delivery of Posterior Arm	9	3	12
McRoberts & Suprapubic Pressure & Internal Rotation & Delivery of Posterior Arm	4	3	7
McRoberts and Posterior Arm	2	0	2
Internal Manoeuvre Only	0	0	0
McRoberts & Internal Rotation	0	1	1
Total	**32**	**19**	**51**

Position of Head at Delivery	Nullips*	Multips	Total*
ROT	14	7	21
LOT	18	12	30
Total	**32**	**19**	**51**

Maternal Complications	Nullips*	Multips	Total*
PPH >500ml	9	6	15
Third or fourth degree tear	5	1	6

Neonate Complications	Nullips*	Multips	Total*
Low Apgars @ 5 mins	4	1	5
Encephalopathy	1	0	1
Brachial Plexus Injury	5	3	8
Fracture	2	2	4

- **1 case of incomplete documentation due to 1 MN-CMS Downtime*

Comment on Key Points:

- Shoulder dystocia is diagnosed at vaginal delivery when the anterior shoulder fails to deliver on the first attempt at routine axial traction. Included also are the deliveries that proceed to either internal manoeuvres or delivery of the posterior arm without an attempt at routine axial traction.
- The incidence of shoulder dystocia overall is 1.2% but there was a clear difference between nulliparous women (2.3%) and multiparous women (0.7%).
- The incidence of shoulder dystocia in babies delivered vaginally weighing over 4.0kg is 3.8% but again showing a clear difference between nulliparous women (8.4%) and multiparous women (2.0%).
- Brachial plexus injuries (BPI) are reported as any identified immediately after delivery. Reporting systems for the presence of BPIs at or after 6 months are not always easy to identify and therefore verify the continual presence of a BPI. However, the reporting of BPIs should be standardised as most of them disappear. Of the BPIs recorded in 2021 all apart from 1 had resolved by 6 months and one resolved by 12 months.

Termination of Pregnancy Service

The National Maternity Hospital was one of the first units nationally to provide termination of pregnancy (TOP) service after the introduction of the service in 2019. The hospital provides care under each of the four legal provisions for TOP care (<12 weeks, Maternal, Maternal Emergency and Fetal). Options for surgical and medical TOP care is given to all women <12 weeks and, gestation dependent, to those with maternal or fetal issues.

The majority of people attending for TOP care remain those less than 12 week's gestation (72%), followed by fetal indication (23%) and maternal (5%). *Please note these numbers are based on records that may be incomplete as a result of the national cyber-attack in 2021.*

Over half (57%, mostly <12 weeks) underwent a surgical TOP and the remainder (43%, including the majority of Section 9 and 10 indications) were medical. For both, extensive multidisciplinary input is required to provide safe, respectful, compassionate care to the women and their families. Teams involved include Obstetrics, Maternal Fetal Medicine, Midwifery, Nursing, Anaesthesiology, Bereavement, Chaplaincy and Perinatal Mental Health (Psychology and Psychiatry).

Clinical staff also actively participated in a research project with Trinity College Dublin, funded by the HSE, on women's experience within the TOP service at all levels of care; results from this project are currently being disseminated.

First Trimester Service

In 2021, most women had only one visit to clinic. Of these, four women chose to continue in their pregnancy following attendance in the clinic, often requiring many hours of discussion with clinic staff members. Four women attended who, on examination and ultrasound investigation, were over 12 week's gestation and unable to avail of a TOP under Section 12 of the Act.

Women under the age of legal consent are also seen by the medical social work team; mandatory referrals have been made to Tusla. Some women have also required the input of the Sexual Assault Unit, the Gardai (if allegations of assault, or need for forensic examination of products of conception) or the Genito-urinary medicine teams (if positive for sexually transmitted infections).

Women attending for first trimester TOP are given the option between medical (MTOP) and surgical (STOP) based on woman's preference and medical need. Over half of patients will complete the MTOP within six hours and the remainder require an overnight stay to complete. For STOP, most patients are discharged post procedure within six hours of admission.

Many attended for Anti-D following a medical TOP (MTOP) in the community, requiring midwifery, laboratory science and medical input.

Many (over half) attended the service following 'unsuccessful' community TOP – that is, that they had a persistent positive pregnancy test after the community TOP. Many these women had a positive pregnancy test due to retained products of conception and many underwent ERPC. A small minority had an ongoing pregnancy and attended the clinic for consideration of repeat TOP (usually surgical).

TOP for Maternal Medical conditions

Five women underwent TOP due to a maternal medical condition that met the criteria for the Act. Most were seen either in the clinic or initially the Maternal Medicine clinic, and all were seen by consultants in Maternal Fetal Medicine. Planning for TOP due to maternal medical conditions involves the input of multiple specialities to provide safe and respectful care. We continue to be grateful to our general medical and speciality colleagues in St Vincent's University College for their input into the care of this complex group. Occasionally we have to perform a TOP within SVUH campus to avail of the services there due to the indication for TOP.

TOP for Fetal Abnormalities

2021 was the third year since the Health (Regulation of Termination of Pregnancy) Act 2018 was passed into law and permitted access to abortion in Ireland. There were 30 patients seen at The National Maternity Hospital who met the criteria for FFA/LLC under Section 11 of the Act and underwent termination of pregnancy.

Ultrasound and Fetal Medicine

Prof Peter McParland, Director of Fetal Medicine.

The National Maternity Hospital provides a comprehensive early pregnancy assessment, ultrasound and fetal medicine service to over 8,000 women booked with the hospital. In addition, the hospital is a busy tertiary referral unit accepting referrals from health professionals from all over the country. The following services are provided: early pregnancy assessment, first trimester screening, detailed anomaly screening, monitoring of multiple pregnancy, assessment of fetal wellbeing, amniocentesis, chorionic villus sampling, management of rhesus disease, fetal therapy (including IUT, shunt placement and laser photocoagulation for twin-to-twin transfusion syndrome), antenatal care for high risk pregnancies. There are 9 dedicated Fetal Medicine sessions weekly.

The Fetal Medicine Unit workload remained extremely busy with a total of 35,111 (33,420 in 2020) official pregnancy ultrasound scans performed and recorded on the Viewpoint System in 2021. In total 27,653 ultrasounds were performed in the Fetal Medicine Unit and 7,458 in Merrion Fetal Health (MFH). This unit provides similar ultrasound services to fee paying patients and as such works with the same clinical guidelines and governance. MFH performed 21% of the total scans. The figures presented in this report are a combination of both units. Included in the above, are 1,728 gynaecology scans performed in the Fetal Medicine Unit which do not include gynaecology scans performed by Consultant Radiologists which are recorded on the Radiology system. There is a daily early pregnancy assessment

service. In addition to performing scans, other duties of our ultrasonographers include performance of CTGs, phlebotomy, preparation, attendance and assistance at invasive procedures, gynaecology scans, counselling, department audits, clinical guideline development, bereavement counselling and liaising with social work, GPs and other disciplines in addition to providing general antenatal care. All patients are offered an anatomy scan and 20-21 wks. A detailed information leaflet is given to patients outlining the limitations of ultrasound.

Prenatal Screening/Diagnosis

The demand for prenatal diagnosis and screening, and in particular non-invasive prenatal screening (NIPT/ Harmony) continued to increase with a total of 2159 NIPT screens performed in 2021. Table 1 and Figure 1 at the end of this chapter outline these trends over the last ten years. (See Table 1)

It is interesting to note that 50% (figure 2) of the hospital population were 35 years of age or more (compared with nearly 31% 10 years ago) and 10.8% of those were aged 40 or more. 35% of all nulliparous deliveries were aged 35 or older. The figure of 50% over 35 years of age contrasts with our two sister hospitals where the rate is 38%. There continues to be no formal local or national policy on which patients should be offered these tests. The adoption and implementation of a nationally agreed equitable prenatal screening/ diagnosis programme is needed urgently. The responsibility for funding and implementation for this lies with the HSE/NWHIP. See figure 2 at end of chapter

Non-Invasive Prenatal Testing (NIPT)

NIPT (Harmony) was introduced in June 2013 and the numbers of patients availing of this test has rapidly increased with this trend highly likely to continue as the test becomes more affordable. Currently this test is not state or hospital funded and is unlikely to be in the near future. There was a falloff in first trimester screening numbers reflecting the superiority of NIPT as a screening test. A total of 2,159 NIPTs were performed with 24 screen positive results (T21, 18; T18, 4; T13, 2; gender, 0). Figure 3 outlines the trends of numbers attending for NIPT and can be seen at the end of this chapter.

The number of prenatal diagnostic procedures carried out was 175, with 53 CVS's and 122 amniocentesis performed.

The majority of prenatal diagnostic testing was carried out when there was an ultrasound suspicion of an abnormality. Table 2 outlines the indications for amniocentesis/CVS over the past ten years and Table 3 outlines the various abnormalities detected by these procedures. In total 68 out of 175 (39%) of those undergoing diagnostic yielded abnormal results.

Table 4 outlines the ultrasound anomalies diagnosed using the RCOG/RCR classification for the last 10 years. There were a total of 343 abnormalities detected by ultrasound. In addition, there were 68 chromosomal anomalies diagnosed giving a total of 411 congenital abnormalities for the year. The majority of diagnoses within the hospital population are made by midwife sonographers/radiographers and are usually seen within 24 hrs by a fetal medicine consultant where appropriate. We continue to see an increase in the number of external referrals and if these are deemed urgent they can usually be seen within 24 – 48 hours. There is a daily high risk clinic which is staffed by a consultant in which these patients can be seen. Where appropriate genetic testing, surgical, neonatal and genetic counselling is arranged pre-delivery and the patient usually attends the fetal medicine unit for the remainder of the pregnancy.

The weekly perinatal meeting continues to be an excellent forum for multi-disciplinary discussion of these complex cases. These meetings are attended by obstetricians, maternal fetal medicine specialists, neonatologists, a geneticist, paediatric radiologists, pathologists and a microbiologist, midwifery and nursing staff, laboratory staff, social workers and medical students. We also provide a fetal cardiology clinic in conjunction with Professor Colin McMahon, Paediatric Cardiologist. In addition to these specialist clinics there is a twice weekly neonatal consultant-led clinic where couples with complex cases meet with the neonatologist and discuss the ongoing management and anticipated care following birth.

See Table 4: Abnormalities Detected based on RCOG/ RCR classification

Termination of Pregnancy from Fatal Fetal Abnormalities/Life Limiting Conditions (FFA/LLC)

2021 was the third year since the Health (Regulation of Termination of Pregnancy) Act 2018 was passed into law and permitted access to abortion in Ireland. There were 30 patients seen at the National Maternity Hospital who met the criteria for FFA/LLC under

This approach to a complex but relatively rare fetal problem is an excellent example of a joint collaborative management strategy that successfully optimises care for these patients.

Section 11 of the Act and underwent termination of pregnancy. The NMH terminations take place in a private room in the middle of a busy ward which is suboptimal and does not give appropriate privacy.

Many units, including our own, have conscientious objectors who need to be respected. There are issues nationally and locally including interpretation of some aspects of the Health Act, and a lack of perinatal/neonatal palliative care or appropriate resourcing for perinatal pathology and genetics. These issues require urgent attention by the HSE/NWHIP.

Whilst the absolute numbers are not large, the time and workload that each of these cases entails is considerable. There are often multiple visits involving screening, ultrasound diagnosis, discussion of diagnostic procedures, interpreting results, informing patient of results, neonatal input and consideration of options before further visits and their admission. Information is given in a clear balanced manner about their options and that they will be fully supported in whatever path they choose. Not all couples with FFA/LLC choose termination of pregnancy and these couples are followed up in the Fetal Medicine Unit with a care pathway outlined for the remainder of the pregnancy and delivery with appropriate psychological, bereavement and chaplaincy support. At all times we endeavour to keep general practitioners and referring clinicians informed. We are indebted to Barbara Cathcart and Heather Hughes, who largely coordinate all of the above in a very calm, sensitive and efficient manner. Dr Claire Flahavan, Perinatal Therapist, continues to offer a much needed and valuable support service for couples who find themselves in these very distressing situations with excellent patient feedback.

Fetal Cardiology Programme *(Dr Siobhan Corcoran)*

The Fetal Cardiology service is staffed by Professor Colin McMahon, Midwife Sonographer Ms Cecelia Mulcahy and in 2021 had Obstetric and Fetal Medicine input from Dr Siobhan Corcoran and Dr Clare O'Connor. The service is further supported by our Fetal Medicine Midwives and Neonatology colleagues. Once again, the range and complexity of the lesions diagnosed prenatally in 2021 speaks to the quality of screening for congenital cardiac disease nationally. These patients often require multiple antenatal consultations with Cardiology, Fetal Medicine, Clinical Genetics, Neonatology and Medical Social Work departments. Delivery planning is critical to ensuring optimal postnatal management for these babies.

In 2021, the Fetal Cardiology Service cared for 71 women. 28 (39%) of these were internal referrals from NMH and 43 (61%) were from peripheral units. The table below is reported in a "one patient, one diagnosis" fashion. Some of these pregnancies were also complicated by extra-cardiac anomalies.

See Table 5: Congenital Heart Disease and Fetal Arrhythmias diagnosed in 2021

Dublin Fetal Surgery Group

(Prof Fionnuala McAuliffe and Dr Stephen Carroll)

Since 2010, the fetal surgical teams at the National Maternity Hospital, Dublin, and the Rotunda Hospital Dublin have collaborated jointly for the management of all cases of twin-to-twin transfusion syndrome referred to either centre. This has resulted in a single team approach to all such cases, regardless of which of the two hospital locations at which such patients are seen. During 2021, a total of 17 cases of severe twin-to-twin transfusion syndrome were managed by the Dublin Fetal Surgery Group by means of fetoscopic laser ablation of placental vessels. Amongst these 17 pregnancies, 6 resulted in survival of both fetuses, and 9 resulted in survival of one fetus, overall 21/34 babies (62%) survived. By the end of 2021, the group had treated 262 fetuses with laser surgery for severe TTTS, with at least one survivor occurring in 79% of cases (207/262). These results are consistent with the results at the major international centres providing this advanced fetal therapy. This approach to a complex but relatively rare, fetal problem is an excellent example of a joint collaborative management strategy that successfully optimises care for these patients.

National Fetal Neurosurgery Programme.
(*Prof Fionnuala McAuliffe and Prof Peter McParland, Clare O'Connor*)

There are weekly fetal neurosurgical clinics with **Mr. Darach Crimmins, Mr John Caird** and the Neurosurgery specialist nurses from Children's University Hospital, Temple St. Cases are presented to a multidisciplinary team at our weekly perinatal meeting, with ultrasound and fetal MRI images presented and discussed. Following MDT the patients are seen and jointly counselled by the neurosurgery and fetal medicine teams. Women with pregnancies with fetal spina bifida are offered referral to Leuven Belgium to explore the option of fetal NTD repair, if clinical indications are present.

Mr Crimmins and Mr Caird request that all cases being referred to Leuven, Belgium for consideration for fetal spina bifida repair be referred to this clinic to facilitate the postnatal care.

Dr Gabrielle Colleran, Dr Niamh Adams and Dr Ian Robinson review the fetal MRI images and provide an excellent service.

In 2021 44 individual cases were seen and assessed at the clinic, though a number of other cases were discussed at the fetal neurosurgery multidisciplinary rounds, without the patient being seen in clinic.

Details of cases seen in the joint clinic with one diagnosis per patient are: eighteen fetal spina bifida (two underwent fetal repair in Leuven, Belgium), three occipital encephalocele, thirteen ventriculomegaly (9 severe, 3 moderate and 1 mild), three cases with absence of corpus callosum (one with small cerebellum, one with heterotopia and one with mild ventriculomegaly), two cases with arachnoid cyst, and one each of vermian hypoplasia, posterior fossa epidermoid cyst, cerebellar hypoplasia, holoprosencephaly and one case of a very large orbital teratoma.

This service is coordinated by Heather Hughes and Barbra Cathcart. The programme receives referrals from all over Ireland and is the only clinic of its kind in Ireland.

Haemolytic Disease of the Newborn

Intrauterine Transfusions (IUT)

Routine antenatal prophylaxis with Anti-D at 28 weeks was introduced in May 2015 and should further reduce the number of cases seen (see Pathology & Laboratory Medicine Chapter). There were 2 pregnancies that required 2 transfusions and both had good outcomes. **Table 6 below** outlines the numbers attending for IUT over the past ten years. This hospital has been generally recognised as the national referral centre for this disease for many years.

Education/Appointments
The Fetal Medicine Unit continues to play an active role in teaching with both UCD and RSCI undergraduates in attendance. NCHDs are encouraged to attend for basic training by observing initially, followed by hands on experience. The midwifery staff continue to play a major role in both the theoretical and hands on components of the MSc in Diagnostic Imaging (UCD). different countries.

We continue to be recognised for full sub-specialty training in Maternal Fetal Medicine by the RCOG making this the only centre in Ireland for full training. Dr Gillian Ryan completed her training and we welcomed Dr Fiona O'Toole who commenced her training. Both contributed significantly to both the clinical and research output of the unit. This year we also welcomed Dr Sam Doyle, Consultant Clinical and Biochemical Geneticist with a special interest in Perinatal Genomics to the Hospital.

The workload of the unit remains busy in both volume and complexity. I would like to acknowledge the stewardship and contribution to ongoing development by Valerie Spillane (CMM3) and to all the team who every day go above and beyond to provide a safe, high quality and compassionate service to women and families.

Table 1: Prenatal Screening (excluding triple tests) and invasive diagnostic procedures

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
First trimester screening	805	824	979	822	478	380	340	275	199	177
NIPT (Harmony)	-	74	268	526	783	1183	1519	1818	2127	2159
Amniocentesis	128	121	105	101	91	90	105	126	118	126
Chorionic Villus Sampling	72	89	57	44	56	58	64	49	49	53
Total	**1005**	**1108**	**1409**	**1493**	**1408**	**1711**	**2028**	**2268**	**2493**	**2515**

Figure 1: *Prenatal Screening (excluding triple tests) and invasive diagnostic procedures*

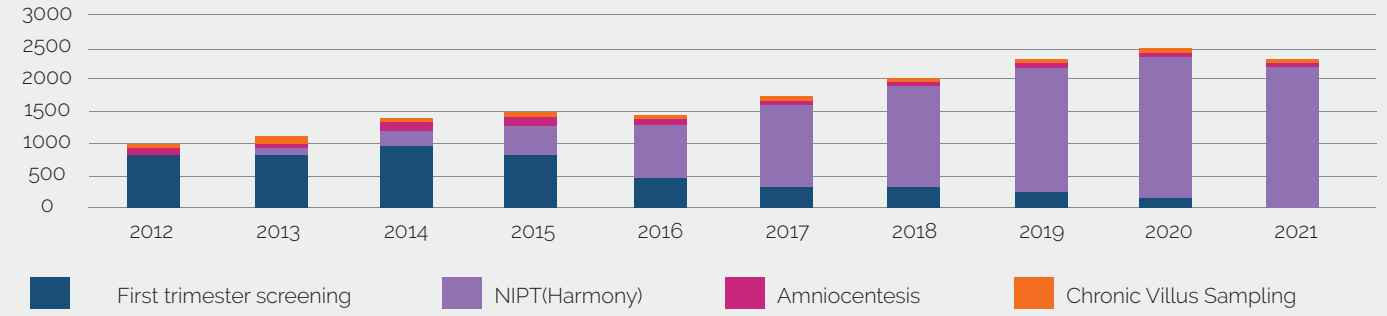


Figure 2: *Age Range of Mothers Delivered (*Aged >= 35 years includes those aged 40+)*

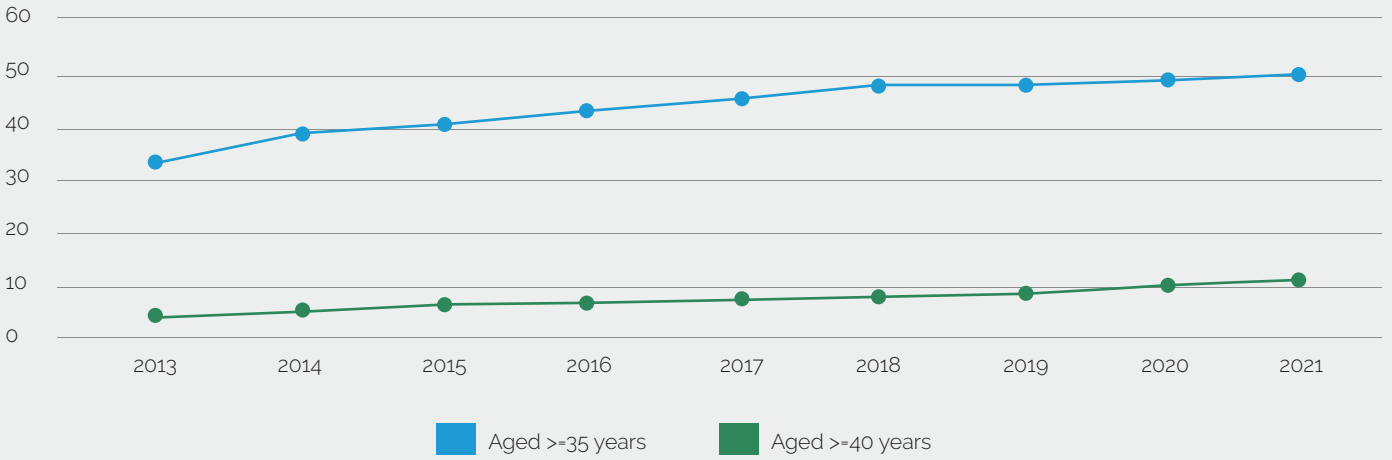


Figure 3: *Non-Invasive Prenatal Testing increasing since its introduction in 2013*

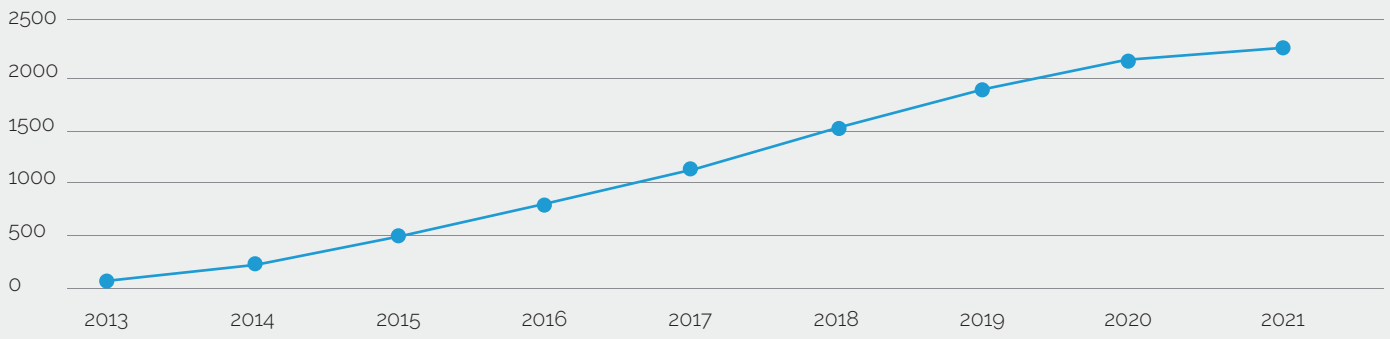


Table 2: Indication for Prenatal Diagnosis (Amniocentesis and CVS))

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Maternal age	14	10	2	3	3	0	1	2	0	0
Abnormal fetal ultrasound	97	82	87	83	74	79	103	113	106	108
Positive screening test	41	59	40	31	37	45	37	36	44	37
Previous chromosomal abnormality/carrier of translocation	20	22	10	11	16	10	6	9	3	13
Previous non-chromosomal genetic syndrome	19	23	18	12	13	12	9	8	8	7
Miscellaneous	9	14	5	5	4	2	13	7	6	10
Total	**200**	**210**	**162**	**145**	**147**	**148**	**169**	**175**	**167**	**175**

Table 3: Abnormalities Detected by Prenatal Testing

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Trisomy 21	22	26	31	23	28	33	28	39	39	31
Trisomy 18	15	13	13	18	17	18	15	23	22	16
Trisomy 13	9	8	9	4	5	1	8	8	9	8
Other aneuploidies	16	9	11	16	6	10	17	19	9	12
Non chromosomal genetic abnormality	6	8	5	3	8	3	2	0	4	1
Total	**68**	**61**	**69**	**64**	**64**	**65**	**70**	**89**	**83**	**68**

Table 4: Abnormalities Detected based on RCOG/RCR classification

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CNS (excluding choroids plexus cyst)	44	75	53	66	52	47	89	87	77	62
Head and Neck (including hygromata)	22	14	25	36	58	42	51	48	58	58
Cardiovascular system (excluding echogenic foci and untreated arrythmias)	82	75	65	94	78	73	50	62	82	79
Renal (excluding pelvic dilatation of <10mms)	23	60	47	45	36	46	34	45	35	46
Abdominal contents (including anterior abdominal wall defects and excluding echogenic bowel)	23	34	32	33	41	37	24	25	24	30
Skeletal	15	18	22	26	24	23	26	23	25	23
Thoracic (excluding cardiac abnormalities)	11	12	24	7	14	15	16	5	1	11
Others	40	37	24	27	40	42	49	40	42	34
Total	**260**	**325**	**327**	**334**	**343**	**325**	**339**	**335**	**354**	**343**

Table 5: Congenital Heart Disease and Fetal Arrhythmias diagnosed in 2021

Lesion	Number of cases	Referral from NMH	Referral from Peripheral Units	Antenatal diagnosis of genetic abnormality
Atrial Septal Defect	1	1	0	1
Atrial Ventricular Septal Defect	8	3	5	6
Cardiac Axis deviation	3	2	1	0
Cardiac Rhabdomyoma	1	1	0	0
Coarctation of the Aorta	1	1	0	0
Complex Heart Defect	3	1	2	2
Congenital Heart Block	4	3	1	0
Right atrial & IVC dilation	1	0	1	0
Double Outlet Right Ventricle	8	0	8	1
Heterotaxy	2	0	2	0
Hypoplastic Left Heart Syndrome	3	3	0	0
Hypoplastic Right Heart Syndrome	1	1	0	0
Hypertrophic Cardiomyopathy	1	0	1	0
Left SVC to Coronary Sinus connection	1	0	1	0
Left Ventricular Hypertrophy	1	0	1	0
Right ventricular Hypertrophy	2	2	0	1
Non-Offsetting of the AV Valves	5	1	4	1
Premature Atrial Contractions	4	1	3	0
Right Aortic arch	3	3	0	0
RV/LV disproportion	2	2	0	0
Situs Inversus Totalis	1	1	0	0
Supraventricular Tachycardia	1	1	0	0
Taussig Bing Anomaly	1	1	0	0
Tetralogy of Fallot	6	4	2	2
Transposition of the Great Arteries	3	3	0	0
Tricuspid atresia/dysplasia/regurgitation or stenosis	4	3	1	1
Truncus Arteriosus	1	0	1	0
Ventricular Septal Defect	17	9	8	7
Total	**89**	**47**	**42**	**22**

Table 6: Intrauterine Transfusions (IUT)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
No. of patients requiring IUTs	5	7	8	4	7	8	4	5	6	2
No. of IUTs	7	17	16	8	14	13	5	6	7	2

Colposcopy and Gynaecology Outpatient Clinics

Gynaecology Outpatient Department provide an extensive range of general and specialised gynaecology services in order to meet women's gynaecological health needs. These include urogynaecology, fertility, menopause, premature ovarian insufficiency, adolescent care, oncology, rapid access menorrhagia, perineal, colposcopy, transgender services, DES, hysteroscopy, recurrent miscarriage, termination of pregnancy, nurse-led pessary clinic, and general gynaecology care.

As the challenges of the COVID-19 pandemic remained throughout 2021, the clinics continued to run from 0800-1830 hrs with 3 sessions per day (a change made in 2020). This has proven an efficient way of delivering a service, maximising clinic numbers while facilitating social distancing for both patients and staff within infrastructural constraints.

A total of 11,622 patients attended the Outpatient Department in 2021. The number of virtual appointments increased by 53% from 2020 equating to 14% of all appointments, providing greater convenience for patients and enhancing operational efficiency. DNA rate for gynae outpatient attendances in 2021 was 10%, a reduction of 5% from the previous year. The expansion of gynaecology outpatient services in 2021 included the development of a complex menopause service.

This service, the first of four to be set up in Ireland is funded by National Women & Infants Health Programme and is led by Dr Deirdre Lundy, GP specialist in Women's Health. It is supported by GP menopause specialists and a dedicated Clinical Nurse Specialist in Menopause, Claire McElroy has recently been appointed to this role. The aim of this service is to enable patients with underlying serious medical conditions manage their menopausal symptoms.

Further expansion of women's health services within the gynaecology outpatient department for 2022 include the development of a dedicated gynaecology pain clinic with particular focus in providing care to patients as part of the National Mesh Complications Service. Dr Kirk Levins has been appointed as Consultant in Pain Medicine to this service.

The National Maternity Hospital is now designated as the new publicly funded fertility hub for the Ireland East Hospital Group. This expansion of fertility services commences January 2022, with Dr David Crosby, Consultant Obstetrician and Gynaecologist appointed as Consultant lead. Service support will include the appointment of a Fertility Nurse Specialist and Administrator.

The ability to fill vacant staff posts in a timely manner continues to be a challenge in delivering a gynaecology outpatient service. Acknowledgment must therefore be given to all staff involved in providing gynaecology outpatients services, including administration, nurses/midwives, doctors and allied health services. Their individual contributions have made it possible to continue to provide this essential service.

Colposcopy and Gynaecology Clinic Activity

	Attendances	DNAs	DNA Rate
Gynaecology	10152	1223	10.8%
Gynaecology Virtual	1470	63	4.1%
Total	11622	823	10.00%

Colposcopy

The continued Global COVID-19 pandemic in association with the cyberattack of May and June ensured that 2021 was another exceptional year for the colposcopy service at the NMH. The resumption of the CervicalCheck screening programme using the more sensitive HPV test resulted in an increase in new referrals to the service during the year. The cyberattack prompted a temporary adaption of the systems for new referral and result management away from computer based to a paper based system.

Despite these challenges, the service saw more new patients in 2021 than in any of the previous ten years. Considerable credit is again due to the team for the dedicated response to these events. Women were seen from 8am to 7pm with clinics running five days per week using a combination of nurse and consultant led clinics. Follow up appointments fell again this year as HPV testing in colposcopy continued to facilitate earlier discharge for surveillance to the community.

Women attended 6348 colposcopy appointments during the year – 2506 following a new referral and 3842 for a follow up visit. Most women were aged between 25 and 57 years with a mean age 36 years. Fifty women were aged less than 25 years and 410 were over 57 years. Of the 2506 new referrals, 2039 women were referred because of an abnormal screening test. In most cases, the cytology was abnormal but 123 women attended with repeated HPV positive test and normal cytology in line with the new screening programme guidelines for HPV testing.

"...the service saw more patients in 2021 than in any of the previous ten years. Considerable credit is again due to the team for the dedicated response to these events."

Of the new patients seen at colposcopy, 2039 Women were referred following an abnormal screening test and 467 were referred for clinical reasons. Improved triage in the gynaecology clinic led to a significant decline in the numbers of women with clinical symptoms being seen at colposcopy during the year. The percentage for the first quarter overall was 20% dropping to 8% by quarter four (see graph).

Prof Grainne Flannelly (right) with Margaret Ward, Colposcopy Administrator who retired from The NMH after many years of service.

This ensured increased capacity for referrals with an abnormal screening test.

Of the 2039 abnormal screening test referrals, 222 (11%) of those seen were referred with high grade cytological abnormalities (high-grade squamous intraepithelial lesions (HSIL)) or worse. The referral smear was low grade squamous intraepithelial lesions (LSIL) in 997 women (32%) and atypical squamous cells of undetermined significance (ASCUS) in 429 women (40%).

"A marked improvement was noted in the number of appointments that were unattended without prior notice (DNA or did not attend). This year the improved rate of 3.4% for the service was well within the recommended standard of <10%..."

Appointments were allocated according to the grade of cytological abnormality aiming to work within the timeframes suggested by the CervicalCheck quality standards. Despite the ongoing pressure on the service, efforts continued to meet the targets for the waiting times for new referrals. During the year, 197 out of the 222 (89%) of women with suspected high grade disease were offered appointments within the recommended four weeks after the receipt of the referral letter. For the 1,817women with suspected low grade disease, 74% (1338) were offered appointments within the recommended eight weeks.

A marked improvement was noted in the number of appointments that were unattended without prior notice (DNA or did not attend). This year the improved rate of 3.4% for the service was well within the recommended standard of <10% reflecting the value of contacting the women by telephone in advance of her appointment to confirm pre-assessment details regarding COVID-19 infection. The figure for new appointments was 1.6% compared to 4.4% for follow-up appointments.

A diagnostic punch biopsy was performed in 2,579 cases and 453 excisional procedures were performed. Excisional treatments included 654 Large Loop Excision of the Transformation Zone (LLETZ) procedures (all but two performed as an outpatient), 17 knife cone biopsies and five hysterectomies. In addition, 254 ablative procedures were performed in selected women using cold coagulation. The histology results are recorded in the table below; 1348 biopsies recorded a diagnosis of high grade abnormalities including 11 cancers and 26 cases of adenocarcinoma in situ. This represents an increase of 100% in the detection compared to 2020.

In 116 women, the LLETZ was performed at the first visit (select and treat) of which, no Cervical Intra-epithelial Neoplasia (CIN) was detected in 14 cases (12%); Three women were referred for clinical reasons with normal smears, six with ASCUS, one with ASC-H (ASCUS-suspected high grade), one with borderline glandular abnormalities and one with HSIL. A type three transformation zone was found in 10 (91%) of these women who had a mean age of 54 years ranging from 42 to 67 years. In older women, the presence of a type 3 Transformation Zone (TZ) limits the value of the colposcopic assessment and balancing the risk of overtreatment with the risk of missing occult high grade CIN or cancer in this group of women remains an ongoing challenge.

Treatment at the first visit should be avoided in women with suspected low grade abnormalities. Of the 765 women referred based on an abnormal screening test and low grade cytology, 55 underwent an excision at the first visit (3%) which was well within the target of <10%.

There was an improvement in 2021 in the waiting times for results of tests performed at colposcopy but delays in cytology results continued to represent a challenge. For histology, the median time for generation of a letter with the results was two weeks with compliance of the standard of within four weeks of 84% for women with a diagnostic punch biopsy and 71% for women with a LLETZ.

For women who underwent follow up smear and HPV tests at colposcopy the median time to generate the results letter was four weeks with compliance of the standard for generation of the results of the cytology and HPV results in four weeks in 57% of cases. Changes to the result management system during the year resulted in a marked improvement with overall compliance with the four-week standard achieving 91% in the fourth quarter of 2021. Clinical pathological CPC review meetings continued monthly with review of the cytology, colposcopy and histology findings and these continue as a valuable addition to our service.

The multidisciplinary colposcopy clinical governance committee met regularly and reviewed the quality of our service. The colposcopy information management system again provided most of the figures for this year's report and continues to be important in delivering improved communication of results and treatment plans. Structured training continued to be provided for trainees under the auspices of the British Society for Colposcopy and Cervical Pathology (BSCCP) which included web-based tutorials were held in preparation for the BSCCP Objective Structured Clinical Examination (OSCE) examination.

Outpatient Attendances

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
New attendances	2175	2443	2147	2154	2304	2317	2307	2294	1384	2506
Total attendances	10229	9867	8189	8938	8710	7994	7959	7467	5558	3842

Treatments

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
LLETZ	1059	849	875	858	921	795	709	691	443	654
Knife Cone	44	35	36	33	49	41	24	29	10	17
Ablation	5	5	5	28	232	253	271	294	142	264
Total	**1108**	**889**	**916**	**919**	**1202**	**1089**	**1081**	**1014**	**595**	**941**

Administrative Standards CervicalCheck

Administrative Standards CervicalCheck	NMH	Target
Proportion of women referred with high grade smear seen within four weeks	89%*	>90%
Proportion of women referred with a low-grade smear seen within eight weeks	74%*	>90%
Proportion of appointments which were unattended without notice	3.4%	<10%

Clinical Standards CervicalCheck	NMH	Target
Proportion of LLETZ as outpatients	99%	>80%
Proportion of women with CIN on histology of excisional specimens	89%	>85%
Percentage of women referred with low grade abnormality treated at the first visit	3%	<10%
Proportion of women treated at the first visit with CIN on histology	82%*	>90%
Proportion of women admitted as inpatient following treatment	1%	<2%
Proportion of results letters sent within 4 weeks of the clinic visit	72%*	>90%

Pathology Diagnoses*

Histology	Diagnostic biopsy	Excision
Adenocarcinoma in-situ	12	14
Cervicitis	34	3
CIN uncertain grade	42	6
CIN1	965	159
CIN2	536	165
CIN3	348	248
Inadequate	75	0
Invasive cancer	5	6
Normal/Viral changes	504	73
Other	17	0
Polyp	21	0
Vaginal Intraepithelial Neoplasia (VAIN1)	9	1
VAIN2	19	0
VAIN3	3	2
VIN1	7	0
VIN2	8	0
VIN3	12	0
Total	**2579**	**667**

**Number of biopsies performed and number of biopsies analyzed by pathology are not the same in any given time. As in previous years, the most severe abnormality is used for coding - a minority of cases have both squamous and glandular lesions present.*

Gynaecology Oncology

The gynaecological oncology service continued to develop during another busy year. The service is based between St Vincent's University Hospital (SVUH) and The National Maternity Hospital (NMH) and is part of the UCD Gynaecological Oncology Group (UCD-GOG). This group incorporating UCD, the Mater Misericordiae University Hospital (MMUH) and St Vincent's University Hospital is the largest Gynaecological Oncology Group in the country serving over two million people.

Our New Cancer numbers increased from 167 in 2020 to 175 this year. This represents a 29% increase since 2019 [n=135]. This increase is reassuring considering the effect of the COVID-19 pandemic had on the health service and society as a whole. Thankfully we were able to continue running clinics and theatre lists throughout the year. Our elective cancer surgery admissions to SVUH were transferred to beds in St Vincent's Private Hospital (SVPH) post-operatively. This was essential and without access to the private hospital beds we would not have been able to deliver care for these additional women. It is a model of care that serves the campus and the patients very well.

Our two specialist nurses are Sarah Belton and Louise Comerford. Louise delivers the new cancer survivorship service and provided 200 appointments in 2021. Sarah undertook an advanced nursing practitioner course and will complete it in 2022, with a view to initiating a BRCA risk reducing clinic in 2022. Together Louise and Sarah are an invaluable resource to our patients and together with colleagues in the Mater are expanding the cancer program.

Treatment Services

Almost all major surgery is now carried out at SVUH and diagnostic surgeries are carried out at NMH. Radiotherapy is provided mainly at St Luke's Hospital as well as SVUH. Medical oncology services are provided at SVUH. A limited number of patients who are suitable for peritonectomy and HIPEC (heated intraperitoneal chemotherapy) are treated in the Mater Hospital.
The UCD-GOG group delivers the largest publically funded robotic surgery program in Ireland. Our surgical numbers have been reduced because of rolling closures.

Multidisciplinary Structure

Every woman with a new diagnosis of gynaecological cancer was discussed at a MDT meeting in 2021. There were 25 MDT meetings in 2021 at which 513 women were discussed. The comparable number was 254 in 2018. A 101% increase in the 3 years.

Results

- 2021 was a busy year for the service with 175 new cases of gynaecological cancer diagnosed. The anatomical site of the cancers was broken down as follows:
- Endometrial cancer remains our most common cancer. 69 patients were treated during the year. The vast majority by minimally invasive surgery. The DaVinci robot system and the expertise of Mr Ruaidhri McVey has really helped treat the patients with higher BMIs.
- Unfortunately, ovarian cancer continues to be the biggest challenge for the unit. The numbers continue to rise with 58 people diagnosed this year. These patients need a multi-disciplinary approach and we get great support from Dr Fennelly and the medical oncology team in SVUH. A limited number of patients who are suitable for peritonectomy and HIPEC (heated intraperitoneal chemotherapy) are treated in the Mater Hospital.
- Cervical cancer was diagnosed in 28 women. This is a slight increase from last year.
- 15 borderline tumours of the ovary were treated during the year; this is a decrease from 21 in 2020. All were treated with surgery and thankfully have an excellent prognosis.
- 4 cases of new primary malignant vulval cancer were diagnosed in 2021.

2021	
Endometrium Cancer	69
Ovarian Cancer	59
Cervical Cancer	28
Borderline Cancer	15
Vulva Cancer	4
Combined Cancer	0
Total Confirmed Cases	**175**
Not Confirmed	15
Benign	30
Recurrences	12
Non-Gynae	9
Synchronous	1

Ambulatory Gynaecology

The Ambulatory Gynaecology service (outpatient hysteroscopy - OPH) continued to expand and develop in 2021. The service continued uninterrupted through the COVID-19 pandemic. Over 1,000 women were referred through the ambulatory gynaecology pathway, representing an almost 40% increase from 2020.

Over half of referrals were for investigation of postmenopausal bleeding. The majority of referrals were from General Practitioners.

There was an increase of 27% in the total number of hysteroscopy procedures performed in 2021. Notably, there was a 50% increase in the number of operative hysteroscopy procedures performed. These procedures included hysteroscopic resection of endometrial polyps and small fibroids as well as retrieval of intrauterine devices. Just over 9% of women required a procedure under general anaesthetic following an ambulatory gynaecology procedure/ appointment.

Our service is supported by the Gynaecology Oncology service at St Vincent's University Hospital (SVUH). 16 women were diagnosed with endometrial cancer and referred on for treatment.

With funding received from The National Women & Infants programme (NWHIP) we appointed our first Advanced Nurse Practitioner (ANP) candidate in Ambulatory Gynaecology. Our aim is to run nurse-led diagnostic hysteroscopy clinics in the future which will greatly enhance the service. The clinic was supported by additional administrative staff in 2021.

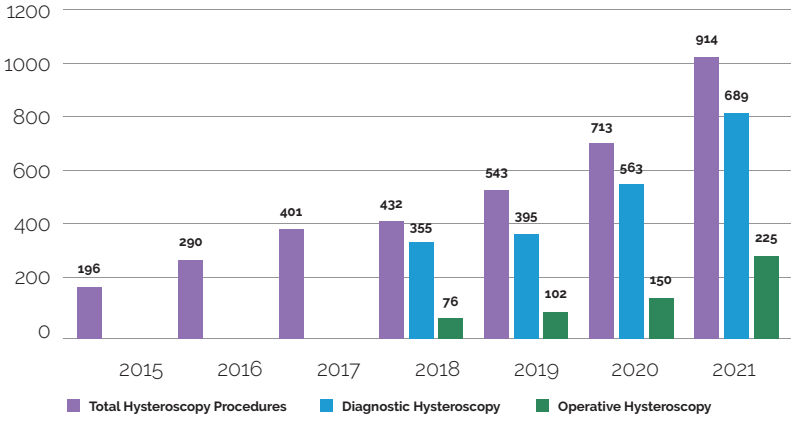
Funding from NWHIP has also been used to purchase new equipment for outpatient hysteroscopy. We hope to establish an additional clinic in 2022 in order to create additional capacity.

	2018	2019	2020	2021
Total no of referrals to ambulatory gynae	518	471	582	718
Total no of patients attending hysteroscopy clinic	471	582	718	1007
Total outpatient hysteroscopy procedures	431	497	713	563
Diagnostic hysteroscopy	355	395	563	689
Operative hysteroscopy	76	*102*	*150*	*225*
Cases requiring general anaesthetic	13.5%	6.7%	4.5%	9.5%

Types of procedure performed

	Hysteroscopy +/- IUD insertion	Truclear / Myosure polypectomy	Betocci Hysteroscopic removal IUD	Total
2021	689	176	49	914
2020	563	112	38	714
2019	395	61	39	543

Outpatient Hysteroscopy Trends



Trophoblastic Disease

Linda Kelly, Advanced Nurse Practitioner, Urogynaeology, Niamh Murray, Advanced Nurse Practitioner, Ambulatory Gynae, Claire McElroy, formerly of the Trophoblast Clinic and now, Clinical Nurse Manager 2, Complex Menopause Service.

The clinic was led by Claire McElroy, Clinical Midwifery Manager 1, who moved to her new role in the Menopause Clinic at the end of the year, and Dr David Fennelly. 41 new patients were diagnosed and treated during the year. 3 patients needed repeat ERPC's and 2 patients were referred to SVUH for chemotherapy. The number of women requiring chemotherapy remains very low by national and international standards. The National Cancer Control Programme trophoblastic centre is very keen to centralise all the patients in the country. This has some advantages but also will lead to a less streamlined service for our patients. It is something that may happen in 2022.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Number	551	31	20	17	35	30	28	20	29	41	802
Chemotherapy	66	3	2	2	1	1	1	1	1	1	78

Cases for 2012 include cases from 1980

Paediatric and Adolescent Gynaecology

Paediatric and Adolescent Gynaecology (PAG) services provide specialist care to children and adolescents aged 0-18 years.

The PAG service at NMH is led by Dr Orla Sheil and Dr Venita Broderick. Two clinics are held per week where we see girls aged 12+. Children and adolescents and their families travel from all over Ireland to access these specialist services. In 2021 there was a 58% increase in the number of PAG referrals to our clinics.

80% of referrals are from general practitioners. Approximately 10% of referrals come from Children's Health Ireland, (CHI) Crumlin. The remainder come from other hospitals around the country. We are supported by our gynaecology clinic nurses. We have a dedicated adolescent nutrition and dietetics service which runs concurrently with our clinics. We have access to imaging both in NMH and at SVUH. Younger patients have imaging at CHI Crumlin.

The majority of referrals are for adolescent menstrual problems. Other common reasons for referral include pelvic pain and ovarian cysts. We also see girls with rare conditions such as congenital anomalies of the reproductive tract and premature ovarian insufficiency.

A small number of adolescents with complex congenital conditions requiring reconstructive surgery are referred to University College Hospital, London under the HSE Treatment Abroad Scheme.We work closely with paediatric colleagues at CHI Crumlin. We form part of a national multidisciplinary team managing children born with complex congenital anomalies such as the Disorders of Sexual Differentiation. This group meets at CHI a number of times per year.

Our clinics also provide continuity of specialist care for adult women diagnosed with complex congenital conditions in childhood and in adolescence. We also see young women up to age 25 who present with a variety of gynaecological issues such as abnormal uterine bleeding, pelvic pain and symptoms suggestive of PCOS.

We contribute to undergraduate education programmes in both UCD and RCSI. Basic specialist trainees and higher specialist trainees attend our weekly clinics. We are regularly involved in GP education days, in-house educational sessions as well as interdisciplinary teaching at CHI.

In 2021 we continued to offer virtual appointments but mainly for follow up appointments. This is of particular benefit to patients and their families who would otherwise have to travel long distances to attend the clinic.

We plan to continue to develop our services in 2022. We will have a dedicated adolescent nurse at each clinic. Funding has been received from NWHIP which will help us to develop our service as well as contribute to the establishment of a PAG service at the new National Children's Hospital.

Patients aged <18 yrs:

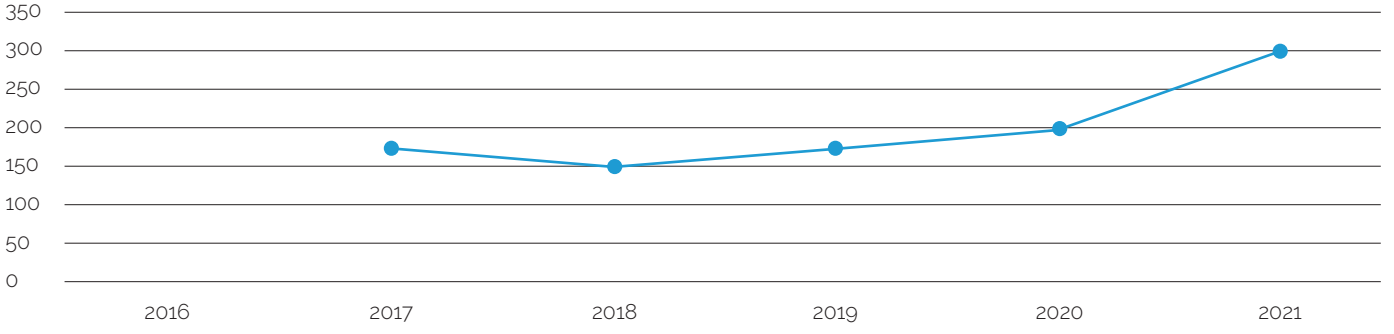
Clinic attendances	New Patients	Return Patients	Virtual Appointments new and return	Total
2021	171	89	95	**309**

Total Clinic Numbers:

Clinic attendances	New Patients	Return Patients	Virtual Appointments new and return	Total
2020	374	173	137	**823**
2021	427	316	236	**979**

Did not attend rate: 10%

No. of attendences aged <18 yrs:



Reproductive Medicine

Due to the ongoing COVID-19 pandemic, 2021 continued to present a number of challenges, particularly during lockdown in the first quarter. Nevertheless, reproductive medicine services, including assisted reproduction services, were facilitated and provided by specialists at the National Maternity Hospital (NMH), Merrion Fertility Clinic (MFC), St. Michael's Hospital (SMH) and our satellite clinic in Galway.

A. ESHRE Accreditation

In 2021, MFC/NMH received accreditation by the European Society for Human Reproduction and Embryology (ESHRE) as an ESHRE/EBCOG (European Board and College of Obstetrics and Gynaecology) - affiliated subspecialist training centre in Reproductive Medicine and Surgery. This important recognition of our subspecialty training program will formalise training at a senior level in Reproductive Medicine and will make trainees eligible to become European Fellows of Reproductive Medicine (EFRM). The inspection team were extremely impressed with our facilities and training program and awarded us accreditation for 5 years, rather than the standard 2 years they generally award for first inspections. This accreditation is a testament to the dedicated and experienced staff at MFC and the NMH.

B. Increased activity Merrion Fertility Clinic

Referrals and treatments at Merrion Fertility Clinic increased significantly in 2021 compared to the previous 2 years. This is likely related to the clinic's increasing public profile and reputation and a planned expansion of services. However, it is also likely to be related to the covid pandemic which may have led to an increased focus generally on fertility and the importance of family. Difficulty travelling abroad for treatment may also have contributed. Activity in 2020 was curtailed by the clinic's closure for over 2 months in 2020 due to the Covid pandemic.

Compared to 2020, referrals in 2021 increased by 42%, total oocyte retrievals increased by 57%, oocyte vitrification cycles increased by 143%, IVF/ICSI cycles increased by 47.5%, Frozen embryo transfer cycles increased by 59% and IUI cycles increased by 300%.

C. COVID-19, Telehealth and patient e-learning digital platform

As a result of the continuing global COVID-19 pandemic, mitigation strategies including video patient consultations, telemedicine, restricted access for partners and enhanced infection control measures remained in place. This enabled a full continuation of services. Telehealth was expanded to include a secure online e-consent platform for ART related procedures.

D. The Childhood Cancer Fertility Project (MFC and Irish Cancer Society)

The Childhood Cancer Fertility Project was launched jointly with the Irish Cancer Society in August 2020, MFC having been successful in securing grant funding from the Irish Cancer Society for a three-year project (2020-2023) to develop and provide fertility preservation for children, adolescents and young adults. A sperm and egg freezing service for post-pubertal adolescents about to undergo gonadotoxic treatment is now well established and a post-treatment assessment and treatment clinic has been established for survivors aged up to 24. In September 2021, a team from MFC visited the John Radcliffe Hospital in Oxford, which has a world renowned ovarian and testicular tissue cryopreservation service for pre-pubertal children. Collaboration and expert advice from our colleagues in Oxford will help MFC to establish a similar service in Ireland.

E. Merrion Fertility Foundation (MFF)

A very generous donation was received to our sister charity, the Merrion Fertility Foundation. This will enable us to provide assistance to many more patients in the coming years.

Clinical Activity

Clinic appointments

Dedicated hospital clinics for reproductive medicine, encompassing infertility, endometriosis, PCOS etc continued throughout 2021 with 304 first visits, 131 return appointments, 183 telephone/telemed consultations. Our recurrent and multiple miscarriage clinics saw 40 women/couples and did 44 new telephone/telemed consultations.

The mean age of women undergoing fresh IVF/ICSI cycles was 37.4 years. In 2021, 30.1% of all cycles started were in women aged 40 or more, an increase of 9% over 2019 and 2020. See Chart 1.

Elective single embryo transfer eSET: 65.7% of MFC patients had a single embryo transfer in 2021, reflecting the clinic's strong single embryo transfer policy. Of this group, a subset of good prognosis patients had an elective single embryo transfer (eSET), meaning they had a top or good quality embryo to transfer and at least one other to freeze. This group comprised 36.7%

of all embryo transfers and, across all age groups, had a clinical pregnancy rate per embryo transfer of 46.2% on the fresh cycle. Of those eSET patients who did not conceive on their fresh cycle, 52.5% conceived on their first frozen embryo transfer (FET), bringing the cumulative pregnancy rate in this group to 84.6% (following one fresh transfer and a FET if the fresh was unsuccessful). Many of these patients have additional embryos still in storage.

Multiple pregnancy: The multiple pregnancy rate following a fresh embryo transfer was 2.6%, a rate which is very low by international standards. All of these multiple pregnancies were twins and the majority (92.3%) occurred following double embryo transfer (6.25% multiples vs 0.3% in SET group).

Livebirth rates are the best marker of ART success and are reported for 2020 as, at the time of writing, not all 2021 pregnancies are complete. The livebirth rates per embryo transfer for fresh IVF and ICSI cycles performed in 2020 (delivering in 2020/2021) are excellent by international norms (Table 4, Chart 2). Approximately one third of all couples completing IVF/ICSI cycles had a livebirth.

Frozen embryo transfer (FET) cycles: In 2021, the clinical pregnancy rate per embryo transfer for frozen embryo transfer cycles increased significantly. This may be due to changes in luteal phase support with greater use of subcutaneous progesterone, particularly in those with a history of prior biochemical pregnancy. See Chart 3, Table 5.

Intrauterine Insemination (IUI): In 2021, the overall clinical pregnancy rate per intrauterine insemination was 13%. This figure includes IUI using donor-derived sperm (see below). The clinical pregnancy rate for IUI where a partner's sperm was used was 7.6%, with 92 inseminations completed and 7 clinical pregnancies recorded in 2021.

Donor Sperm treatments: Merrion Fertility Clinic commenced a donor sperm service in 2018. Sperm is sourced from two approved donor banks in Denmark. This is an essential treatment for single women, same sex couples and heterosexual couples with severe male factor infertility, not suitable for ICSI ± Surgical Sperm Retrieval. This is a growing and successful service. See Tables 6 and 7.

Child, Adolescent and Young Adult (CAYA) Fertility Preservation Services

AYA Males: Twelve adolescent males between the ages of 12 and 17 years were referred to MFC in 2021 for sperm cryopreservation services before undergoing gonadotoxic treatment or surgery for cancer (11 patients) or autoimmune disease (1 patient). Diagnoses included: melanoma, testicular tumour, T-cell acute lymphoblastic leukaemia (ALL), Hodgkin's lymphoma, Burkitt's lymphoma, osteosarcoma, acute myeloid leukaemia (AML) and rhabdomyosarcoma. Of these 12 boys, 11 produced a semen sample and all 11 had sperm of suitable quality for freezing.

AYA Females: Three adolescent females (aged 15 to 17 years) were referred to MFC in 2021 for oocyte vitrification before undergoing gonadotoxic cancer therapy. Oncology diagnoses were oligodendroglioma and Hodgkin's Lymphoma. All of these young women had a successful cycle, with a mean of 7 oocytes cryopreserved for future use.

Six female survivors of CAYA cancer, who had previously received gonadotoxic treatment as part of their cancer therapy, attended MFC in 2021 for an initial fertility consultation. Thirteen female survivors attended for a follow-up fertility consultation and ovarian reserve testing.

Research

The Reproductive Medicine department maintains an active and productive research portfolio, collaborating with scientists in Irish academic institutions such as UCD and TCD. MFC employs a full-time Research Officer and two Clinical Research Fellow posts exist for higher training in Reproductive Medicine & Surgery, with both fellows undertaking higher degrees. An additional Aspire Fellowship post was filled in 2021. MFC also hosts PhD and MSc students.

Research at MFC is aimed at improving knowledge, expertise and care pathways in the field of reproductive medicine. Our studies span a range of topics, from basic mechanistic biology to clinical translational research. In 2021, researchers at MFC also worked closely with collaborators at several of Ireland's leading academic research institutions, including University College Dublin and Trinity College Dublin, on the following research projects:

- Innate immune factors, endometrial receptivity and infertility (Funding: Grant for Fertility Innovation, Merck)
- Endometrial microbiome and infertility (Funding: Grant for Fertility Innovation, Merck)

- Glycome analysis in endometriosis (NIBRT collaboration. Funding: Horizon 2020, Marie Curie International Fellowship)
- Development of improved laboratory tests for sperm quality and function in male infertility (Funding: Irish Research Council)
- Knowledge and attitudes towards fertility preservation among patients and healthcare providers
- Ovarian reserve in childhood cancer survivors
- Impact of the COVID-19 pandemic, fertility service postponement and clinic risk mitigation strategies on fertility patients
- Attitudes of male fertility patients towards the novel COVID-19 vaccine

Publications are in the Published Research section.

Table 1: Reproductive surgery under General Anaesthetic

Reproductive surgery at NMH	2021
Hysteroscopy - operative and diagnostic	86
Operative laparoscopy	29
Diagnostic laparoscopy	39
Myomectomy	3
Total laparoscopic hysterectomy	4

Table 2: Assisted Reproduction, Merrion Fertility Clinic

Year	Semen analyses	Surgical Sperm Retrievals	Ovulation induction and IUI (completed)	IVF/ICSI (Completed to oocyte retrieval)	Frozen embryo transfer cycles (Completed to embryo transfer)	Oocyte vitrification Completed to oocyte retrieval)
2017	1398	8	157	454	263	3
2018	1459	2	151	407	301	40
2019	1412	6	161	399	334	49
2020	1172	9	152	413	236	46
2021	1426	10	226	609	376	112

Conscious sedation was provided by Consultant Anaesthetists for all oocyte retrievals and surgical sperm retrievals.

Table 3: Activity and Clinical pregnancy rates (%) for IVF and ICSI cycles

2021	All Ages	Under 35	35-37	38-39	40-41	42-44
Cycles Started (n)	687	141	166	173	135	72
Oocyte Collections	609	126	151	153	120	59
Embryo Transfer	498	96	126	127	101	48
Average Eggs Collected	7.89	9.83	7.92	7.59	6.55	7.22
Clinical Pregnancies	179	36	51	47	30	15
CPR per Cycle Started	26.1	25.5	30.7	27.2	22.2	20.8
CPR per Oocyte Collection	29.4	28.6	33.8	30.7	25	25.4
CPR per ET	35.9	37.5	40.5	37	29.7	31.3

Clinical pregnancy rates as per ESHRE (European Society for Human Reproduction and Embryology) i.e. fetal heart, fetal pole or a clear pregnancy sac are seen on ultrasound at 6 to 8 weeks gestation. Biochemical pregnancies (positive pregnancy test only) are not included but ectopic pregnancies and miscarriages are.

Table 4: Live Birth Rate fresh IVF/ICSI 2020

	All Ages	Under 35	35-37	38-39	40-41	42-44
LBs	100	37	22	25	13	3
LBR per OCR	24.75%	32.46%	21.57%	27.78%	19.70%	9.38%
LBR per ET	31.55%	44.05%	26.51%	35.21%	23.64%	12.50%

Chart 1: 2020 Clinical Pregnancy Rates by Maternal Age

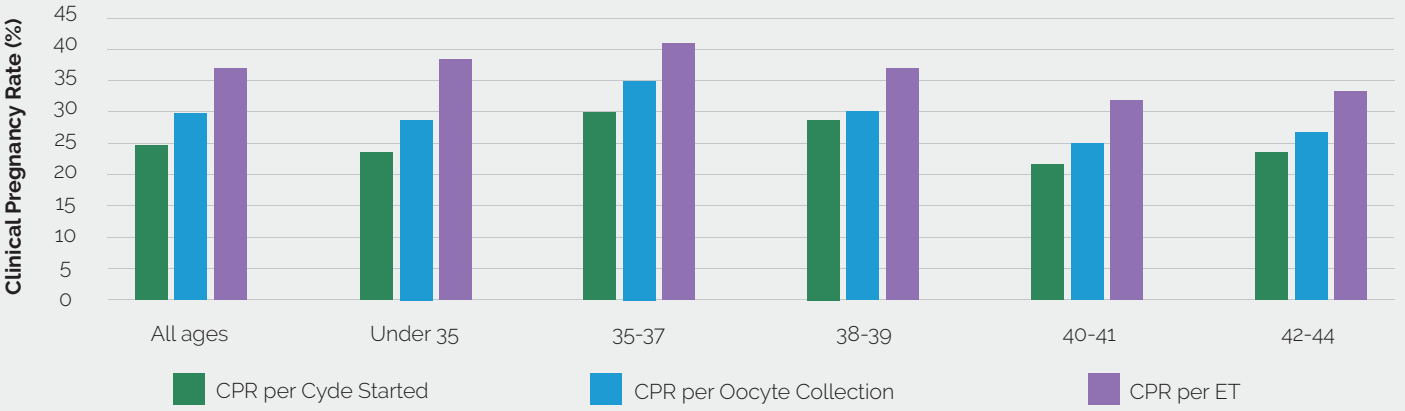


Chart 2: Live Birth Rate (2020) per Fresh Embryo Transfer by Maternal Age

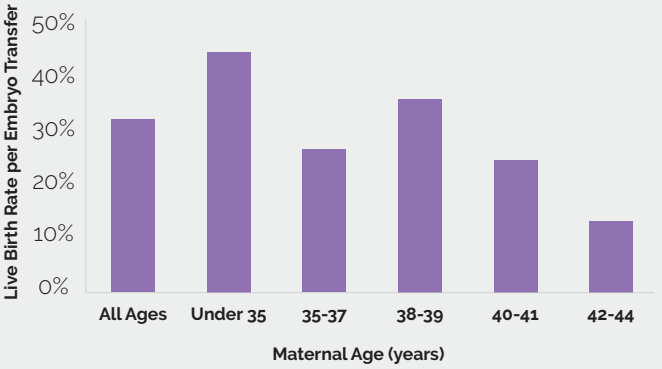
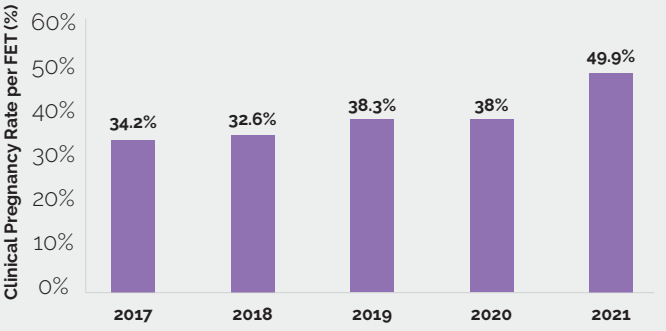


Chart 3: Five-year Clinical Pregnancy Rate (%) per Frozen Embryo Transfer (FET)



Frozen embryo transfer (FET) cycles: In 2021, the clinical pregnancy rate per embryo transfer for frozen embryo transfer cycles increased significantly. This may be due to changes in luteal phase support with greater use of subcutaneous progesterone, particularly in those with a history of prior biochemical pregnancy. See Chart 3, Table 5.

Table 5: Live Birth Rates Frozen Embryo Transfer 2020

2020	All Ages
Thaws	315
Embryo Transfer	313
Live Births	76
LBR per Thaw	24.10%
LBR per Embryo Transfer	24.28%

Table 6: Clinical Pregnancy Rates (%) for IUI cycles using Donor Sperm

2021	All Ages
Cycles started	48
Inseminations	36
Clinical Pregnancy	7
CPR per cycle started	14.6
CPR per insemination	19.4
Multiple rate	0

Table 7: Clinical pregnancy rates (%) for IVF and ICSI cycles using Donor Sperm

2021	All Ages	Under 35	35-37	38-39	40-41	42-44
Cycles Started	25	2	6	8	8	1
Oocyte Collections	21	2	5	6	7	1
Embryo Transfer	17	1	5	3	7	1
Clinical Pregnancies	6	0	2	0	4	0
Multiple Pregnancies	1	0	0	0	1	0
Average Eggs Collected	8.8	16	8.4	8.83	6.1	15
CPR per Cycle Started	24.0	0.0	33.3	0.0	50.0	0.0
CPR per Oocyte Collection	28.6		40.0	0.0	57.1	0.0
CPR per ET	35.3	0.0	40.0	0.0	57.1	0.0
Multiple Rate	6				14.3	

Theatre Procedures

Procedure	Total
Caesarean Section	2401
Evacuation of retained products of concepeption	426
Hysteroscopy	325
Dilatation and currettage	228
Manual removal of placenta	131
IUCD - Fitting of intrauterine contracepive device	102
Diagnostic laparoscopy	95
Examination under anaesthesia	73
Repair of Third Degree Tear	69
Cystoscopy	67
Posterior repair	56
Anterior repair	55
Laparoscopic treatment of ectopic pregna	48
Dye injection at laparoscopy	47
Injection of urethral bulking agent	45
Truclear polypectomy	43
Botox injection therapy	36
Endometrial ablation	32
Polypectomy	27
Vaginal hysterectomy	27
Bilateral tubal ligation	26
Repair of episiotomy	26
Total abdominal hysterectomy	25
Bilateral salpingo-oopherectomy	23
Laparotomy	21
Shirodkar's cervical cerclage	21
IUCD - change of intrauterine contraceptive device	21
Injection of nerve block	19
Marsupialization of bartholin's cyst/abs	19
Blood patch	18
ERPC postnatal	17
Perineal repair	17
Cone biopsy of cervix	16
Ovarian cystectomy- laparoscopy	15
Salpingectomy	14
Tubal ligation laparotomy	14
Colposcopy	13
IUCD - Removal of intrauterine contraceptive device	13
Total laparoscopic hysterectomy	13
Fenton's procedure	12
Removal of granulation tissue	12
Repair of second degree tear	12
Cervical smear	11
Cystectomy	11
Instrumental delivery	10
Laparoscopic bilateral salpingo oophorectomy	8
Laparoscopic hysterectomy	8

Procedure	Total
Resuturing of perineum	8
Tubal ligation-laparoscopy	8
Diagnostic hysteroscopy	7
Forceps delivery	7
Hysteroscopy D&C	7
Hysteroscopy D&C with mirena insertion	7
Incision & drainage of Bartholins abscess	7
Open myomectomy	7
Salpingo-oophorectomy	7
Trial of Instruments	7
Caesarean Section and tubal ligation	6
Operative laparoscopy	6
Repair of first degree tear	6
Vulval mapping	6
Dilation of cervix	5
ERPC - Molar	5
Hysterectomy	5
Insertion of Bakri Balloon	5
Pelvic floor repair	5
Removal of skin tag	5
Repair of fourth degree tear	5
Repair of labial tear	5
Caesarean hysterectomy	4
Colposuspension	4
Dilation and curettage of uterus	4
Endometriosis Laparoscopic	4
Excision of VIN- Vulval intraepithelial	4
Left salpingectomy	4
Myomectomy-laparotomy	4
Repair of vaginal tear	4
Vault prolapse repair-vaginal	4
Abdominal hysterectomy	3
Biopsy of cervix	3
Biopsy of Lesion	3
Cervical polypectomy	3
Diathermy of endometriosis	3
Endometrial Sampling	3
ERPC - Repeat	3
Evacuation of haematoma-vaginal	3
Excision of granuloma of vagina	3
Hysteroscopic myomectomy	3
Laparoscopic drainage of ovarian cyst	3
Laparoscopy with fulguration of lesion	3
LLETZ_surg	3
Omental biopsy	3
Omentectomy	3
Operative hysteroscopy	3
Revision of abdominal scar	3
Right salpingectomy	3
Trial forceps delivery	3

Procedure	Total
Unilat salpingo-oopherect-laparoscopy	3
Vaginal biopsy	3
Vulval biopsy	3
Adhesiolysis-laparos	2
Appendicectomy-laparotomy	2
Bilat salpingect-laparos not ectopic	2
Cystoscopy and Injection of Botox	2
Division of intrauterine adhesions	2
Drainage of Bartholin's abscess	2
Endometrial biopsy	2
Endometrial polypectomy	2
Excision of Bartholin's cyst	2
Excision of lesion	2
Exploration of C section wound	2
Hymenectomy	2
Incision and drainage of haematoma	2
Incision and drainage of labial cyst	2
Insert cervical cerclage/Shirodkar	2
Labial reduction	2
Labioplasty	2
Laparoscopic sterilisation	2
Laser procedure for twin to twin transfusion	2
Myomectomy-laparoscopy	2
Oophorectomy	2
Operative vaginal delivery	2
Removal of Cervical suture	2
Removal of ovarian cyst	2
Repair of vaginal laceration	2
Tubal clipping	2
Unilateral oopherectomy-laparoscopy	2
Unilateral oophorectomy	2
Urethral dilation	2
Vulval wide local excision	2
Evacuation of vulval haematoma	2
Ablation/diathermy endo-laparos	1
Amputation of cervix	1
Bilateral oopherectomy-laparosopic	1
Bilateral ovarian cystectomy-laparoscopy	1
Bilateral ovarian cystectomy-laparotomy	1
Classical Caesarean section	1
Cold knife cone biopsy of cervix	1
Coloscopy	1
Cystoscopy and bladder distension	1
Cystoscopy and Injection of Bulking Agent	1
Drainage of haematocolpos	1
Drainage of Ovarian Cyst	1
Evacuation of caesarean section wound haematoma	1
Evacuation wound abscess	1
Excision biopsy of vulval lesion	1
Excision of cyst	1
Excision of cyst of fallopian tube	1

Procedure	Total
Excision of septum of vagina	1
Excision of vaginal cyst	1
Excision of vaginal lesion	1
Excision of vaginal septum	1
Excision of VAIN	1
Excision of vulval cyst/abscess	1
Excision of vulval lesion	1
Exploration of uterus	1
Gynaecological laparoscopy	1
Hystero resect uterine adhesions	1
Hysteroscopy with endometrial ablation	1
Hysterotomy	1
Injection of perineum	1
Laparoscopic dye test of Fallopian tube	1
Laparoscopic uterosacral ligament suspen	1
Laparotomy post surgery	1
Laprotomy bowel resection	1
Mesh repair	1
Operative hysterosopy	1
Perineal Injection	1
Peritoneal washings	1
Posterior repair of vagina	1
Removal of mesh exposure	1
Removal of pessary from vagina	1
Repair of C section wound dehiscence	1
Repair of cervical laceration	1
Resection of endometrial	1
Revision of perineum	1
Suspension of vaginal vault	1
Suture of cervix	1
Suture of vagina	1
Total abdominal hysterectomy with bilate	1
Total laparoscopic hysterectomy	1
Transposition ovaries-laparoscopy	1
Unilat aspir ovarian cyst-laparoscopy	1
Unilat ovarian cystectomy-laparotomy	1
Unilateral salpingectomy	1
Unilateral salpingo-oophorectomy	1
Unilateral tubal ligation - laparatomy	1
Urinary incontinence/sling operation	1
Vaginal biopsy mapping	1
Vulvoscopy	1
	5127

These are procedures and not patients i.e. a patient may have had more than one procedure done in the overall surgery.

Urogynaecology

Yvonne Tallon and Baby Indie.

Due to the COVID-19 pandemic, many elective gynaecological clinics and surgical lists were curtailed during 2021. This particularly affected the Urogynaecology service where the conditions, though distressing for the patients, are generally benign. Therefore, our figures for clinics and surgical procedures were reduced for the year.

Despite this, the hospital continued to offer a tertiary led Urogynaecology service which saw expansion in both clinical and administrative personnel. Some of this expansion was due to our designation as one of the two Irish centres dealing with mesh complications. This year saw the appointment of two additional women's health physiotherapists as well as an administrator and a Consultant Pain Specialist, Dr Kirk Levins. The ongoing pause in mesh procedures now sees us offering women a choice of bulking agents, colposuspensions or pubo-fascial slings.

The establishment of the mesh complications service has involved the initiative of a multi-disciplinary team of experts to discuss and plan the management of complex cases. We have been very fortunate with the support and participation we have received from our Consultant Urology colleagues, Mr. James Forde from Beaumont and Ms Lisa Smyth from Tallaght Hospitals. In 2021, we also saw the launch of the Nurse run Pessary Clinic. This service facilitates patients attending for a routine change of a supportive vaginal pessary to be seen by the same Nurse Specialist at each visit.

This service retains rapid access for patients to expert advice when it is required while simultaneously improving access for new patients to Consultant-led clinics. This new clinic would not have been possible without the support of the Urodynamics Team, the Gynaecology Outpatient Managers and Administrative Staff. The Urodynamics team work alongside the Urogynaecology team to provide diagnostic tests (Uroflow, Urethral Pressure Profilometry and Cystometry) for women attending with urinary incontinence. The team also educate, support and follow-up women who present with urinary retention in the antenatal, postnatal and postoperative period.

This includes teaching bladder management techniques such as clean intermittent catheterisation, double voiding and on occasion management of long-term indwelling catheters. Multidisciplinary team working is important for women with continence issues and we work closely with our colleagues in the physiotherapy department and the pelvic floor centre in St Michaels Hospital, Dun Laoghaire.

Surgical Procedures	*2021*
Cystoscopy	67
Posterior repair	56
Anterior repair	55
Other perineal repair	17
Vaginal hysterectomy	27
Botox injection therapy	36
Injection of bulking agent	45
Vault prolapse repair – vagina	4
Colposuspension	4
Repair of 4th Degree Tear	5
Pelvic floor repair	5
Evacuation of haematoma - vaginal	3
Cystoscopy and injection of Botox	2
Labial reduction	4
Urethral dilation	2
Cystoscopy and bladder distension	1
Cystoscopy and injection of bulking agent	1
Excision of vaginal septum	1
Injection of perineum	1
Perineal injection	1
Posterior repair of vagina	1
Removal of mesh exposure	1
Removal of pessary from vagina	1
Revision of perineum	1
Revision of TVT/TOT/TVTO	1

Urodynamic Clinic Attendances			
	2019	2020	2021
Consultant Led			
New	382	540	733
Return	1200	870	817
Total Attendances	**1582**	**1410**	**1550**
DNA Rate	15%	19%	12%
Advanced Midwifery Practitioner (AMP) Led			
Total Attendances	**178**	**123**	**161**
DNA Rate	7%	6%	17%
Urodynamics Performed	147	91	143
Flow Studies	33	27	36
Self Catherisation	11	14	10
Bonano Catheters	2	1	0
Nurse Led Urogynaecology Referrals Source			
Consultant NMH	147	91	142
Consultant Elsewhere		0	0
Total Referrals	**147**	**91**	**143**
Nurse Led Urodynamics Diagnosis			
Normal Urodynamic Studies	28	9	27
Urodynamic Stress Incontinence	40	41	43
Mixed Incontinence	33	16	16
Hypersensitive Bladder	1	0	1
Overactive Bladder		38	23
Voiding Disorder	0	0	0
UTI No UDS – MSU Taken	4	1	0
Other	3	1	8
Total Diagnosis	**147**	**91**	**95**

Anal Sphincter Repairs			
	2019	2020	2021
Third degree tear	86	83	76
Fourth degree tear	3	3	5

Anaesthesia, Pain Medicine and High Dependency Care

Dr Siobhan McGuinness, Consultant Anaesthesiologist.

Staffing

Dr. Siaghal Mac Colgáin took over as Director of Anaesthesia from Dr. Larry Crowley in April 2021. The department employed two locum consultants Dr. Darshana Maheshwari and Dr. Naeem Ashraf. Dr. Kevin Mc Keating oversaw the chronic pain medicine service. There were 11 anaesthesia NCHDs in the department from January - July and 10 from July-December 2021.

Operating Theatre Activity

Despite the difficulties imposed by the ongoing COVID-19 pandemic, the Department of Anaesthesia continued its high level of activity in 2021. The total number of procedures performed in theatre was 4314 (an increase of 193 on 2020 however still below our pre-pandemic levels of approximately 4600 likely due to COVID-19 related curtailment of services).

Analgesia for Labour and Delivery

A wide range of multi-modal labor analgesic options were utilised by mothers including both non-pharmacologic (relaxation therapy, aromatherapy, TENS) and pharmacologic methods (nitrous oxide inhalation, intramuscular opioids and neuraxial techniques). Intravenous remifentanil PCA during labour was also available but there were no recorded users.

Post-Partum Anaesthesia Review

This service was established in 2021. We endeavor to review every post-natal patient that had an anaesthetic intervention.

Epidural Rate

MN-CMS recorded a total of 3,471 epidurals, however the number is likely circa 3,921 (+450) due to absent data following the cyber-attack. Subtracting the number of mothers who had a 'pre-labour' caesarean section from total delivered gives us the closest approximation of mothers who commenced actual labour and thus potentially had an opportunity to request epidural analgesia.

Almost all patients received low-dose Patient Controlled Epidural Analgesia (PCEA) using 0.125% L-bupivicaine and Fentanyl 2 mcg/ml with a 5 ml/hr background infusion, 5 ml patient bolus option with a lockout interval of 15 minutes. In certain circumstances, combined spinal epidural (CSE) or continuous spinal analgesia modalities were employed.
Mode of Delivery after Epidural Analgesia
Unfortunately, we have no information for this section due to an incomplete epidural data set as a result of the cyber-attack.

Unfortunately, due to the cyber-attack we are missing MN-CMS data on 301 caesarean sections as 2416 were recorded in the theatre records. Of these, 1203 (approximately 50%) were elective.

- Not all patients who had accidental dural puncture developed PDPH.
- Not all patients who had PDPH had recognised dural puncture.

• Not all patients with PDPH had epidural blood patch.

High Dependency Unit (HDU)

There were 116 instances of patients requiring overnight stay in HDU in 2021 (ranging from 8-13 admissions per month).

The most common reasons for HDU admission were:

Haemorrhage 52 (%)
Hypertensive disease of pregnancy 38 (%)
Sepsis 6 (%)
Other 15 (17%)
Some patients were admitted for more than one of the above reasons.

There were 6 patients transferred from HDU to St Vincent's University Hospital for further specialist care including 2 patients for critical care. One patient was transferred to NMH HDU from another hospital. These admissions are transfers directly from NMH HDU/ Theatre and do not include transfers from other areas of the hospital .eg. Antenatal Ward, Gynaecology Ward and the Emergency Department.

Outpatient Clinics

The Anaesthetic High Risk Clinic was held three to four times per month and a variety of patients were reviewed for obstetric and gynaecology pre-assessment. In 2021 a total of 95 new patients & 143 return patients were reviewed. Some patients are also reviewed at the weekly multidisciplinary high risk meeting and our newly established Pre-Assessment Clinic (PAC).

PAC

The newly established pre-assessment clinic endeavours to pre-assess all patients requiring an anaesthetic. We hope to have MN-CMS data for this in 2022.

Chronic Pain Medicine Clinic

The chronic pain medicine service continued to welcome multidisciplinary referrals from within house, from consultant obstetric, anaesthetic and pain medicine colleagues, physiotherapists, midwives and from primary care physicians in the community. 296 patients attended for first time evaluation and 115 return patients were reviewed. Invasive interventions in the form of local anaesthetic, local anaesthetic and steroid injection and radiofrequency neuromodulation were provided in the operating theatre for 19 patients.

Data collated from MN-CMS & Theatre database. Figures from MN-CMS are incomplete following the cyberattack.

Mode of Anaesthesia for C-Section on MN-CMS

		%
Spinal	1533	72%
Spinal/Epidural	75	4%
Epidural	459	22%
General	48	2%
Total	**2115**	

Post Dural Puncture Headaches (PDPH) and Epidural Blood Patch

Accidental dural puncture recorded	18
Epidural blood patch performed	18

Mode of Anaesthesia for C-Section on MN-CMS

	Total Delivered	Pre-labour C-Section	Epidural	Rate %
Nullip	3261	454	1939 (-2389)	69-85% (1939[-2389]/2807)
Multip	4431	1162	1532 (-1982)	47-61% (1532 [-1982]/3269)
Total	**7692**	**1616**	**3471 (-3921)**	**57-65% (3471 [-3921]/6076)**

The Maternal and Newborn Clinical Management System

MN-CMS Team.

The Maternal and Newborn Clinical Management System (MNCMS) has been live in the National Maternity Hospital since January 2018. First introduced as a maternal and newborn record only, it has since expanded to cover gynaecology and colposcopy services thereby providing a paperless electronic health record for the whole hospital. The ethos of MN-CMS is 'patient centred, clinically led' and the MN-CMS team work closely with the HSE National MN-CMS Team and the other participating maternity hospitals to support, manage and upgrade the system.

Apart from other patient documentation, MN-CMS enables medication prescribing and administration, ordering and viewing laboratory investigations and electronic communication with general practitioners. It also interfaces with other specialist systems such as fetal cardiotochograms (Fetalink), theatre (Periop Doc) and anaesthetic records (SN Anesthesia), ultrasound (Viewpoint), and Patient Management System (IPMS).

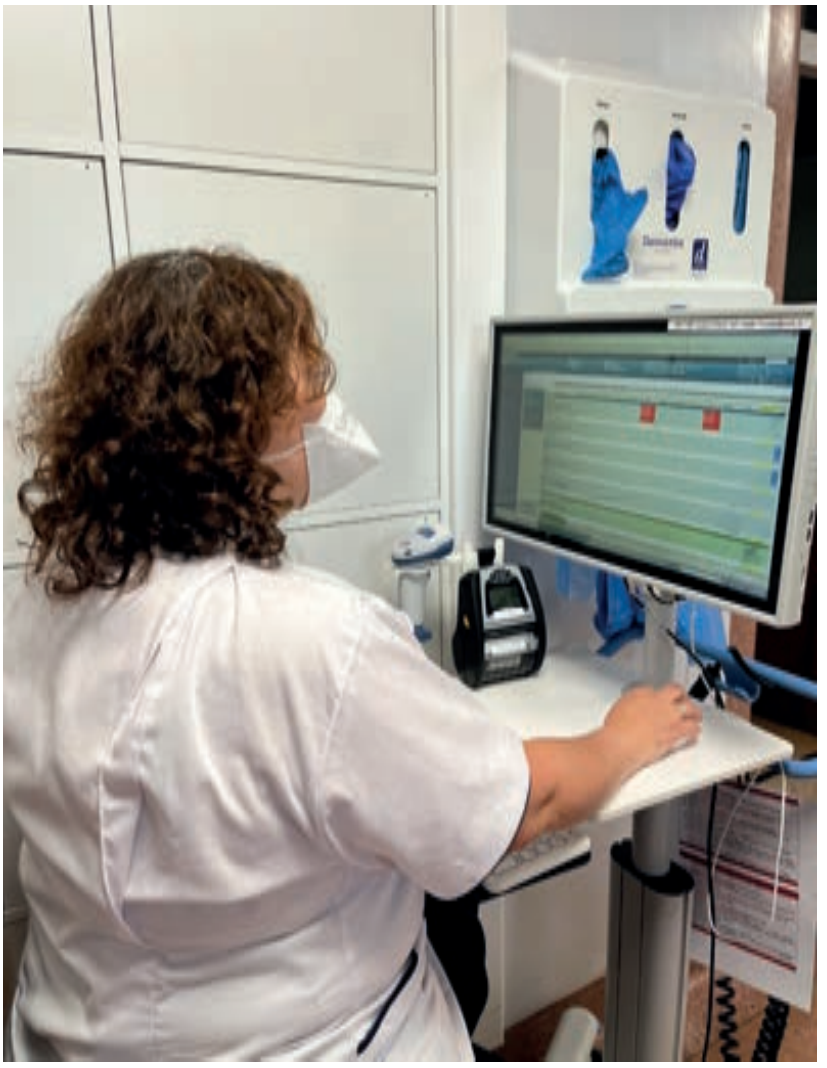
The MN-CMS Department, along with AMS, provides the hospital with support to enable the continuous 24-hour use of the system and ensure the most efficient use of the electronic chart so both the patient and healthcare users get the maximum benefit from the system.

Continuous training, creating and maintaining user access to MN-CMS are essential pre-requisites to all the other support functions of the Department. MN-CMS training is provided in our state-of-the-art computer training facility. All new and returning users require training and in the last year the team has trained more than 350 staff, including doctors, midwives, nurses, allied health professionals, students and administration staff to use MNCMS. Again in 2021, COVID-19 has meant that face-to-face training has had to be limited and strict COVID-19 protocols put in place. Online teaching tools for MN-CMS are also available on HSELand and the NMH e-learning hub.

New clinic and 'ward build's within MN-CMS are essential in line with structural developments in the hospital and requires a significant amount of planning and hard work. In line with any changes either to the software of the system or the architecture of the hospital means extensive testing has to be carried out by the MN-CMS team prior to release, to ensure the Powerchart build matches the new structure and the software is working as designed.

The main support by the MN-CMS team is the phone and email support as well as the face-to-face support which are all essential parts of any large electronic system. It is that support that has enabled the acceptance of the system and gained the trust of the users even though at times any problems with access can be very frustrating to everyone. Pager and phone support is available Monday to Friday, while phone support, provided by AMS, is available out of hours. The local team also provide cover outside of core working hours for any planned downtime or upgrade to the system.

In May 2021, the HSE cyberattack caused all HSE centralised computer systems to be taken down which resulted in MN-CMS being unavailable for a period of 7 weeks. This was a very challenging time for the hospital and meant that the hospital had to revert to paper charts for all patients. Luckily, the MN-CMS data was not damaged during the cyberattack and was ultimately restored intact. After restoration, a large amount of data had to be back loaded and patient notes scanned into MN-CMS to be available for reporting and reference in the future.



Laura Segura Blanco, Fitzwilliam Wing Midwife documenting on the MN-CMS.

Also due to the HSE cyberattack, planned upgrades to MN-CMS in 2021 had to be postponed, but it is hoped to proceed with a number of enhancements, including an upgrade to the iBUS environment, in 2022.

One of the great challenges of healthcare is routine data collection and concise but complete documentation. It is the first measure of quality of care and although we are improving we still have a long way to go. The challenge then will be to maintain it. Throughout 2021, the team have been involved in daily data quality monitoring and a significant amount of time continues to be taken up by first checking for and then following up on incomplete documentation.

As far as the future is concerned, the MN-CMS electronic health record continues to evolve through a centralised national structure. As more and more users realise the benefits, more and more requests are made for enhancements. In 2021 a change freeze post cyberattack meant that there was limited scope for modifications but urgent requests were still attended to. As time progresses, the ability to provide changes and enhancements will depend on clinical priorities, national agreement and available resources. The main national aim at the present time is to enable all maternity, neonatal and gynaecology hospitals in Ireland to have the same electronic health record and to be the first country to achieve that goal.

On a local level, 2021 has been a challenging year for us but the MN-CMS Team continues to work with all areas of the hospital to get the most from our electronic health record. Our aim is to support and guide users on every aspect of MN-CMS to achieve the maximum benefit for our patients and us all as health care users.

Emergency Department

Antenatal Patient, Sabrina Collison.

On the 31st January 2018, The National Maternity Hospital opened a dedicated Emergency Department, providing a 24 hour / 365 emergency service for pregnant, postnatal and gynaecology patients. This is a purpose built facility and replaces a service that had been spread across many clinics in many locations; the move is a very positive improvement in the care of these women who present to the hospital at a difficult time.

The new space consists of a triage room and four treatment rooms. Each room is equipped with diagnostics allowing for the full episode of care to be completed in the one room. This ensures that each woman has privacy while being assessed, examined and cared for. Since January 2019, following the Health (Regulation of Termination of Pregnancy) Act 2018 this facility also provides 24 hour / 365 emergency service for women following termination of pregnancy.

The unit is now in operation for over four years and usually sees almost 1,000 emergency a month for a range of conditions including reduced fetal movements, hyperemesis, hypertension, early pregnancy pain/bleeding, postnatal complications and many gynaecological emergency presentations.

The staff in the Emergency Department also provide a telephone service for women and GP's. This service is an invaluable resource for women reassuring them and ensuring that they are cared for in the most appropriate setting at the most appropriate time for their complaint.
The COVID-19 pandemic had a dramatic impact on the service during the year. Structural changes involved converting all the rooms to negative pressure.

At the peak of the first wave, all non-essential services ceased, which allowed use of the facilities in the adjacent Gynaecology Outpatient Clinic to carry out the service. This reserved the Emergency Department exclusively to care for COVID-19 cases. Division of staff between the two areas often proved difficult as staffing levels were diminishing at this time. When services were reintroduced later in the year, all care had to revert back to the department which brought with it challenges to ensure the safe provision of care for all women attending the department. Strict adherence to local and national guidelines were essential regarding social distancing in waiting room areas and personal protective equipment.

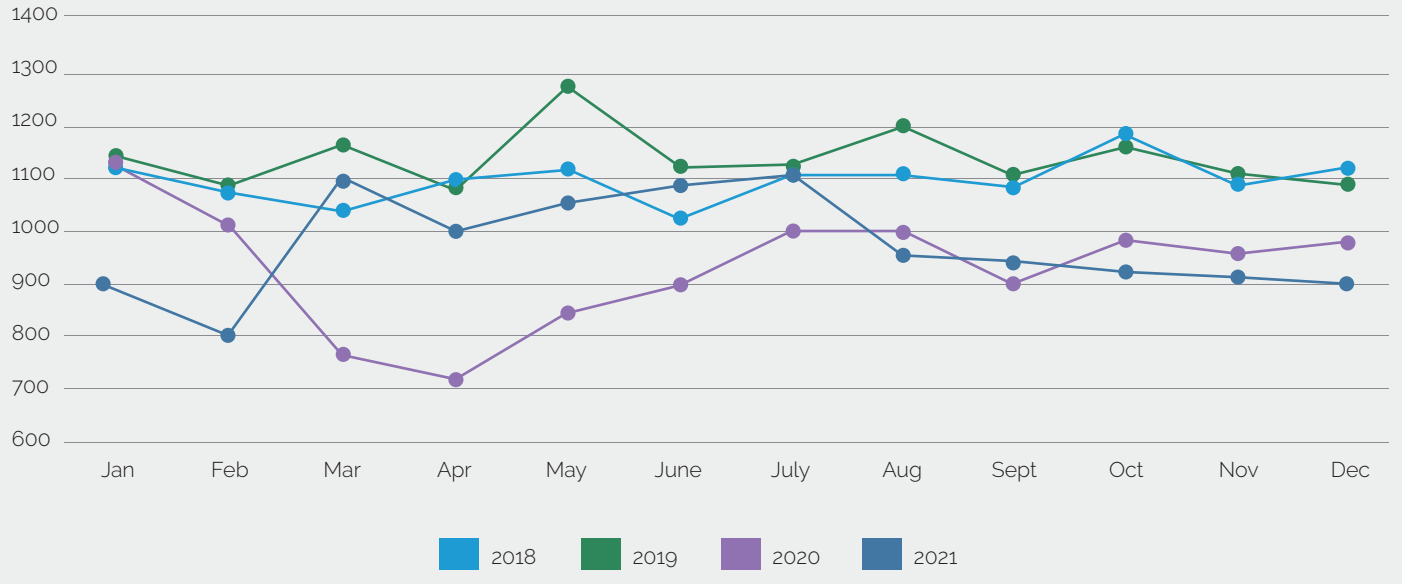
All COVID-19 antenatal, postnatal and gynaecological women were cared for in the department during the crisis thus having an impact on the normal flow of women attending the department due to the necessary decontamination of each room after use many times throughout the day. The Emergency Department staff also provided a staff swabbing service in association with the occupational health department during the year and are to be commended for their flexibility, cooperation and support throughout these difficult times.

Activity

The decrease in attendances is as a direct result of the pandemic.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2021	911	842	1099	1015	1061	1011	915	1110	955	966	929	900	11714
2020	1132	1003	749	709	840	887	994	998	888	989	956	970	11115
2019	1127	1074	1156	1074	1271	1132	1129	1207	1104	1155	1088	1080	13597
2018	1115	1076	1036	1079	1119	1010	1111	1108	1076	1181	1077	1109	13097

Emergency Room Attendences 2018 to 2020



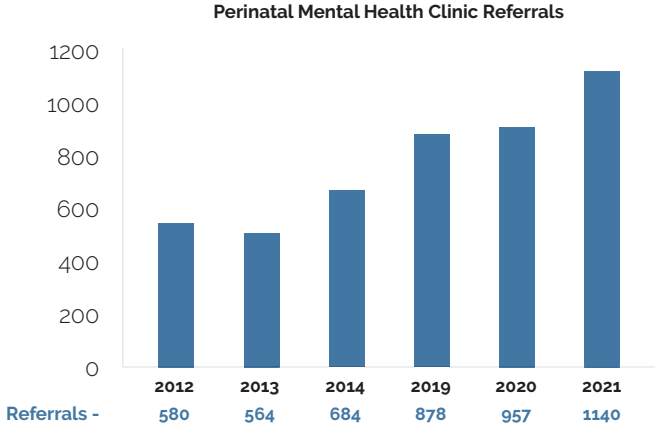
Perinatal Mental Health

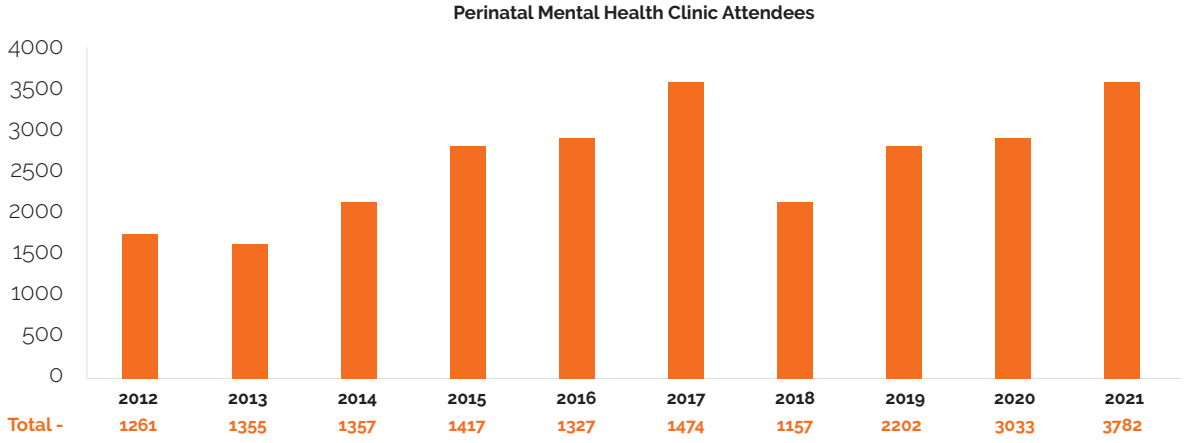
In November 2017, the National Specialist Perinatal Mental Health Model of Care was launched. This strategy document planned for the development of Specialist Perinatal Mental Health Services, (SPMHS) in all maternity units in the country. This would involve the development of specialist teams requiring funding and the recruitment and training of staff for these posts. A National Oversight and Implementation Group (NOIG) was then set up to oversee the roll out of this model of care.

In The National Maternity Hospital, this has allowed for the development of the multidisciplinary team which in 2020 welcomed a new Clinical Nurse Specialist (CNS) and mental health midwife (MH Midwife). It is planned that the team will recruit an additional CNS and MH Midwife in 2021 and develop a new specialist post for a Senior Occupational Therapist. Dr McCarthy and Adele Kane are members of the NOIG. The Model of Care includes a plan to open the country's first Mother and Baby Unit as part of the Department of Psychiatry at St Vincent's University Hospital and Dr McCarthy is a member of the planning group for this.

The SPMHS provides for mental health care needs from the booking visit to up to 1 year after birth. We will also provide specialist pre-conceptual advice. The expansion of the team has coincided with significantly increased referral to the team and attendance at clinics (see graph below). The COVID-19 pandemic posed particular challenges for patients and staff with a marked increase in demand for telephone consultations and online video calls. This was facilitated using the HSE's Attend Anywhere service and all of the team were provided with laptops for this.

The SPMH team provides support and training for the Mental Health Midwife appointed at Wexford General Hospital and are at an advanced stage of planning to provide and remote tertiary referral clinic for maternity patients attending the midwife at hospital. The team provide ongoing teaching for UCD and RCSI medical students, UCD midwifery students, and for Social Work and Psychology students also. Of note, the Charter Day speaker for 2020 was, for the first time, a Perinatal Psychiatrist, Dr Roch Cantwell from Glasgow who is the lead psychiatry assessor for the UK and Ireland Confidential Enquiries into Maternal Deaths. The team also provided key support to the Placenta Accreta Group Dr McCarthy is the Clinical Lead for Schwartz rounds which have been successfully continuing in the hospital throughout the pandemic.





Pathology and Laboratory Medicine

Dr Eoghan Mooney, Consultant Histopathologist with Prof Shane Higgins, Master at the Charter Day Symposium.

The laboratory service covers the scope of Pathology and Laboratory Medicine with Biochemistry, Blood Transfusion, Haematology, Histology and Microbiology laboratories. The service is provided 24/7 in accordance with clinical need. In addition, a microbiology service is provided for the Royal Victoria Eye and Ear Hospital. Our Endocrinology service has expanded over the past few years and this is a developing area. In addition to tests provided 'in-house' the department manages specimens referred to reference laboratories. The histology service incorporated a perinatal pathology service.

Accreditation of the services to ISO 15186 was retained in 2021 through a virtual inspection. Extensions to scope were added and the accolade of flexible scope was retained. We gained and lost staff during the year. Mr Luke MacKeogh retired from his post as Chief Medical Scientist in Haematology after 40 years' service to the hospital. Orla Cormack was acting Chief in Blood Transfusion while Natalie Keogh was on leave. Mr Padraig McGarry left to take up a role as Chief Medical Scientist in the Mater Private Hospital and Mr Donal Noonan and Ms Aoife Reynolds were appointed as Senior Medical Scientists in Blood Transfusion. Ms Ellen McCourt and Ms Órla O'Donnell joined the team. All medical scientists are compliant with statutory regulation requirements. See Figure 2: Laboratory Requests Summary and Figure 3 Change in Workload at the end of this chapter.

Clinical Activity

The challenge of responding to the SARS CoV-2 pandemic continued throughout 2021. The new molecular laboratory, and the microbiology staff, worked tirelessly to ensure that testing was provided supporting patient and occupational health needs. The microbiology staff provided a special Sunday service for SARS CoV-2 testing to ensure scheduled admissions could be managed safely. Reporting via CIDR and to the HSE data lake continued daily to facilitate case tracking and tracing.

As if the COVID-19 pandemic was not enough, May brought another challenge, that of a cyber-attack which prevented the electronic requesting and reporting of results. It is a testament to our colleagues in IT that our own servers remained functioning. Our Laboratory Information System continued to function and for much of the down time was the only source of reference for hospital numbers. Nevertheless, we were without full systems for about 7 weeks and then we needed verification of outstanding result filing to the electronic chart. All this took place while Clinical Activity returned to 2019 levels and beyond.

Successes and Achievements

The major success and achievement is the development of our new molecular suite with facility for both rapid and batch analysis of molecular microbiology tests. This service is now operating seamlessly. In addition, the microbiology staff verified the Malditof and film analysers for rapid identification of microbes. These rapid methods reduce the time to treat infections. Point of care testing for glucose with quality assurance governance was introduced successfully. The Biochemistry department successfully transferred Free HCG and PAPP-A to a new platform and introduced assays for both sFLT and PlGF.

The laboratory was very well represented at the NMH research and innovation Day with an excellent 2nd prize presentation by Grainne O'Dea outlining the molecular journey to SARS CoV-2. Ms Carly Keegan and Ms Sarah Brady completed the Masters in Biomedical Science.

Challenges

The major challenge was to continue to provide a safe effective service meeting clinical need during a pandemic and to ensure staff safety. The infrastructure of the laboratory continues to be a challenge, particularly in histology, and this was partially addressed in 2021. The department provides a multidisciplinary 'on call' service which is staffed by 2 medical scientists every day.

Training scientists to provide this service and ensuring that their competence is retained by 'update' training is a challenge particularly in a period of pandemic with space restrictions and staff working flexible rosters. This challenge was particularly acute at year end as the case numbers rose among staff. The willingness of scientists to cover at very short notice over the Christmas and New Year period is a measure of their commitment to the hospital, its patients and to each other. Unfortunately, due to the cyber-attack and subsequent lack of access to testing domains, some of our plans for 2021 have been delayed to 2022.

Plans for 2022

- Plans to reconfigure Histology Laboratory and Perinatal Pathology Service
- New analysers to be verified in Histology and Haematology
- Introduction of eCrossmatch
- Commissioning of new chemistry analyser
- Expansion of molecular microbiology services
- Commissioning of a new instrument interfacing system for analysers permitting greater flexibility and rule based functions.
- The department purchases a significant range of consumables for the hospital. These will move to an ordering system for improved security and governance.

QUALITY MANAGEMENT

Service Overview

The Department of Pathology and Laboratory Medicine is committed to promoting and providing the highest quality diagnostic and consultative services for all its users. The department is committed to the implementation of the National Maternity Hospital mission statement. These commitments are defined within the Laboratory Quality Policy. The department defines and audits the quality management system to ensure compliance with the ISO 15189 standard.

Activity

The Department of Pathology and Laboratory Medicine maintained accreditation across all disciplines to the ISO 15189 standard, in addition to being awarded an extension to scope for additional tests. By successfully retaining the flexible scope of accreditation system, the laboratory was able to provide an uninterrupted accredited service as quality improvement initiatives were introduced. The laboratory submits an Annual Report for Blood Transfusion to the Health Protection Regulatory Agency (HPRA) documenting the activity for the previous year and reports of blood usage, wastage and planned changes within the department. The 2021 report was successfully submitted and accepted by the HPRA.

Successes and Achievements

A number of service delivery improvements were implemented in 2021 which expanded the suite of accredited tests provided by the laboratory. This was achieved by a combination of engagement with the flexible scope of accreditation system, in addition to assessment of change management projects by INAB during our annual surveillance visit.

Additions to our scope (detailed in the departmental reports) in 2021 included:

- The verification and implementation of the molecular GeneXpert platform in the Microbiology department for rapid testing.
- The verification and implementation of the MALDI-TOF VITEK analyser in the Microbiology department for the identification of micro-organisms.
- Flexible scope utilisation to introduce a new Malaria testing kit in the Haematology department.
- Flexible scope utilisation to introduce the sFlt-1/PlGF ratio test and Free hCG & PAPP-A testing on the Roche Cobas e601 in the Biochemistry Department.

The laboratory has a well embedded formal change management system. The laboratory raises changes on Q-Pulse when opportunities for service improvement arise, subsequently enhancing the quality of the laboratory testing provided to the patient. Numerous Change Managements were implemented within the laboratory in 2021, in response to the ongoing COVID-19 pandemic and other initiatives:

- The verification of the Roche HE600 Autostainer & Roche Benchmark Ultra analyser for immunohistochemistry testing in the Anatomic Pathology department.
- Verification of the Sysmex XN-2000 analysers for FBC testing in the Haematology department.
- Introduction of the Electronic Cross-matching service in the Blood Transfusion department, and implementation of the National Transfusion Advisory Group (NTAG) guideline for use of CMV negative blood components.
- Introduction of the Roche Accu-Chek glucometer devices for point of care glucose testing by the Biochemistry department.
- Verification of several new processes in the Microbiology department to further expand testing on the Film Array, GeneXpert and MALDI-ToF platforms.
- Update of the laboratory risk management system to align with the hospital risk management rating.

The laboratory is committed to providing a quality laboratory testing service to support excellent patient care. Internal and external audits of our service are completed annually to ensure that all aspects of our service are compliant with relevant ISO standards, EU Directives and best-practice guidelines. Opportunities for improvement are identified and incorporated into follow up audits. All areas of the quality management system are audited on an annual basis. See Figure 1: Audits performed in the Department of Pathology and Laboratory Medicine 2021.

Plans for 2022:

- Maintenance of INAB accreditation service.
- Expansion of the Flexible Scope of Accreditation system to Microbiology in 2022.
- Consider further expansion of the Flexible Scope of Accreditation system to Blood Transfusion and Anatomic Pathology in 2023/2024.
- Prepare and distribute the 2021/2022 laboratory User Survey.
- Standardisation of the POCT service.
- Continued focus on CPD and reflective practice.

BIOCHEMISTRY

Service Overview

The Biochemistry department provides an extensive range of Biochemistry, Endocrinology and specialised fetal monitoring for both the NMH and other hospitals.

Clinical Activity

The Endocrinology service continues to expand with increases in thyroid function testing and support for the diabetes clinics. The verification and introduction of PlGF and sFLT /PlGF ratio now permits better monitoring and triage of patients with suspected pre-eclampsia

Successes and Achievements

- Continued verification and introduction of new immunoassay analyser permitting improved turnaround times and increase in test repertoire.
- Transfer of 1st trimester biochemistry to new platform
- Verification and introduction of Point of Care Glucose Meters throughout the hospital
- Introduction of PlGF and sFLT /PlGF ratio

Plans for 2022

- Verification and introduction of indices to standardise reporting of lipaemic, icteric and haemolysed specimens
- Prepare tender for replacement of chemistry analyser

- Standardise Point of Care testing and governance
- Seek a solution to offer HbA1c 'in house' to improve patient care for diabetics
- Verification of a new method for Gentamicin analysis.
- Verification and introduction of in house testing for Progesterone analysis

BLOOD TRANSFUSION

Service Overview

Investigation of Blood Group and Antibodies. Provision of Blood and Blood Products. Supporting the prevention and management of Haemolytic Disease of Fetus and Newborn through detection and monitoring of antibodies, provision of routine Antenatal Anti-D prophylaxis. Following review of results of fetal RhD screens analysed in IBTS.

Clinical Activity

The introduction of the cell free DNA testing to establish fetal RhD status has led to a significant reduction in the administration of antenatal prophylactic anti D both for potentially sensitising events and for the routine prophylaxis at 28 weeks. Continued monitoring of obstetric haemorrhage by a multidisciplinary team has led to significant reduction in use of blood and blood products.

Successes and Achievements

Implementation of automated Rh and K phenotyping

- Implementation of Blood Transfusion Massive Haemorrhage Training Improvement Plan
- Implementation of the NTAG CMV negative guideline at the NMH
- Change from plasma reduced CPDA-1 paediatric emergency unit to SAGM paediatric emergency unit <5 days old

All other plans impacted by cyber-attack and lack of user acceptance testing system

Plans for 2022

- Implementation of electronic issue
- Introduction of electronic reporting of Fetal Rh D screens from IBTS
- Verification of titre score to reduce referrals for Anti D Quantitation
- Elimination of the compatibility report
- Verification of Prophylax panel testing on the IH1000

HAEMATOLOGY

Service Overview

The haematology laboratory investigates blood disorders and is critical for the detection and management of anaemias, sepsis and coagulation disorders. In addition, Kleihauer tests are used to estimate fetomaternal haemorrhage.

Successes and Achievements

- Acceptance and verification of Sysmex XN FBC analyser
- Progress delayed by cyber attack

Plans for 2022

Complete verification and introduce the new Sysmex XN FBC analyser

- Procurement of analyser for provision of improved haemoglobinopathy screening to comply with guidelines and to link this with the Biochemistry plan for provision of HbA1c.

HISTOLOGY

Service Overview

The histology provides a diagnostic service examining tissues arising from surgical specimens taken in theatre, placentae and a perinatal pathology service. The department supports the cervical check programme and the gynaecology clinics

Clinical Activity

During 2021 the department worked closely with the bereavement team and on the identification of Covid Placentitis. Discussions on the provision or a regional perinatal pathology service are ongoing

Successes and Achievements

- Reconfiguration of instrumentation area
- Installed and verified new staining processor
- Installed and verified the Immunohistochemistry Analyser and its detection methods for a range of antibodies
- Optimised the Sars-CoV2 antibody for the identification of Covid Placentitis

Plans for 2022

- Work with Executive Management Team and the Ireland East Hospital Group to provide a regional perinatal service. This is contingent on a reconfiguration and relocation of the department into appropriate premises.
- Introduce ISH methods to the department

- Review storage of paraffin blocks
- Introduce voice recognition for dictation

MICROBIOLOGY

Service Overview

The Microbiology laboratory provides a routine bacteriology testing and molecular microbiology service for both the National Maternity and Royal Victoria Eye and Ear Hospitals. Surveillance reporting is provided for both hospitals

Clinical Activity

In addition to provision of the routine service 2021 was dedicated to routine provision of testing for Sars-CoV-2. There are 3 platforms available for provision of this service.

The department now supports all the testing needs, patients and staff, for the 2 hospitals. Using agreed algorithms swabs are analysed from all in patients and prior to planned surgery via pre assessment clinics. Surveillance reports for MRSA colonisation, rectal screening, influenza rates and blood stream infections are provided to guide infection control. Daily reporting of Sars-CoV-2 testing and infection rates is supplied to the HSE.

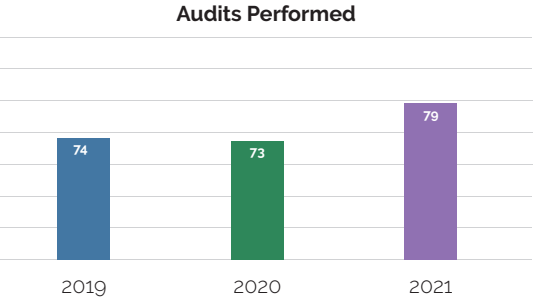
Successes and Achievements

- Verification and accreditation of VITEK MS Maldi-TOF analyser for rapid identification of microbes.
- Accreditation of the GeneXpert analyser covering 6 assays: Rapid GBS, Influenza/RSV, Novovirus, C. difficile, confirmatory testing of MRSA / Staphylococcus aureus from bacterial isolates and confirmatory testing of Carbapenem Producing Enterobacterales (CPE) from bacterial isolates.
- Verification of the FilmArray BCID panel for the rapid identification of designated pathogens from positive blood cultures.
- Implementation and verification of a 2nd Aus Diagnostics analyser to perform Sars-CoV-2 testing.
- Verification of FastRead slides for performing cell counts from urines, CSF, sterile fluids, replacing the Kova Glasstic slides.
- Verification of the BacT Alert Blood Culture analyser, post move to a new location within the laboratory.
- Accreditation of CPE and VRE screening and CPE identification methods.
- Re-Introduction and verification of ESL screening from neonatal rectal screens.
- Verification of additional antimicrobial agents, as per EUCAST 2021 updates.

Plans for 2022

- Seek accreditation for molecular testing on the GeneXpert platform
- Seek accreditation for the Maldi-TOF
- Verify the Film Array
- Expand the molecular testing repertoire on the AUS Diagnostics
- Verification of the VITEK MS Maldi-TOF for the identification of yeast isolates.

Figure 1: Audits performed in the Department of Pathology and Laboratory Medicine 2021

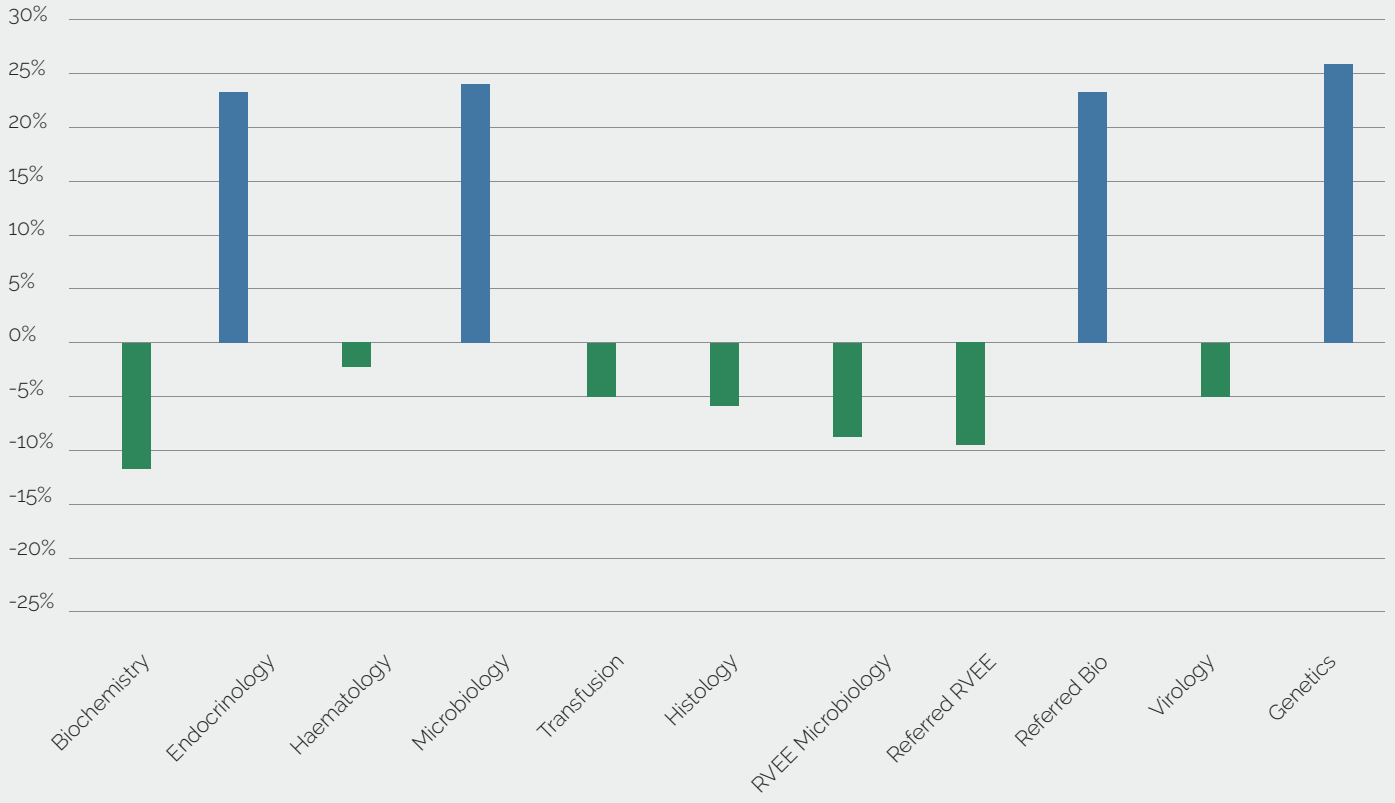


Reference:

T Yee Khong, EE Mooney, PGJ Nikkels, TK Morgan, SJ Gordijn, eds: Pathology of the Placenta: a Practical Guide. Springer Nature Switzerland 2019. ISBN 978-3-319-97213-8

Figure 2: Laboratory Requests Summary

Figure 3: Change in workload (%) 2021 vs 2019. Comparison 2021 with 2019 as 2020 was not a representative year.



Pre-Assessment Clinic

The Pre-Assessment clinic was established in June 2020 to enhance the efficiency of the theatre service and reduce the number of patients who fail to attend for surgery. A dedicated Clinical Nurse Manager was appointed in October 2020 and this has further enhanced the efficiency of theatre scheduling. The clinic is nurse-led with support from an Anaesthetic Consultant and an Anaesthetic Registrar.

The objective is to enhance the clinical care of patients by conducting timely assessments, identifying health issues and arrange prompt treatment in advance of scheduled surgery. This leads to a reduction of cancellations and a reduced bed occupancy prior to surgery. The continuing COVID-19 pandemic has necessitated all those for surgery under general anaesthetic to attend for screening within 48-72 hours of their surgery. Timing of appointments is arranged by administrative staff and along with the COVID-19 PCR swab, the clinic aims to facilitate discussion regarding the surgical procedure.

The appointment also allows for improved patient education and allays any concerns. A new electronic referral pathway has been introduced which will enable consent to be taken at the gynaecological clinic and immediately be documented in the chart. At the clinic general checks of blood pressure, temperature, pulse oxygen saturation and respirations are performed. Height and weight are recorded giving a BMI score. Blood tests are taken as necessary and an ECG is performed if indicated. COVID-19 swabs and other screening swabs are taken as necessary.

Of the 1,750 patients assessed, 1,615 patients attended the PAC in 2021 a further 135 virtual assessments were undertaken for those with scheduled minor surgical procedures. 872 women have been seen for full surgical work up in 2021, and a further 743 women were swabbed prior to their elective caesarean section. The clinic is held on Monday, Tuesday Wednesday and Friday each week. For the duration of the pandemic the PAC will continue to see all gynaecological cases and only those patients for caesarean who are considered high risk. The table below gives the monthly activity of the clinic for the year 2021.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Gynae procedure	60	77	106	73	72	83	67	68	77	66	74	49	872
LSCS for swab	83	77	66	84	80	60	81	54	46	40	52	20	743
Virtual attendances													**135**
Total attendances	**143**	**154**	**172**	**157**	**152**	**143**	**148**	**122**	**123**	**106**	**126**	**69**	**1750**

**From August 2021 only unvaccinated women booked for elective caesarean section were screened in the pre-assessment clinic. All others were swabbed on the day of surgery.*

Danuta Kuzniak and Manjit Gharpure CDU Technicians in the Hospital Sterile Services Department preparing to load the new autoclaves which hold 6-12 RIMD sets.

Hospital Sterile Services

The Hospital Sterile Services Department (HSSD) is committed to the highest level of quality in the decontamination (cleaning, disinfection and sterilisation) of Reusable Invasive Medical Devices (RIMD). Sterility assured reprocessing of RIMD is achieved through adherence with Decontamination Policies, Procedures and Guidelines.

Activity levels continue to remain high year on year. In total 33,543 packs were sterilised in 2021. COVID-19 restrictions and the cancellation of some elective theatre cases did not have much impact on the productivity in HSSD. Non-conformance / complaints were 3.5% of production. There was 98 hours downtime for the year, which was a significant drop from the previous year.

Works commenced in June 2021 for an interim Autoclave/Despatch area with great thanks to the EMT and Facilities Engineering Department. CDU retrofit finished in late August, external works commenced in September to increase the reversal osmosis water tank capacity. Two new autoclaves were installed in late October and commissioning and hand over to NMH was achieved at the end of October. The department needs to be relocated urgently to replace aging decontamination equipment and to comply with decontamination standards. All staff are up to date on mandatory training and manual handling. Due to the COVID-19 pandemic restrictions, no decontamination training days took place.

Quality/Risk

A departmental risk register is in place on and there are escalation procedures should this be necessary. The following audits took place during the year: Daily Quality Control Audit, Weekly Automatic Control Test, Monthly Key Performance Indicators, Quarterly Hygiene Audits and Annual Infection Control Audit.

Infection Control

Four Environmental Monitoring audits took place in 2021 where we sampled the air and surfaces from all rooms and water from the reverse osmosis water treatment unit. The results were discussed at the quarterly Infection Control meeting

Audits were also carried out in Fetal Assessment on the manual and automated cleaning of 'Semi-Critical' probes. Hygiene services conducted monthly audits of HSSD.

Quality, Risk and Patient Safety

Quality

Throughout 2021, the Quality Department developed and led both new and continuous improvement initiatives across the NMH in conformance with departmental and hospital objectives. This was achieved through day-to-day operational activities and underpinned by the following governance entities:

- Clinical Governance Executive Committee: meeting monthly to review and approve the identification and implementation of evidence-based standards, policies, procedures and guidelines and assure compliance with all statutory and regulatory requirements.
- Quality, Risk and Health and Safety Committee: meeting monthly to assure operational quality and patient safety through continuous monitoring, evaluation and improvement.

The services of the Quality Department are data-driven and underpinned by three core data management systems:

- Patient Feedback Management System (supporting excellence in Patient Advocacy).
- Quality Improvement Registry.
- Audit Management System.

Externally, the Quality Department continue to represent the hospital at the Ireland East Hospital Group (IEHG) Quality and Patient Safety Forum.

Particular Quality Department activities during 2021 (*in the context of COVID-19 restrictions*) included:

- Continued improvement of all quality management systems.
- Participation in IEHG Management of Complaint Workshops (x2) for Complaints Officers.
- Proactive involvement with community partners to enhance integration, coordination and seamless delivery of care. This included GP Liaison Committee meetings (x3) and Patient Voice Group meetings (x5).
- Coordination and participation in NMH Postnatal Study Day, 'Snapshots of postnatal care'.
- Coordination and management of NMH's GP Study Day (virtual).
- Contributions to Patient Safety Awareness Week.
- Management of all Patient Feedback (130 written complaints: 18 x Level 1; 112 x Level 2;
- 13 x direct patient meetings).
- Implementation of Quality and Safety Walk-rounds (Holles Wing, Pembroke Wing and Pharmacy Department).
- Ongoing management of online NMH and NICU Patient Experience Surveys.
- Ongoing document control and management through continuous updating and use of the Q-Pulse.
- Development of eLearning content for the NMH online learning platform (Totara).

"Clinical governance, a component of healthcare governance, continues to be the framework through which we are accountable for continuously improving the quality and safety of our services and safeguarding high standards of care by creating an environment in which clinical care will flourish. ".

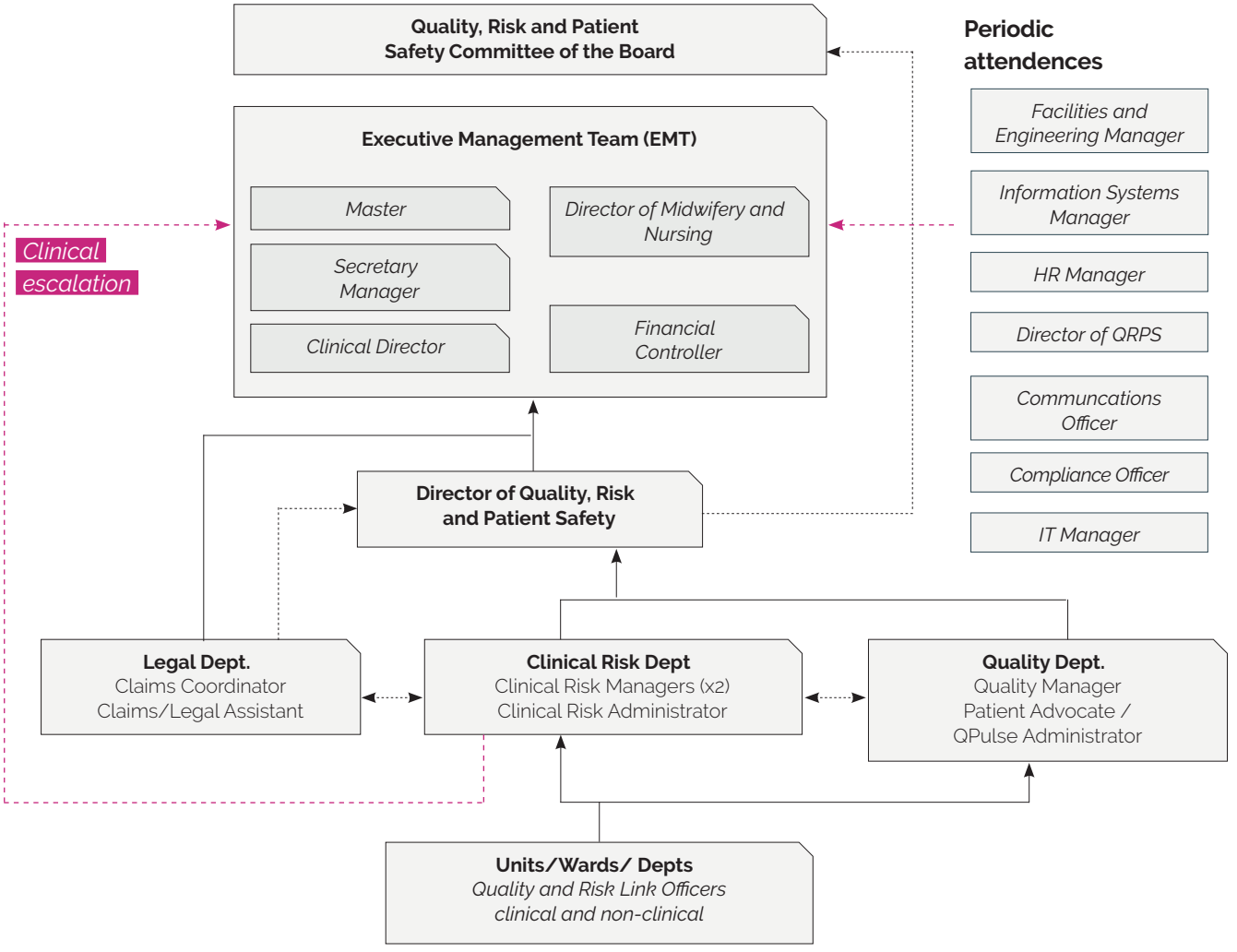
Governance

Clinical governance, a component of healthcare governance, continues to be the framework through which we are accountable for continuously improving the quality and safety of our services and safeguarding high standards of care by creating an environment in which clinical care will flourish. This requires the implementation and management of the 'pillars' of clinical governance - effective service provision, risk management, patient experience, communications, resource management, strategy and learning - all underpinned by the solid foundations of systems awareness, team working, ownership, leadership and collaborative team working of staff, patients, patient families and members of the public. Such implementation and management is evolving towards an effective Patient-NMH professional partnership.

Figure 1 presents the NMH's QRPS and related roles structures with Figure 2 presenting committee/group governance structures.

Within the Committee/Group Clinical Governance structures (Figure 2), a key component is the Clinical Governance Executive Committee (CGEC) which is responsible for:

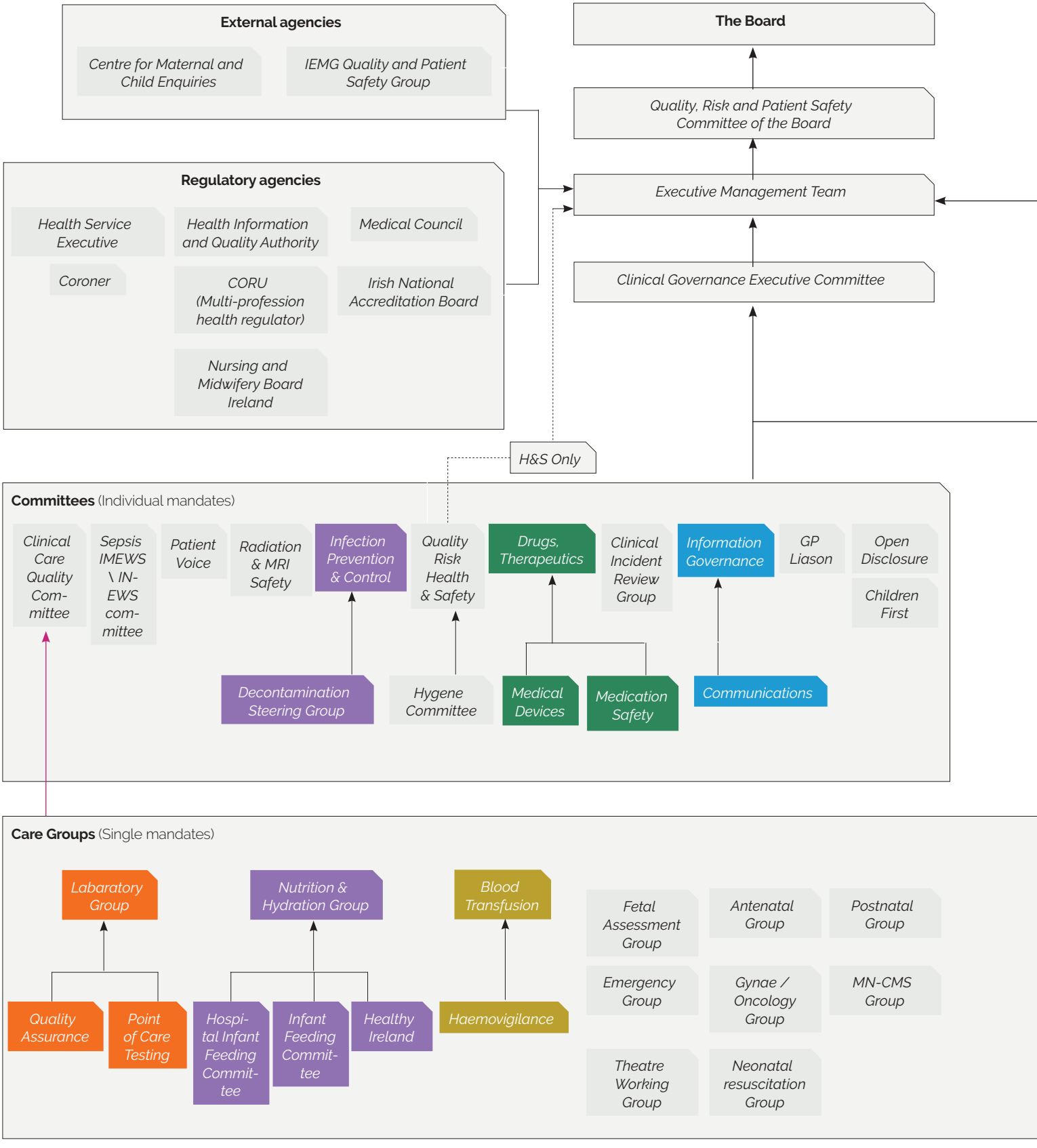
Figure 1: NMH QRPS and Related Roles Structures.
(***Please note:*** *the dashed lines indicate critical sharing of information rather than reporting*)

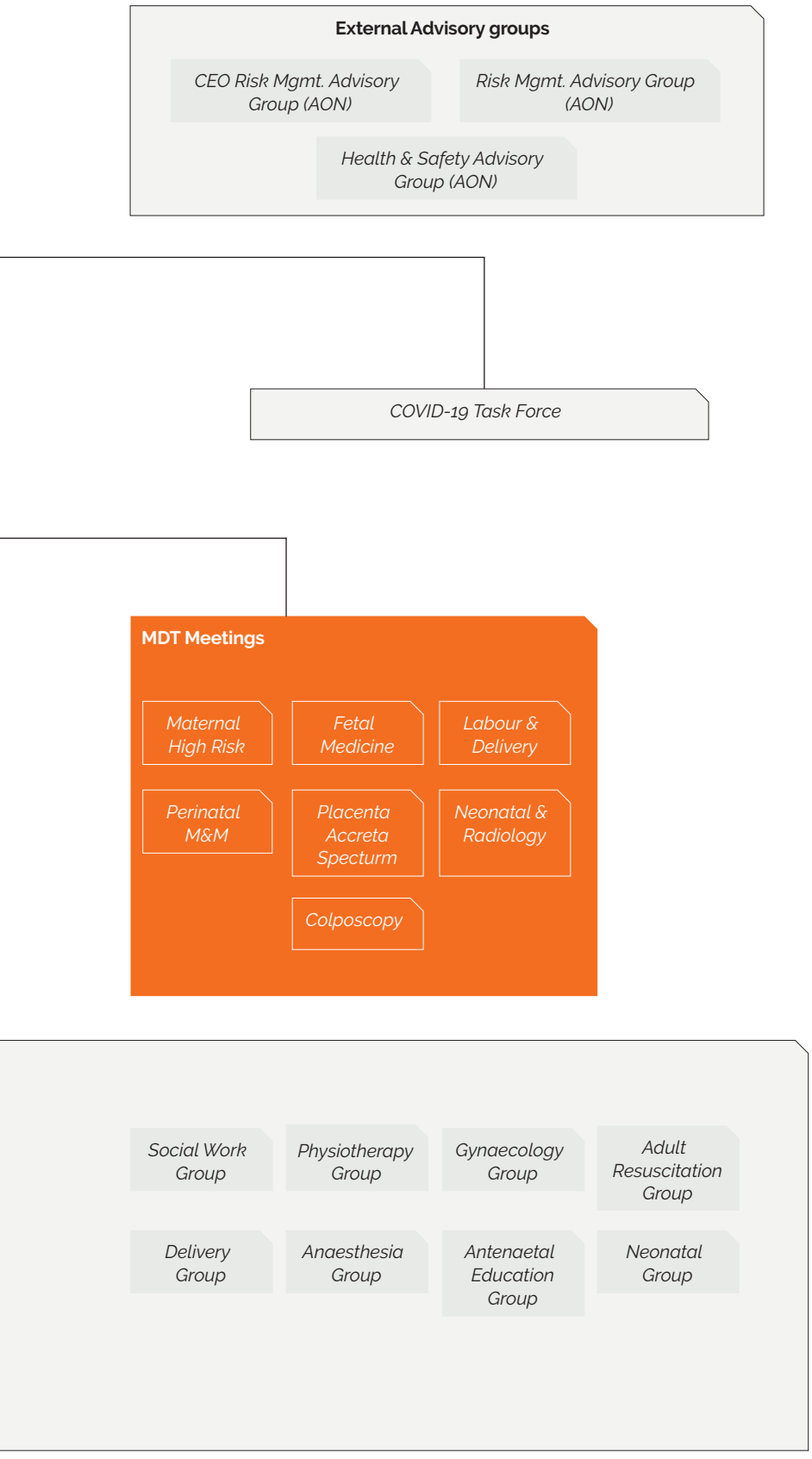


- The continuous monitoring and management of the quality and safety of our services by ensuring the integration of evidence-based clinical governance practice into frontline clinical practice.
- Increasing awareness of our key clinical challenges (risks and opportunities).
- The dissemination of key learning experiences.
- Critically encouraging and fostering a culture of quality, safety and excellence.
- Providing critical leadership and management oversight of clinical governance in the NMH.
- Determining the strategic development of clinical governance in alignment with broader NMH strategies.
- Ensuring continuous quality improvement through audit, review and management of "lessons learned".

The CGEC, chaired by the Master, meets on a monthly basis with membership including the Clinical Director, Director of Midwifery/Nursing, Secretary/ General Manager, Director of Neonatology, Director of Anaesthetics, Consultant Histopathologist,

Figure 2: Committee/Group Governance Structures





Consultant Microbiologist, Consultant Obstetricians and Gynaecologists, Clinical Risk Managers, Assistant Directors of Midwifery and Nursing, Director of Quality, Risk and Patient Safety, Quality Manager, Information Officer and Clinical Practice Development Coordinator.

During 2021 within our clinical governance structures, our Clinical Governance Executive Committee met monthly (N=12) and was supported by our Clinical Incident Review Group, meeting fortnightly with responsibility for on-going, multi-disciplinary, critical review of reported clinical events to underpin high standards of care.

Clinical Incident Management

The Clinical Incident Review Group (CIRG), reporting into the CGEC and chaired by the Clinical Director, is responsible for the on-going critical review of a range of clinical incidents which meets HSE Category 2 triggers (as defined by the HSE Incident Management Framework 2020) to facilitate the development of strategies for continuous quality improvement, maximise learning and to create and foster innovative changes to enhance patient care and safety.

The Group meets fortnightly with a core membership including the Clinical Director (Chair), Director of Midwifery/Nursing, Consultant Obstetrician and Gynaecologist(s), Neonatology/Paediatric Registrar(s), Obstetrician and Gynaecologist Registrar(s), Clinical Risk Managers, ADOM/Ns, Clinical Midwife Manager(s), Director of Quality, Risk and Patient Safety, Quality Manager and Clinical Practice Development Coordinator (other expert members are invited to attend as is determined by the incidents under review).

During 2021, the CIRG met on 24 occasions reviewing 326 Category 22 incidents out of a total of 1,786 clinical incidents reported.

[**Note 1:** 599 Category 2 incidents were reviewed by CIRG delegation (to Consultants, Assistant Masters and PPH Review Group - formerly PPH Audit Group) plus 58 Category 11 incidents were reviewed by the Perinatal Mortality and Morbidity meeting.]

[**Note 2:** The remaining 803 incidents were classified as Category 33 incidents and reviewed by our Clinical Risk Managers.]

1 Category 1 incidents are clinical incidents rated as major/extreme in conformance with NMH and HSE Risk Impact Assessment.

2Category 2 incidents are clinical incidents rated as moderate in conformance with NMH and HSE Risk Impact Assessment.

3Category 3 incidents are clinical incidents rated as minor/negligible in conformance with NMH and HSE Risk Impact Assessment.

Clinical Risk Management

The Clinical Risk Department manage operational risk and contributes to the management of corporate risk in full compliance with the HSE Risk Management Policy leveraging our cloud-based Risk Management System (RMS). Table 3 presents summary data for clinical risks managed during 2021.

Table 3: Overall Summary data for new risks 2021

Risk activity	Number	
	2021	2019-DATE
Operational risks recorded	44	677
Corporate risks recorded	5	14
Risks escalated within governance structures[4]	32	422
Risks inactivated/obsoleted	2	149

[4]A quality improvement initiative was launched in September 2021 changing escalation governance to the Clinical Governance Executive Committee.

Claims Management

It is not always possible to reduce claims and litigation, and it is therefore the aim and objective of the Legal Department to effectively and efficiently co-ordinate claims that arise.

In close collaboration with the State Claims Agency (SCA), the Legal Department manages the following types of claims - where clearly related to an incident:

- Clinical.
- Coroner's cases (from initial notification through to final resolution ensuring all claims/Coroner's cases are managed in a thorough and timely fashion in order to facilitate early decision-making in relation to liability and strategy - in close collaboration with, and support from, the Clinical Risk Department.).

The Legal Department coordinated 26 new claims during 2021 out of a total of 84 ongoing cases.

Clinical Governance Collaboration and Other Activities

As part of the Clinical Governance function, the Clinical Risk Department and Legal Department, work collaboratively to provide integrated, high quality clinical risk and legal management services delivered with understanding, compassion, integrity and respect. Together the departments also provide integrated day-to-day operational management of all NMH risks and incidents in compliance with appropriate legal and regulatory requirements (e.g. the State Claims Agency (via NIMS), HIQA, the HSE and the IEHG) as well as the critical support and management for staff involved in Coronial and legal processes. This includes the management and reporting of HSE Serious Reportable Events (SREs) on a quarterly basis (N=13). Additionally, the Clinical Risk and Legal Departments also significantly contributed to both external and internal professional development and training during 2021.

Other related clinical governance activities during 2021 included:

- Ongoing management of the NMH COVID-19 Action Log.
- Migrated the continuing implementation of the hospital-wide TeamSTEPPS 2.0 framework (Team Strategies and Tools for Enhanced Performance and Patient Safety) to the NMH's Totara eLearning platform.
- Step-by-step introduction of direct electronic incident reporting via the Clinical Incident Management System (facilitated by Zoho Creator). As of the end of 2021, 86% of clinical wards/units are direct electronic incident reporting.
- Many thanks to all colleagues across the hospital for contributing to the management of clinical risk, incidents and claims.

Dr Katie Flinn (SpR), Neonatology and Dr Caitríona Ní Chathasaigh, (SpR).

Sarah Fitzmaurice, Physiotherapist (left) and Orla Gavigan, Clinical Placement Co-ordinator teaching staff at Manual Handling Training.

Health & Safety

The National Maternity Hospital Health and Safety Department is dedicated to ensuring the safety, health and wellbeing of all our patients, staff, visitors and contractors. This is achieved by promoting and facilitating a safety conscious culture to ensure a safe environment and place of work in line with best practice.

The impact of COVID-19 has been felt across the hospital and many activities were restricted to mitigate against the threat. Three hundred and thirty-two individuals attended twenty-three Health and Safety Training sessions during the year which were favourably received by all. The induction program for staff is further complemented by the mandatory study day which is open to both clinical and non-clinical staff. This runs online regularly throughout the year and ensures all staff have an opportunity to refresh their health, safety and emergency procedures awareness. In addition, online training is now the preferred route for staff.

Fire Safety Consultants provided training for thirty-seven of our fire wardens in 2021. The hospital liaises closely with the Dublin Fire Brigade. Staff are involved in the mock evacuations conducted on a rolling basis it is hoped to revert to the standard evacuation which had being impacted due to COVID-19 restrictions. Ski sled awareness training is also provided during manual handling.

Contractor Management remains a key focus area especially in light of COVID-19 and recent developments. Additional minor capital projects undertaken improve site facilities and patient safety in the long term. These additional construction activities including the 'Internal Building Team' require the effective implementation of contractor management controls. Managers in control of the workplace and our contractors work together to ensure safe systems of work are in place and are working effectively.

The Annual Accident Review was conducted and there were a number of initiatives during the year to raise staff awareness of these hazards. All staff are engaged in working proactively with managing these risks to ensure a safe working environment for all our patients, visitors and staff.

Sincere thanks to all employees proactively working as a team to improve the safety culture within the Hospital. Thanks also to all members of the Quality, Risk, Health and Safety Committee which met on twelve occasions during 2021, to the Safety Representatives and Lead Worker Representatives, Support Services Teams, Nursing & Midwifery and clinical teams.

While 2021 has been a busy year it is likely that 2022 will be more challenging given the current COVID-19 constraints, scheduled projects and current financial environment.

Occupational Health

Saila Kuriakose, Clinical Skills Facilitator administering a COVID-19 vaccine to Anya Curry, Chief Medical Scientist.

2021 saw another busy year in Occupational Health (OH) which continues to provide a proactive service to all staff to maintain health and wellbeing within the workplace. The COVID-19 dedicated OH Department transferred back to OH late summer 2020 and was consumed into our working day. The winter season saw a huge increase in cases so we had a large caseload on a daily basis of screening symptomatic staff, arranging swabs where necessary, contact tracing and monitoring close contacts include those who returned from international travel.

There was also a change in the pregnancy guidelines in January so all current pregnant workers had to be notified and reassessed with regard to COVID-19 using a CARAI tool. The HSE guidelines changed frequently so keeping up to date with them was of the upmost importance while in turn relaying that to all staff via email and staff newsletter.

We were appointed a fulltime administrator in January who continued the daily database recording case and complying with the multiple reporting to Executive Management Team, HR and Ireland East Hospital Group (IEHG). The COVID-19 vaccine rollout began in January and was organised and staffed by a special committee of many disciplines in the hospital which ran very smoothly. Occupational Health dealt with any follow up queries and reassurance calls. We moved to the former 'Crosscare' facility in autumn 2021 which provides a more confidential space for staff to visit Occupational Health; it has both a clinical and administrative room.

We introduced a new electronic booking system 'eOPAS' which allows the recording and booking of all staff attending our department plus the attending physician (OHP) on a weekly basis. We plan to transfer all paper staff files over to the electronic system in due course. Consultations with OH Physician were up to 241 and 242 for OH Nursing and key services included pre-employment assessments, sickness absence reviews, vaccinations, pregnancy and ergonomics and first-aid assessments.

We have our yearly intakes of both undergraduates of BSC and HDip midwifery students and our bi-yearly intake of NCHDs. The cyber-attack in the summer

forced us to revert to paper medical pre- assessments for the NCHDs. Occupational Bodily Fluids exposure (OBE) continues to be monitored and now the Emergency Department deal with all OBE's outside the high risk areas of Theatre, Delivery and Neonatal Unit. We continue to perform our ergonomic assessments and this was in demand due to the COVID-19 guidelines so there was much configuring in many departments.

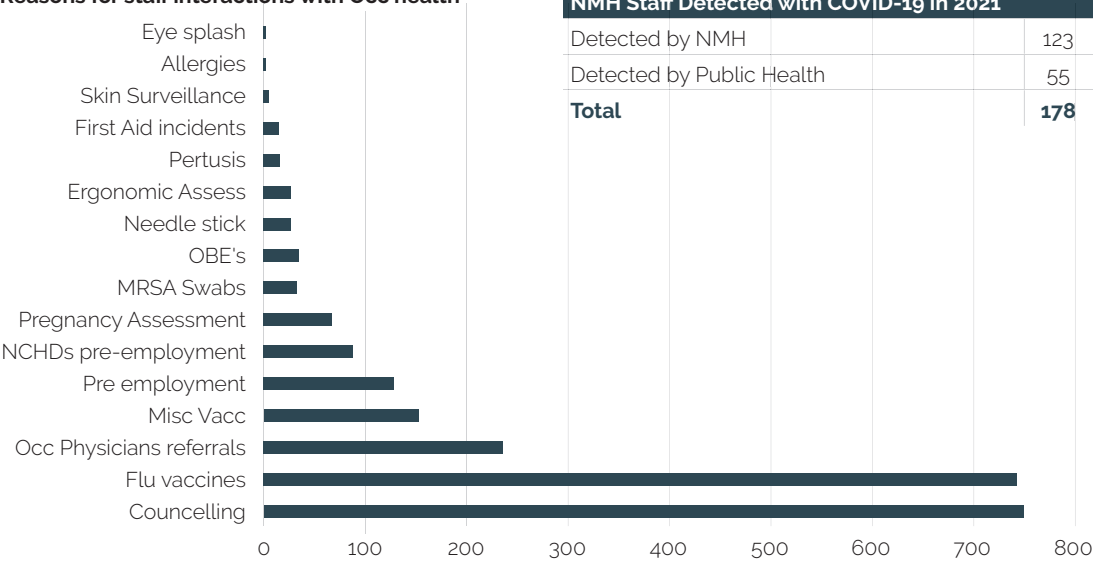
We also continue to liaise with Ballsbridge Physiotherapy Clinic for our muscular skeletal issues and are happy with their prompt service.

The Employment Assessment Programme has seen a significant increase in uptake since the COVID-19 pandemic and has greatly assisted staff in conjunction with our telephone and face-to-face drop-in service. Last autumn we appointed another full time staff member Jenny Fitzgerald CNN2, which brings us up 1.75 nurses and 1 fulltime administrator which helps hugely with the increasing workload since COVID-19 in 2020.

Flu Vaccine Rollout

The flu vaccine rollout commenced in October '21 and our total number was 71.2% for 2021/2022 season. We have peer vaccinators in most clinical departments which really helped expedite the whole process.

Reasons for staff interactions with Occ health



NMH Staff Detected with COVID-19 in 2021	
Detected by NMH	123
Detected by Public Health	55
Total	**178**

Mode of Anaesthesia for C-Section on MN-CMS

HSE Grade Category	Total Eligible Staff	Total Vaccinated Staff	Overall % Uptake
General Support Staff	155	78	50.3%
Health & Social Care Professionals	81	64	79.0%
Management & Admin	139	100	71.9%
Medical & Dental	102	88	86.3%
Nursing/midwives/students	425	309	72.7%
Other Patient & Client Care	43	34	79.1%
Total	**945**	**673**	**71.2%**

The National Maternity Hospital - (total 2021/22 uptake = 71.2%)

Infection Control Team

Infection Surveillance, Prevention and Control

The Infection Prevention & Control (IPC) Team consists of Dr Susan Knowles, Consultant Microbiologist, Ms Shideh Kiafar, ADOM Infection Prevention & Control, Ms Carol O'Connor, Surveillance Scientist, Ms Louise Delany, Antimicrobial Pharmacist and Ms Bincy Cyriac, CMS Infection Prevention & Control (until May).

The team works with colleagues across all areas of the hospital to ensure that the risk of a patient, visitor or staff member acquiring a healthcare associated infection is minimised. The team closely monitor infection rates, including device associated infections, caesarean section surgical site infection, maternal and neonatal blood stream infection, sepsis and meningitis, and multidrug resistant organisms. Antimicrobial stewardship and minimising development of antimicrobial resistance is a key goal of the IPC team. The team contributes to multi-disciplinary committees including Infection Prevention and Control Committee, Drug & Therapeutics Committee, Quality Risk & Patient Safety Committee, Decontamination Steering Group, Hygiene Committee, Sepsis and IMEWS Committee, and the COVID-19 Taskforce.

CLINICAL OUTCOMES

Sepsis and Septic Shock

- Four women developed maternal sepsis in 2021 (0.52 per 1000 maternities compared to 0.83 in 2020, 0.51 in 2019 and 0.88 in 2018).
- One woman developed septic shock and three had sepsis.
- Three infections were antenatal at 24 weeks, 37 weeks and 42 weeks. One was post TOP which was

performed in another country. All women survived.
- The organisms identified were Enterococcus faecalis and anaerobes (1), SARS-CoV-2 (1) and no organism identified (2).
- There was one post-op gynaecology patient who also developed sepsis. E. coli was identified in this case and the patient recovered.

Blood Stream Infection (BSI) and Meningitis:
- The rate of neonatal early onset group B streptococcal (GBS) disease was 0.38 per 1000 births in 2021, compared to 0.27 in 2020 and 0.62 in 2019. The rate of all laboratory confirmed organisms causing neonatal early-onset sepsis was 0.64 per 1000 births in 2021.
- There were 16 healthcare associated, neonatal late-onset blood stream infections in 2021. Six coagulase negative Staphylococcus, 2 S. aureus, 4 gram negative bacilli, 2 GBS and 2 polymicrobial BSI. In addition, there was one community acquired late onset S. aureus BSI.
- Five infants were diagnosed with meningitis in 2021. One was an early-onset GBS infection and 4 were late-onset (Klebsiella, Enterobacter, GBS and no organism identified). All infections occurred in infants born preterm between 25 and 33 weeks' gestation.
- There were 18 BSI in adult patients of which 3 occurred during the antenatal period, 6 intrapartum, 8 postpartum and 1 occurred in a gynaecology patient. The organisms identified were E. coli (4), GBS (3), anaerobic bacteria (2), Streptococcus species (6), E. faecalis (1), Listeria monocytogenes (1) and polymicrobial (1). Six (33%) of these 18 BSI were healthcare associated infections (HCAI).

Device Associated Infection, Surgical Site Infection and Clostridium difficile
- The central line associated bloodstream infection (CLA-BSI) rate in the NICU was 5.37 per 1000 catheter days in 2021 compared to 2.9 in 2020.
- The ventilator associated pneumonia rate in the NICU was 4.62 per 1000 ventilator days in 2021 compared to a rate of 0 in 2020.
- Due to the cyber-attack, 13 patients who had a possible superficial Caesarean section surgical site infection (CS-SSI) have incomplete clinical details recorded electronically to make an accurate assessment. Therefore, the CS-SSI rate was calculated as a range excluding these 13 cases (lower rate) and including all 13 cases as a SSI (higher rate). The CS-SSI was 5.0-5.56% in 2021; 4.2-4.9% following elective CS and 5.75-6.14% following emergency CS. This compared to 5.5% in 2020 (3.55% elective CS and 9.4% emergency CS).
- There was one case of Clostridium difficile infection in 2021, which is a rate of 0.2 per 10,000 bed days, compared to a rate of zero in 2020.
- Multi-Drug Resistant Organisms (MDRO)
- There were no MRSA bloodstream infections (BSI) in 2021.
- MRSA was detected in 30 infants. Of these 30 infants, 21 were hospital-acquired colonisation, 11 of which were associated with an outbreak. Nine were detected colonised on admission.
- MRSA was detected in 43 adult patients. Nine developed an MRSA infection and 34 patients were colonised. Thirty-nine were community-acquired MRSA, 2 were HCAI and 2 were of undetermined source.
- No patient was colonised or infected with carbapenemase-producing enterobacterales (CPE) from 1651 patient screens tested in 2021.
- There was no vancomycin-resistant Enterococcus (VRE) BSI. VRE was detected in 3 adult patients and no neonatal patients.
- In the neonatal unit, 5 infants were colonised with gentamicin resistant gram negative bacilli and 5 colonised with ESBL.

COVID-19
- 10,169 PCR tests for SARS CoV-2 were performed in NMH in 2021, of which 215 (2.1%) were positive. This compares to 2,541 SARS CoV-2 PCR tests performed in 2020, of which 72 were positive
- Sixty-eight (31.6%) positive results from NMH laboratory testing were adult patients, 3 (1.4%) neonates, 138 (64.2%) staff and 6 others.
- One HCAI patient infection occurred during 2021.
- Three staff outbreaks occurred in January 2021.

IPC Audits and Education
- Hand Hygiene
- 462 clinical staff (57%) received hand hygiene training.
- Hand hygiene audits results:
- Q1-2: 96% compliance with process. 8% non-compliance with a barrier to hand hygiene (e.g. wrist and hand jewellery, nails varnish).
- Q3-4: 98% compliance with process. 15% non-compliance with a barrier to hand hygiene.
- The HPSC have not been collating information on alcohol gel consumption, however internal monitoring of consumption has continued. Total alcohol gel use for 2021 was 2562.4L (2020 = 3465.58L; 2019 = 1892.88L).
- Compliance rate for Peripheral Vascular Catheter care bundle is 96% and for Urinary Catheter care bundle is 98%.
- Social distancing and PPE audits revealed compliance of 95.5% for NMH Staff, 95.2% for patients and 66.8% for partners.

Infection Control Midwives promoting Hand Hygiene Day!

- MRSA Audit: 80% of pregnant patients identified as a Healthcare Worker were screened for MRSA before delivery. 5.7% of them were positive for MRSA and 89% were decolonised before delivery.
- Chlamydia screening audit in antenatal women <25 years' old at booking: 182 women (31%) were tested, 8 women (4.3%) were positive, 163 Women (89%) were negative and 11 swabs were invalid.

Antimicrobial Stewardship

- Due to COVID-19, HSE reporting on hospital antimicrobial consumption for 2021 has not been completed. The consumption data for 2020 has now been reported in its entirety. Consumption for 2020 was 29.8DDD/100BDU which was down from a figure of 33.2DDD/100BDU in 2019. This is an overall reduction of 10% from 2019 to 2020. Data for this period showed a 16% decrease in use of IV Co-Amoxiclav. This could be due to COVID-19 and decreased infections and also reduced admissions for gynaecological patients in 2020.
- Antimicrobial app for adults and neonates has been updated on an ad hoc basis, based on changes in national and international recommendations.
- Prevalence survey 2021: 18% prevalence of antimicrobial prescribing, which represents an increase from 14% in 2020. Data was collected on a Tuesday in 2021, compared to Monday in 2020 and showed an increase in elective procedures on a Tuesday compared to Monday. Going forwards the audit will not be conducted on a Monday to avoid bias in data collection. Compliance with guidelines was 93%. Compliance with documentation of indication and allergy status was 100%.

Achievements

- On-going contribution to management of Covid -19 including alpha, delta and omicron waves.
- COVID-19 vaccination for staff and patients commenced 7th January 2021; booster doses commenced in November.
- The vaccination programme at NMH was presented at the Research and Innovation Symposium Exhibition in December 2021 and was awarded third prize in the innovation category.
- An infection control eLearning programme designed by the three Dublin maternity hospitals for midwives and nurses is now available on the HSE Land website.
- Commencement of operative vaginal delivery antibiotic prophylaxis.
- Commencement of 10 automated machines for high level disinfection of semi-critical ultrasound probes using hydrogen peroxide (Trophon®).
- Infection control monitoring during internal building works including works in operating theatres.
- New autoclaves installed in the central decontamination unit.

Service Development Plans for 2022

- Replacement Infection Prevention & Control Manager to commence in January 2022.
- A Microbiology specialist registrar post for NMH/ RVEEH is to be assessed by the Royal College of Physicians of Ireland training body in January 2022. If successful, this new post will commence in July 2022.
- Antimicrobial drug focus newsletter to commence.
- Update sepsis guideline and continue education and training.

Haemovigilance

The main aim of Haemovigilance is to promote safe transfusion practice in our hospital. The haemovigilance service participates within the overall Laboratory Quality Management system. It undergoes annual inspection and is accredited by the Irish National Accreditation Board.

Successes and Achievements

• INAB Accreditation achieved – ISO 15189
• 100% Traceability of blood components and products as required by European Blood Directive 2002/98/EC The Directive governs the activities of Blood Transfusion Service and Hospital Blood Banks *(Blood Transfusion Dept. and Haemovigilance Dept.)* in all EU member states: 3*(non-mandatory)* reports were sent to National Haemovigilance Office in 2021
Haemovigilance Education review in light of the continuing COVID-19 Pandemic was undertaken.
- Use of on line E-Learning system "Totara" for NCHD Induction was introduced in 2020 and continued in 2021
- Use of Blood Transfusion E-Learning *(learnpronhs/uk)* system was continued for Midwifery/Nursing staff and also for Midwifery Students
- No change to method of delivery of Haemovigilance education to other staff groups (MCA/Portering staff)

In 2021 a lot of time and work went into expanding the Haemovigilance Education presentation in Totara to cater for the Nursing/Midwifery Staff involved in the transfusion process with the help and guidance of Prof Grainne Flannelly for implementation in 2022

Plans for 2022

- Various policies to be reviewed/written and updated
- Maintain current Haemovigilance service
- To maintain ISO15189 (INAB Accreditation)
- To participate in the National Transfusion Advisory Committee (NTAG) working groups (Patient Blood Management, Life threatening Haemorrhage, Neonatal Components, Regional Transfusion Committees)
- To promote the appropriate use of blood and blood products and implement the new NTAG guidelines as they become available
- Continue to monitor transfusion practice
- Continue to monitort mandatory Haemovigilance education compliance

Father's Day at the NMH!

Clinical Nutrition and Dietetics

Roisin Gowan, Dietitian.

The Department of Clinical Nutrition and Dietetics provides a dietetic service for Maternity including diabetes in pregnancy, Gynaecology and Neonatology services with dietitians working as integral members of the respective multidisciplinary teams. 2021 saw many changes and demands on our service. We continued to adapt to the restrictions under the COVID-19 pandemic but welcomed a greater return to face-to-face activity resulting in a more blended service delivery combining both in person and telehealth clinics and classes in our effort to meet demands as safely and efficiently as possible. From a patient perspective, we observed that the apparent preference for telehealth noted initially during the pandemic reduced over time, with a decline in engagement for virtual classes in particular.

We also experienced the cyber-attack on the HSE which had a significant impact on our service, but again everyone rose to the challenge and the resilience and flexibility of staff must be acknowledged. 2021 brought staff changes too. We bade farewell to Hilary Devine and Eileen O'Brien and welcomed Rachel Sheane, Angela McCarthy and Sarah-Louise Killeen to fill vacancies as the year progressed. We also saw an expansion of the neonatal team as we welcomed Eimear Ryan for a new half-time senior post and later Catherine Shortall on a temporary half-time basis for project work. We facilitated an extended clinical placement of an MSc dietitian student from September to November, with support from the entire team.

The temporary appointment of a dietitian assistant helped to reconcile records affected by the cyber-attack, and contributed to project work and audit. Innovation, digital transformation, sharing of expertise, continuous professional development and student training, with patient care always at the core, continue to be an important feature of this department. Despite unprecedented challenges, the team worked hard and in new ways to continue to provide high quality nutritional care to women and babies attending the Hospital and to support our colleagues and other services.

Maternity, Diabetes, Gynaecology

The service for women with gestational diabetes (GDM) remains in high demand. An increased proportion of women attending the NMH in 2021 developed GDM. The dietitians along with a multidisciplinary team for diabetes care, work closely with their specialist midwifery colleagues to deliver the new weekly virtual clinic using the 'Attend Anywhere' platform for video consultations. Dietitians accept referrals in real time and women with poorly controlled GDM are seen immediately in the clinic for dietary assessment, facilitating speedy decision making about treatment. There was also a notable increase in the numbers of women with pre-gestational diabetes, and an associated complexity of care due to the increased use of insulin pumps (CSII) and wearable glucose monitors (CGM). This use of technology is welcome and allows for more individualised care for women with diabetes, while requiring a state-of-the-art skill set from the diabetes dietitians and a significant increase in the time needed per patient. Data is presented as part of the diabetes team report.

Management of nutrition and hydration and support for women with hyperemesis by the maternity dietitians was demanding in 2021. The model of care established on the day ward is being evaluated in a funded research project, and innovative practices led by NMH dietitians are now part of routine care e.g. use of PUQE score for evaluation of emesis, assessment of hydration using urine specific gravity. In 2021, service for women with gastrointestinal issues such as inflammatory bowel disease (IBD) and bariatric surgery was prioritised, and a specialist clinic led by a Senior Dietitian has been successfully established. Young mothers continue to be seen in the 'Daisy Clinic', and

while the 'Nourish and Nurture' support program, run in conjunction with Medical Social Work colleagues, suffered from pandemic restrictions and difficulty with online engagement, a package of education has been developed for teenagers with the support of the Linen Guild and will be launched in 2022. Antenatal classes continue to be delivered virtually, with a notable reduction in attendance for some groups as the year progressed. Optimising a blend between virtual and face-to-face classes will be a focus in 2022. Gynaecology services resumed, and the Adolescent Clinic is now delivered weekly as a virtual clinic, which evaluates well with both teenagers and their parents.

Clinical Activity

Data on activity for 2021 was affected by the cyber-attack, changes in personnel and how the service is delivered. Consequently, the usually reported metrics are not available at this time, but relevant service evaluations and audits will be available separately and 2021 figures will be added next year.

Neonatology

The caseload continues to be dominated by babies born very preterm or very low birth weight (VLBW) and others with feeding or growth issues admitted to the Neonatal Unit. While numbers remain fairly consistent, patient complexity and nutritional challenges continue to rise. We were delighted therefore, to welcome a new part-time post during the year which allowed us to help address the demand for dietetic input for babies in Hospital and post discharge home. The dietitian-led class for parents of babies post discharge from the Neonatal Unit was suspended during the year following a reduction in attendance. This had been popular when first introduced as a face-to-face class in 2020, but may have suffered from online fatigue and will be reviewed in 2022.

Efforts to optimise maternal milk provision and breastfeeding continued and we revised our enteral feeding guideline to expand the cohort of babies to receive breast milk only feeds (i.e. no formula milk feeds) to all <32 weeks' gestation or <1.5 kg (previously <28 weeks or <1 kg). We were pleased to see a further positive impact: in our audit of babies born very preterm or VLBW, amongst the cohort of inborn babies who received feeds (n=119), the number who received maternal milk remained high at 99% and the number who received exclusive maternal milk increased to 72% (47% in 2020); and amongst those who received oral feeds (n=63), the number who breastfed increased to 68% (58% in 2020). These improvements are thanks to multidisciplinary support and of course the effort of mothers and their families. Further details from this audit and outcome data from our initiatives to optimise nutrition and growth amongst babies in the Neonatal Unit are included in the Annual Neonatal Report published later in the year.

The team also contributed to the transformation of the 'Babies in Neonatal Care' parent booklet into an online microsite, nmhnicu.ie, launched on World Prematurity Day. This resource is accessible for parents and staff at NMH and beyond and again reflects an enormous multidisciplinary effort. We also contributed to the national implementation of a new model of care for standardised parenteral nutrition (SPN) for preterm babies. The project was funded by the National Women and Infants Implementation Programme (NWIHP) and involved the roll out of optimised SPN solutions and a protocol to all neonatal units throughout the country. This had previously been introduced at NMH in 2018 and has resulted in a significant reduction in the use of individualised PN and its associated risks and costs, which can now be appreciated at a national level.

The neonatal multidisciplinary team also welcomed a new Speech and Language Therapist for the first time in November and we look forward to working together and benefiting from her expertise.

New Developments and Quality Improvement Initiatives

- The launch of the Hollestic app for nutrition in pregnancy was a significant event in 2021. The app was developed based on research conducted at UCD Perinatal, and dietitian Dr Eileen O'Brien completed the development work with a successful January 2021 launch.
- The 'Iris Clinic' for management of hyperemesis was launched on the Day Ward
- 'Babies in Neonatal Care' handbook was transformed into an online microsite, nmhnicu.
- The multi-disciplinary initiative to optimise maternal milk and breastfeeding amongst babies born preterm in the neonatal unit, PRIME (PReterm Infants need Milk Early) and PRIME-B (Breastfeeding) were relaunched during National Breastfeeding Week coinciding with education sessions which were well attended by staff across the hospital.

Other Activities

- Education including contribution to the BSc Midwifery (UCD), MSc Nutrition & Dietetics (UCD), Post-graduate Diploma Neonatal Nursing RCSI), public health nurse training at NMH.

- Contribution to professional groups including the Diabetes Interest Group (INDI), Neonatal Dietitians Ireland Group, Maternity Dietitians Ireland and Knutston Ireland Diabetes Counselling Course.
- Representation on national groups including the HSE Neonatal and Paediatric Parenteral Nutrition Advisory Group, the HSE Baby Friendly Initiative Standards Group, the National Clinical Program for Diabetes and the National Women and Infants Health Program.
- Contribution to Hospital committees including the Nutrition and Hydration Committee, Healthy Ireland Group and the newly formed Infant Feeding Steering Committee. Our administrator coordinates health promotion campaigns for the NMH Healthy Ireland program.
- Contribution to the Hospital Telehealth Group and the NMH eLearning Hub Development Group.

Maternity Services, Diabetes in Pregnancy and Gynaecology Services

Maternity Services	2015*	2016**	2017**	2018	2019	2020
Inpatient & Day Case (all)	213	284	320	212	481	948
(Day Case)	-	-	-	-	(246)	(334)
Outpatients	137	240	260	250	371	108
Telehealth	-	-	-	-	292	900
Classes & groups	-	-	660	577	765	557ǂ
Gynaecology					(60)	n/a
Total	**350**	**524**	**1,240**	**1039**	**1969**	**2139**

ǂIn person classes Jan- March. E-learning hub available on www.nmh.ie. Early Pregnancy Class reinstated via live webinar from July.

Diabetes Service	2015*	2016**	2017**	2018	2019	2020
One to one (new & review)	484	935	793	713	802	507
Telehealth	-	-	-	-	254	921
2139 GDM Group (new)	284	219	466	436	462	524ǂǂ
Total	**768**	**1154**	**1229**	**1149**	**1518**	**1952**

Overall Activity	1118	1678	2469	2188	3487	4091

*ǂǂvia live webinar from March *1 WTE **2.69 WTE 3.5 WTE*

Neonatal activity	2016	2017	2018	2019	2020	2021
Total first time admissions to neonatal unit - based on year of admissiona	1830	2029	1424	1579	1183	1178
Babies with birth weight ≤1.5 kg or ≤31/40 weeks gestation - based on year of birthb	155	180	160	140	152	148
Inpatients seen by dietitian – unique patientsc	n/a	n/a	n/a	n/a	256	??
Outpatient dietitian contacts[d]	**326**	**230**	**171**	**n/a**	**199**	**410**

Neonatology Activity

[a]Neonatal Information System (NIS) data pre 2018; and Maternal and Newborn Clinical Management System (MNCMS) data from 2018.

[b]Dietetic data – each unique patient involves multiple dietitian contacts throughout their stay.

[c]MN-CMS data – each unique patient involves multiple dietitian contacts throughout their stay.

[d]Dietitian data for the years pre 2020 and Integrated Patient Management System (iPMS) data from 2020. There have been challenges ensuring accuracy and so data was omitted for 2019 and should be interpreted with this in mind for 2020-2021. We are working to ensure the reliability of future data.

Clinical Engineering

The Department of Clinical Engineering continue to provide a designated, coordinated approach to the management of Medical Devices and Equipment (MDE) throughout the NMH and to advise the Executive Management Team (EMT) on all matters related to the standardised coordinated management of MDE within the NMH. The department's objective is to ensure a safe, high quality service for its service users to enable better outcomes for patients.

2021 saw further Hospital and HSE investment in MDE with the procurement of 374 new and replacement medical devices, bringing the total number of in-service devices to 2809. This was a combination of the hospitals equipment replacement program, expansion of services and emergency replacement of irreparable MDEs. The department continued to maintaining its high level of in-house preventative maintenance with 74% of MDE maintained internally. The department's integration with HSE guidelines and policies with respect to MDE continues, as the national implementation of the Medical Devices / Equipment Management Policy is rolled out including the anticipated introduction of the new Medical Device Regulations.
With the ongoing infrastructural projects of the Hospital on its current site, and its proposed relocation to St Vincents University Hospital, Clinical Engineering participated on several committees providing advice on all aspects on the management of MDE including risk assessment and cost effectiveness. Some projects include the standardisation of all hospital vital signs monitors, the expansion of outpatient hysteroscopy services and the implementation of the national drug library on all hospital infusion devices. Other committees and projects that required departmental involvement include the National Maternal-Neonatal Newborn Clinical Management System (MN-CMS), the implementation of the NMH Strategic Plan and participation in the development of HSE National Tendering Frameworks such as electro-surgical units & neonatal infant warming systems. The department also represents the Hospital on several external committees such as the BEAI (Biomedical / Clinical Engineering Association of Ireland) and the Health and Social Care Professions Expert Group and has continued its close working relationship with the National Neonatal Transport Program.

Department members continue to keep up to date professionally in order to maintain an appropriate level of competence by participating in many internal and external lectures / presentations and by furthering their academic qualifications in order to up skill due to the rapidly evolving nature of medical technology and the ever increasing risks in cyber security. 2021 saw the departure of Mr Dara Keeley from the department to take up a new role and the introduction of Mr. Oleg Shrolik to the department.

I would like to take this opportunity to thank Mr. Dara Keeley, Mr Vasanth Pillai, Ms Maighread Gallagher and Mr. Oleg Shrolik for their ongoing commitment and dedication to the NMH and its service users.

2021 saw further Hospital and HSE investment in MDE with the procurement of 374 new and replacement medical devices, bringing the total number of in-service devices to 2809.

Bernadette Ryan, Senior Radiographer with the new digital mobile X-Ray machine that is managed and maintained by the Clinical Engineering Department.

Medical Social Work

Some of the Medical Social Workers promoting Domestic Violence Awareness.

The Medical Social Work Department began 2021 with 203 active social work cases and received a further 743 referrals throughout the year. Total workload for 2021 = 946 cases.

Greater Accessibility

Our Department is unique in being the only Medical Social Work Department (MSW) in the country currently offering a MSW service to patients twelve hours a day, six days a week. This makes our service much more accessible for patients and means our service is available to support Hospital staff in dealing with high risk situations that can arise outside of normal working hours.

Breakdown of Workload by Specialist Area

Neonatal Unit Admission	112
Fetal Anomaly Diagnosis	188
Domestic Violence	73
Addiction	45
Homelessness	36

The largest volume of referrals to the MSW continues to be for families with babies admitted to the Neonatal Unit and families with an antenatal diagnosis of a foetal anomaly. The Medical Social Worker completes a psychosocial assessment and offers intensive emotional support to these families.

Support to Maternity Units Ireland East Hospital Group (IEHG)

A MSW service was offered to 91 families who attended from maternity units within our IEHG, Wexford, Mullingar and Kilkenny. These Maternity Units continue to have no MSW service available within their hospitals. These referrals are mainly for parents whose babies are admitted to the Neonatal Unit and to families who receive an antenatal diagnosis of a fetal anomaly. They often require not only intensive emotional support but also significant practical support when travelling from a long distance for hospital care.

High Risk Caseloads

The MSW Department offers a specialist service to women experiencing domestic violence in pregnancy. In 2021, 73 women and their children were supported by this service. 12 of these families experienced homelessness as a direct result of their experience of domestic violence. The MSW supported 8 families in accessing refuge accommodation. 16 of these families were already known to Tusla due to the level of risk to their children. And the Medical Social Worker made 27 new referrals to Tusla due to child protection concerns. Gardaí were actively involved in supporting 33 of these families in relation to their experiences of violence. In 2021 the hospital began working in partnership with the Women's Aid Maternity Project and this enhances the support already being offered to women attending the hospital. Together we launched an excellent campaign for 16 Days of Action focusing specifically on Domestic Violence in Pregnancy.

The MSW Department offers a specialist service for women with addiction and in 2021 45 women were supported by this service. Due to the level of risk 17 of these families were referred to Tusla. Women received intensive support and as a result most babies were discharged home with their parents with a robust safety plan in place. Two babies were placed in alternative care.

Inclusion Health

In August 2021 our Department began offering a specialist service to women presenting as homeless. This is a new initiative in the three Dublin Maternity Hospitals and has been developed in recognition of the impact of homelessness and inadequate housing on children's health. The aim is deliver an integrated health care approach to homeless pregnant women. From September – December 36 women accessed this service in our Department.

Pharmacy

Louise Delany, Antimicrobial Pharmacist.

The overall aim of the Pharmacy Department is to ensure safe, effective and economical use of medicines and to support education, training and research in NMH. The department purchases, supplies and dispenses medicines for inpatient and outpatient use. The department consists of pharmacists, as well as pharmacy technicians and an intern pharmacist, who work together to ensure patients receive the highest quality pharmaceutical care possible.

Pharmacists provide a clinical pharmacy service for the NICU, antenatal and gynaecology wards, Maternal Medicines Clinic and antimicrobial stewardship, to ensure safe and effective use of medications. This is achieved through review of patients' charts using the Maternity Newborn Clinical Management System (MN-CMS) along with the performance of medication history checks and reconciliation at ward level.

Pharmacists play a central role in the continuing development and optimization of the electronic prescribing module of the MN-CMS, devoting a significant amount of resources to the provision of induction and ongoing training for clinical staff. The Chief Pharmacist plays a central role in providing the Drugs and Therapeutics Committee with up to date information on drug expenditure, new products, and medication policies, procedures, protocols and guidelines, while notifying the committee of cost implications associated with changes in clinical practice. The Chief Pharmacist is also a member of the Research Ethics Committee. The NMH medication safety programme is led by a Senior Pharmacist who chairs the multidisciplinary medication safety committee. This committee is responsible for developing and implementing a 5-year strategy, along with an annual workplan. Activities include dissemination of medication safety newsletters and alerts, performance of audits and quality improvement initiatives, along with an extensive programme of induction and ongoing training for all clinicians. Senior pharmacists are members of multi-displinary teams for the Maternal Medicines Clinic, NICU and Infection Control.

Pharmacy Activity

The Pharmacy Team continue to adapt to meet the unprecedented demands due to the COVID-19 pandemic whilst maintaining essential services for staff and patients. Pharmacy played an essential role in the delivery of the COVID-19 vaccination programme

throughout the year, setting up a reconstitution station in the NMH vaccination clinic to ensure large quantities of vaccines were administered to staff in an efficient manner while maintaining high standards of medication safety and infection control. Along with NMH midwifery/nursing and medical colleagues, the pharmacy team were redeployed to assist in the rollout of the vaccination programme to residential care facilities in Q1.

The Chief Pharmacist was redeployed to the Aviva Mass Vaccination Centre (MVC) from April to June to act as Pharmacy Lead during the height of the national vaccination programme. NMH Pharmacy continued to provide support for the Aviva MVC until September when it was stood down. The department said farewell to Anne Clohessy, Senior Pharmacist in the Maternal Medicines Clinic who left in August and welcomed Rosie Kirwan, Senior Pharmaceutical Technician to the team. The department took on its first 5th year undergraduate Pharmacy Student Máirín Hayes who successfully completed her experiential learning placement and was added to the register of pharmacists in November.

In 2019, the Pharmacy Department moved premises from the ground floor to 4th floor corridor beside the staff canteen. As anticipated, this move resulted in an increase in the proportion of dispensing for staff and outpatient prescriptions. Pharmacy performed clinical review of patient charts 15,134 times in 2021, performing activities in 22% of these reviews. This level of clinical pharmacy activity was maintained despite ongoing staff shortages and commitments to The NMH and national vaccination COVID-19 vaccination programmes.

Drugs and Therapeutics / Medication Safety Committees

Medication Safety

Where possible and taking into consideration the demands placed on NMH by the COVID-19 pandemic, the medication safety programme continued to implement the 5-year (2019-2023) medication safety strategy through use of the annual workplan.

Four medication safety or medication-related audits were conducted in 2021:

- Point Prevalence Survey of Antimicrobial Prescribing – September
- Institute for Safe Medication Practices (ISMP) Medication Safety Self-Assessment for Peri-operative Settings – October
- Retrospective review of antimicrobial out-patient prescriptions issued on MN-CMS in 2019 from Casualty Department - October
- Ordering and Administration of Medications for 1st Trimester Miscarriage on MN-CMS - December

Medication safety training sessions held: 24 for medical staff, and 2 for midwifery/nursing.

Quality improvement initiatives performed included: NMH COVID-19 Staff Vaccination Programme, Eclampsia Awareness Week, Resuscitation Trolleys Review, Pharmacy Medication Top-Up for Gynaecology Ward, Patient Information Leaflets for Fosfomycin and Linezolid, Optimising Medication Safety in Theatre, "L is for Lipid" Safety Bundle in NICU

Medication policies, procedures, protocols, guidelines: 10 new were approved, 23 were updated

Antimicrobial Stewardship

- Antimicrobial consumption figures for 2021 were not available at the time of writing. For 2020 overall consumption was 29.8 DDD/100 BDU, a 16% decrease of the index value since 2019 and the lowest figure since 2012. This decreased inpatient antimicrobial consumption was as a result of the COVID-19 pandemic which saw reductions in surgeries performed, with associated decrease in use of antibiotics for surgical prophylaxis, and reductions in length of stay for many patients which translated into less antimicrobials being administered to inpatients and more being issued to patients as discharge prescriptions
- Prevalence of antimicrobial prescribing during national Point Prevalence Survey was 18%, in line with average antimicrobial consumption in recent years
- 17 patients prescribed carbapenems, 88% in line with guidelines or received Microbiology approval

Medication Incident Reporting

Online medication incident reporting became live in all areas in 2021 hosted through a secure cloud-based programme. This system superseded the paper-based report form, allowing for greatly enhanced analysis of incident reports and trends. 214 medication incident reports were submitted in 2021 compared to 442 in 2020.

The high number of reports in 2020 was attributed to changes in clinical pharmacy workflow caused by the COVID-19 pandemic, whereby more time was available for pharmacists to identify and report incidents due to temporary cessation of medication history taking at ward level. In addition, the changeover from paper to electronic based reporting may have contributed to a reduction in reports received.

The majority of reports in 2021 came from clinical pharmacy review of patients' charts (59%), followed by midwifery / nursing (38%) and medical (2%). The proportion of incident reports defined as "near miss" increased from 5% in 2020 to 11% in 2021 reflecting a heightened awareness of the importance of learning from near misses.

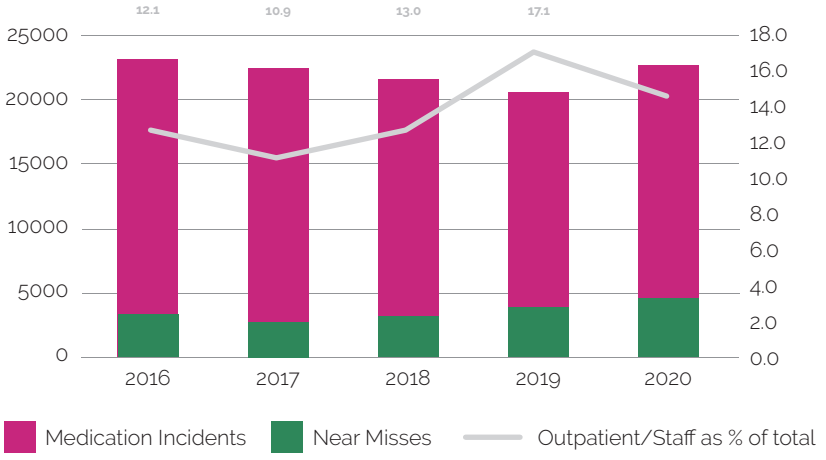
The reporting of incidents is of value as the data collected can be analysed to identify trends or patterns in relation to risk, and resulting recommendations for improvement can be shared with frontline staff.

Analysis of incident reports found that:

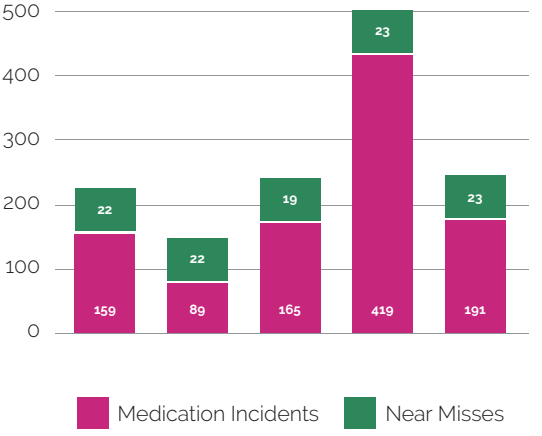
- Incidents most commonly occurred at the point of prescribing (45%) followed by administration (43%), and medicines reconciliation (12%)
- 'Dose incorrect / unclear' was by the most common primary reason 21%, followed by 'Administration not recorded' at 18% and 'Administration omitted' at 14%
- Antimicrobials as a group were the medications involved in the highest percentage of reports (15%), followed by Diclofenac (14%), Tinzaparin (12%), Home Medications (10%), and Dinoprostone (8%)

This analysis of trends will be used to inform areas for targeted improvement.

Maternity Services, Diabetes in Pregnancy and Gynaecology Services



Medication incidents



Clinical Pharmacy Activity	ANW 1	Gynae	PNW 1	PNW 2	PNW 3	Maternal Medicine Clinic	NICU	Antimicrobial Stewardship	Total
Clinical Pharmacy Reviews Performed	2738	414	387	456	2829	880	5504	1926	**15134**
Pharmacy review Activities	879	149	86	114	481	264	711	595	**3279**
Activity Rate per review (%)	27	29	24	22	15	22	11	33	**14**
	32	36	22	25	17	30	13	31	**22**

Clinical Pharmacy Reviews Performed	2018	2019	2020	2021
Number	15587	13548	21232	15134

Jo Egan, Physiotherapist.

Physiotherapy

The Physiotherapy Department had an increasingly busy year in 2021 with over 4,148 new patient referrals. This represents a 26% increase on our 2020 figure even with the absence of much of our May and June data as a result of the cyber-attack. This continues to reflect a pattern of increased demand for physiotherapy services observed with the introduction of MN-CMS. This demand drives the shape of our service leading to our increased provision of group classes to try and reach our service users in a timely way. 2021 commenced with us having a whole time equivalent of 7 WTE's.

During the year Ciara Ryan left for Maternity leave in March and Aoife Cullen returned in August with both leaves ably covered by Sarah Mullins. We continue to provide a half-time service to the Pelvic Floor Centre located in St. Michael's Hospital which is ably lead by Lesley-Anne Ross who was upgraded to a Clinical Specialist Post in 2021.

The Physiotherapy Team provide:

- A referral based Physiotherapy service to all inpatients Mon-Fri.
- An outpatient clinic offering appointments Mon-Fri for musculoskeletal conditions and issues relating to pelvic floor dysfunction.
- A neonatal service within the NICU and an outpatient service Mon-Fri.
- Ongoing contribution to the delivery of the hospital antenatal and postnatal education programmes
- A range of education sessions to facilitate early assessment and timely access to physiotherapy services e.g. Pelvic Girdle Pain Class, Pelvic Floor Care Class, Little Feet, Big Steps Class & Healthy Bodies after Birth Class
- A service to the multidisciplinary Pelvic Floor Centre team based in St. Michael's Hospital every Monday and Wednesday.

The commencement of 2021 saw staff receiving vaccines in the NMH and while we were awaiting them to take effect, we operated a primary telehealth service for outpatients up until the second week of February. After that the service ran face-to-face for the remainder of 2021

There were a total of 4,148 new referrals in 2021. We continue to initiate all referrals with a telehealth assessment to complete all subjective information gathering and dissemination of first line advice and guidance having a library of NMH resources at our disposal. Department activity is reviewed under 3 headings: Obstetrics, Gynaecology and Neonatology. Patients are seen either as inpatients, on the obstetric (pre and postnatal), gynaecology or neonatal units, or as outpatients in the Physiotherapy Department. Some patients may require just one visit; others may require a number of treatment sessions. Our Physiotherapy Department is located on the 2nd floor of 65 Mount St.

Physiotherapy in Obstetrics: Obstetric Assessment and Treatment

We offer outpatient physiotherapy to all of obstetric patients as well as providing an inpatient physiotherapy service. We treat a range of musculoskeletal and pelvic floor conditions across the childbearing year. Data is sourced from MN-CMS. As can be seen in the above chart, the bulk of our obstetric patients are referred with back and or pelvic pain. In order to facilitate reaching these patients in as timely a way as possible we run virtual Back & Pelvic Care classes every Thursday from 11-12 noon. We also commenced a weekly virtual postnatal class every Friday from

11-12.30pm entitled 'Health Bodies After Birth Class' to reach our postnatal Mums.

Physiotherapy in Gynaecology

We run an outpatient gynaecology physiotherapy clinic treating patients with pelvic floor dysfunction. We also review those inpatients admitted for major gynae surgery. In 2021 we continued to have a 2 day out posting of staff to the Pelvic Floor Centre in St Michaels Hospital. We commenced a Pelvic Health Class as a first-line for all triaged referrals to the Urogynae clinic to improve our timely reach to women referred to this service.

Physiotherapy in Neonates

2021 saw an ability for our Clinical Specialist Joanne Egan to spend more time working within the NICU as we recruited a Senior Neonatal Physiotherapist Eithne Lennon to assist with the neonatal outpatient caseload. We hope to make that a permanent post in 2022 as it is crucial to the delivery of the service.

Obstetric New Patients

Reasons for Consult	2021 (n=2948)	2021 %	2020 (n= 2633)
Pelvic Girdle Pain	1288	44%	1146
Other	713	24%	569
Urinary Incontinence	228	8%	245
DRAM	215	7%	191
Coccyx pain	104	4%	107
OASIS	85	3%	105
Carpal tunnel syndrome	133	5%	95
Respiratory	8	0%	13
Pelvic floor pain/dyspareunia	26	1%	55
Urinary Urgency	29	1%	26
Pelvic Organ Prolapse	41	1%	28
Faecal Incontinence	28	1%	16
C-section complications	12	0.5%	7
Thoracic/rib pain	23	0.5%	13
Faecal Urgency	6	0%	6
Urinary Retention	9	0%	11

Gynaecology New Patients

Reasons for Consult	2021	2021 %	2020 (n= 2633)
Bladder & Bowel Dysfunction	218	38%	101
Prolapse	46	8%	27
Routine Post Op Advice	123	22%	24
Pelvic Pain/Dyspareunia	25	4%	17
Mobility Assessment	2	0.5%	4
Respiratory Assessment	2	0.5%	4
Previous OASIS	6	1%	0
Pelvic Floor Centre	148	26%	101
Pelvic Floor Centre	148	26%	101

Neonatal New Patients

Reasons for Consult	2021 (n= 632)	2021 %	2020
Neurodevelopmental	282	45%	302
Talipes	156	25%	79
Brachial Plexus Injury	26	4%	18
Upper limb fractures	9	1%	5
Developmental Dysplasia of Hip – requiring Pavlik harness	33	5%	21
Other	82	13%	34
Head & neck Assessment	44	7%	101

Psychosexual Therapy

A blended approach to counselling work was carried out during 2021, offering clients the option to attend online or face-to-face in the clinic. Clients living further away as well as those with young children or those who are working, appreciated being able to attend sessions online and it is envisaged that this approach will continue to be offered in the future.

Vaginismus continues to be the main problem presenting to the clinic and clients are seen from ages eighteen years to sixty-five years plus who are dealing with the difficulty. Due to the complexity of the problem and the length of time clients are engaged in the work, combined with the large increase in referrals, there remains a lengthy waiting list to be seen.

The National Maternity Hospital is one of very few providers countrywide that offers a service to public outpatients. Noticeably, there was an increase in the amount of clients referred from external sources including hospitals such St Luke's, St. James, the Mater, the Rotunda, St. Vincent's University Hospital, St. Columcille's Hospital, Loughlinstown, Our Lady of Lourdes Hospital Drogheda, St Michael's Dun Laoghaire and Louth County Hospital, Dundalk.

There was also a noticeable increase in clients being referred post cancer treatment. Side effects of cancer treatment may cause sexual dysfunction. Dryness may result from chemotherapy treatment. Radiation therapy may cause vaginal stenosis and penetration may be sore or not possible. Surgery may shorten the vagina thus causing pain with deep penetration. It may bring on premature menopause if the ovaries are removed. Fatigue and a change in body image may affect desire. Often clients are referred if and when a sexual dysfunction is revealed.

However due to there being a high percentage of relationship breakdown post cancer treatment there is ideally a need for patients to be given information as soon as possible post treatment. Psychosexual counselling focuses on clients identifying what sexual activities are still possible and encouraging them to make adjustments to remain intimate.

Lectures to Medical Students resumed in 2021 and the Department was involved in a Study Day for GPs delivered online. 150 new referrals were received in 2021; 43 referrals came from a waiting list from 2020 and 9 cases continued therapy from 2020.

Dysfunctions presenting in 2021

Female		
Vaginismus	98	70
Dyspareunia	42	16
Inhibited Sexual Desire	26	17
Anorgasmia	8	4
Male		
Erectile Dysfunction	8	9
Delayed Ejaculation	2	
Unconfirmed	18	16
Total		**202**

Referral Sources		
Consultant/NMH Staff	98	67
General Practitioners	52	35
Other Agencies/Hospitals	42	30
Self Enquiries	10	132
Total	**202**	

Outcome	
Engaged in weekly/fortnightly therapy or brief intervention	52
Cancelled or did not attend initial appointment	31
Placed on waiting list for 2022	75
Referred to private clinic	23
Referred to external/local PST services	21
Total	**202**

Radiology

Paediatrics

The Department of Paediatric Radiology was established in 1984 and has evolved over the years to provide a range of ultrasound and radiographic services to the hospital's paediatric patients.
Services Provided for Paediatric Patients
General radiographic examination on neonates admitted to the Neonatal Unit and for infants attending the outpatient clinics if required. The majority of this work is portable radiography.

- Fluoroscopic gastrointestinal contrast studies.
- Ultrasound and doppler service.
- Ultrasound examinations for developmental dysplasia of the hip.
- MR examinations for infants up to one year of age.
- Fetal and placental MR examinations in pregnant patients.
- CT examinations via The Children's University Hospital, Temple Street, D1.

The National Fetal MRI service is based in The National Maternity Hospital and accepted Fetal MRI referrals from the 6 hub hospitals of the Rotunda, Coombe, GUH, UHL and CUMH along with neonatal MRI referrals.

Services Provided for Adult Patients

- General radiographic examinations.
- Hysterosalpingograms and selective fluoroscopic examinations.
- Limited ultrasound service. Referrals are currently limited to patients referred by National Maternity Hospital consultants. The types of examinations are limited to upper abdominal examinations and transabdominal and transvaginal pelvic examinations. Emergency ultrasound (including doppler ultrasound) examinations are performed at St. Vincent's University Hospital
- Elective and emergency CT examinations via The Radiology Department, St. Vincent's University Hospital
- MR examinations via the Department of Radiology, St. Vincent's Private Hospital. Examinations include staging of cervical cancer and uterine cancer, MR characterization of ovarian masses and MR urography
- Interventional radiology procedures via the Department of Radiology, St. Vincent's University Hospital. Procedures include emergency nephrostomy and abscess drainage.

Clara Nolan, Clinical Specialist Radiographer.

A total of 8,327 examinations were performed in 2021. Adult services: 1,534 adult examinations were performed of these 292 examinations were hysterosalpingograms and 781 ultrasounds were performed. 461 other adult examinations were performed including x-rays and gynae MRI.
6,793 paediatric examinations were performed. 1,891 were hip ultrasound and 500 cranial ultrasounds were performed. 908 other examinations were performed including x-ray, fluoroscopy and other ultrasounds, (renal, abdominal, chest, soft tissue, vascular). 494 MRIs were performed of which 214 were fetal MRI examinations.

Compliance & Data Protection

Compliance

For the National Maternity Hospital, being a Section 38 hospital, the regulatory environment has increased over the last years. Annual compliance reporting is required both to our main funder, the HSE, as well as to the Charities Regulator among other authorities. Governance issues are essential elements for the Executive Committee (Board) of the Hospital. Together with staff members the sub-committees are following compliance and governance issues closely and reporting on a regular basis to the Executive Committee making sure that we are compliant with all relevant regulations.

This year we reported our compliance in relation to the Charities Regulator's Code of Governance for the first time. In addition, corporate governance procedures, including Board arrangements and responsibilities, are mapped against The Code of Practice for the Governance of State Bodies and The HSE Code of Governance. All members of the Executive Committee have also participated in refresher seminars on corporate governance issues.

In an Annual Compliance Statement, we furnish our compliance status to the HSE in areas such as governance, finance, procurement, risk management, taxation and remuneration. We also report our compliance with the provisions of the Service Level Agreement with the HSE (an extensive document covering services of the Hospital contracted to the HSE).

Carl Alfvag, Compliance and Operations Manager

Data Protection

The Data Protection Officer is responsible for implementing and maintaining a Data Protection Management System with a framework for ensuring that the Hospital meets its obligations under the General Data Protection Regulation (GDPR) and all associated legislation. We have a Data Protection Management System in place that is in compliance with GDPR and our staff are 'data privacy/GDPR' aware with knowledge and understanding of how it affects their day-to-day role as well as the need to ensure that data protection is considered in all our planning.

Subject Access Request (SAR)

An individual has the right to access any electronic or manual information that the NMH holds about them. The hospital will provide them with a copy of their personal data held by the hospital on request free of charge within 30 days from the date the request is made. A system is in place to ensure that all requests are actioned, quality checked and sent out within the 30 days' period allowed by the law. There has been an increase in the number of SARs received over recent years with over 50% of requests submitted by solicitors on behalf of their clients. During the year we responded to more than 1,100 SARs requests of which the majority were Administrative Requests (patients requesting information directly).

Training

Staff training is a crucial part of protecting data privacy and is required under Article 39 of the GDPR. Data protection training is mandatory for all staff (bi-annually). The data protection training is done online which is the measure put in place to help us comply with the law.

Breaches

Most of the internal data breaches reported are as a result of increased awareness of what constitutes data breaches and the various data protection courses available to staff. NMH staff are well aware of the need for transparency and the need to ensure due process in reporting and in dealing with data breaches. There is an internal online system to report data breaches to make it easy and transparent. Significant breaches are reported to the Data Protection Commission and reviewed and if need be, internal practices are improved to avoid future breaches.

Hospital Inpatient Enquiry

The Hospital Inpatient Enquiry (HIPE) system collects information on hospital day cases and inpatient activities in Ireland. The HIPE system and associated coding will determine the invoicing and future budget of the hospital.

In 2021 a total of 16,986 discharges. HIPE staff review the entire medical record contents and extract principal diagnosis and procedures. Medical classification codes are then assigned as per ICD-10-AM 10th Edition or Turbo Coder (e-book). A principal diagnosis and up to 29 additional diagnosis as well as a principle procedure and up to 19 additional procedures. These are then grouped into a DRG (Diagnostic Related Group) which categorises patients

"In 2021 a total of 16,986 discharges. HIPE staff review the entire medical record contents and extract principal diagnosis and procedures. Medical classification codes are then assigned as per ICD-10-AM 10th Edition or Turbo Coder (e-book)."

into groups based on clinical similarities and resource consumption. They are then exported monthly to the Healthcare Pricing Office with a strict 30 day deadline. The hospital budget will be set based on agreed/ commissioned Activity Based Funding target levels and monies will only be provided when activity is carried out and invoiced i.e. coded.

Nicole Jackson, Healthcare Assistant.

Human Resources

The Human Resources Department (HR) provide Human Resources corporate services across the Hospital for all staff. HR is also involved in a number of corporate initiatives across the Hospital. Caoimhe De Brun, Deputy HR Manager joined our very dedicated HR team in June 2021; Caoimhe brings a wealth of experience in Industrial Relations and HR policy and I wish her well in her new role. Edel Mulligan left the HR team during the year after many years of service to take up a HR Manager's post and we wish her every success in her new role.

COVID-19 Pandemic

HR continued to have a very challenging year in 2021 living with the COVID-19 pandemic. The HR Department's workload increased to support the Executive Management Team (EMT) and COVID-19 Taskforce communicating new policies, issuing guidelines from various bodies, recording COVID-19 absences on a daily basis and recruiting at short notice. HR continues to implement agile working within the department to conform with social distancing and safety recommendations. The positive impact of the pandemic was that staff adapted quickly and relocated to areas which had the greater need; various talents were identified and staff contributed to the ever changing conditions placed upon us by the pandemic. Staff showed great flexibility and collaboration.

Recruitment

COVID-19 triggered many changes in how the HR Department operates with a number of recruitment competitions now performed either remotely, via a hybrid model or face-to-face depending on national guidelines. The HR Department continue to implement the recruitment portal Rezoomo which was introduced in May 2020 to streamline and automate the recruitment process. In 2021, HR linked this to irishjobs.ie to improve its efficiency and provide centralised data.

NCHD Induction: Online NCHD's induction was developed further in 2021 to facilitate all new Doctors starting at the Hospital. This was well received and feedback was very positive. The HSE cyber-attack on IT systems in early 2021 limited the access of NCHD's requirements including Garda Vetting, Occupational Health, training evidence etc.

Workforce Planning: Accenture transferred the Workforce planning knowledge to the Hospital in May 2020 and HR continue to project this plan as required

by the EMT and in line with funding from NWHIP, IEHG to further implement the National Maternity Strategy 2016 to 2026. The recruitment continues in order to be ready for the future expansion of services and move to a new campus.

The National Maternity Hospital Strategy Goal 2: The HR Department is heavily involved in this goal which runs from 2019 to 2023: "*Being the Employer of Choice and recognising that our Staff are our Greatest Asset*".

Staff Retention Initiatives: Staff at the Hospital with 25 years' service are now awarded a once off 5 days' extra holidays as recognition of their dedication and loyal service to the Hospital.

HR Quarterly Report Updates: The HR Department provide a quarterly HR performance report to the Finance Committee. The highlights of the key Performance indicators for 2021 are as follows: -

Employment Assistance Programme (EAP): In 2021, the EAP service was utilised by 4.6% of staff. Also, 166 engagements and 133 staff have viewed the 'Live Well Sessions' that are distributed by email on a monthly basis.

Talent Retention: It is evident that the biggest challenges for HR professionals continues to be people related, recruiting new talent, retention of current employees and training and development. Monitoring and analysing employee turnover will help identify areas for improvement. HR take the lead in examining how best to enhance the Hospital Employee Value Proposition and ensure it is well communicated. During 2021, the NMH received approval for a number of development posts in areas such as Fetal MRI, Infertility Programme, Mesh, Colposcopy. The ongoing requirements of COVID-19 also saw an increase in staff in some areas to comply with National guidelines.

Absenteeism: The average absenteeism rate for the hospital in 2020 was 3.67%, but this was acerbated by COVID-19. This slightly decreased to 3.22% in 2021 with the roll out of the COVID-19 vaccine and the extreme vigilance of the Hospital staff. The HSE target for absenteeism in normal circumstances is 3.5%. Our overall sick leave figure continues to come in line with the HSE average, thanks to our dedicated staff and management.

Employee/Industrial Relations: Employee and

"It is evident that the biggest challenges for HR professionals continues to be people related, recruiting new talent, retention of current employees and training and development. Monitoring and analysing employee turnover will help identify areas for improvement."

Industrial relations are ongoing with Staff and Union Officials and most cases are resolved quickly, informally and without any further action required.

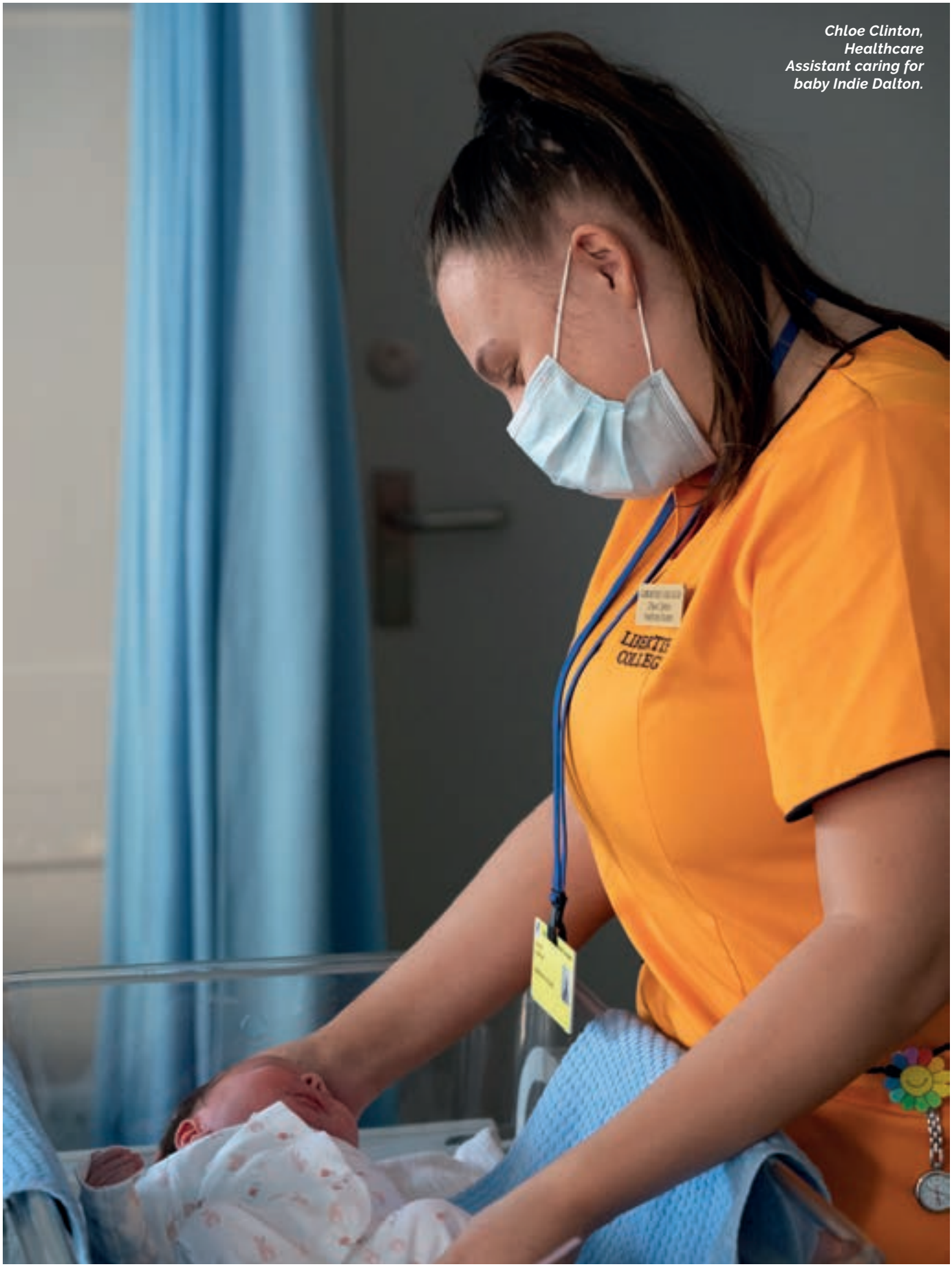
The 'Building Momentum' agreement introduced in 2021, had a positive effect on digitalisation, flexibility and the reversal of HRA pay reductions. The 'Right to Disconnect' code of practice was introduced in April 2021.

The National Maternity Hospital Information Agreement 5-year review took place in Quarter 3 of 2021. The Hospital engaged with all Staff and Union Officials on this agreement and have adjusted the agreement taking into account staff feedback.

Parent's Leave increased to 5 weeks in 2020/21 and will increase to 9 weeks by 2022. A Staff Satisfaction Survey was conducted in May 2021 and overall, there were very positive results. There were some areas identified for development and feedback and this took place in the last quarter of 2021.

Communications at the Hospital: A Communication Committee was established at the Hospital in 2020 and one output from this is a Newsletter that is produced on a monthly basis since May 2021. This is lead by Jennie Cotter who is doing a fabulous job on keeping the staff informed on a monthly basis on what is happening at the Hospital. The appointment of Jennie as Communications Officer a few years ago has made a significant difference to the profile of the Hospital both internally and externally. The newsletter and the introduction of the NMH Hospital App is a great aid to communicating on a regular basis with staff at the Hospital. HR have a representative on the Communication Committee and have close links with the Communication Officer (Jennie) in order to improve communications at the Hospital.

The Partnership committee continue to meet on a monthly basis with all stakeholders represented to promote communications and working together to



Chloe Clinton, Healthcare Assistant caring for baby Indie Dalton.

bring about change. The National Maternity Hospital continue to explore all avenues to inform and consult with our staff on a daily basis in conjunction with the Hospital Information & Consultation Agreement.

Training and E-Learning: All training was transferred on line in 2020 due to social distancing guidelines. Training is managed locally by the Head of Departments to ensure staff comply with the mandatory requirements. In 2021 a number of staff undertook online training in QQ1 Level 6 leadership on Train the Trainer and Project Management courses; this was an exciting opportunity for staff to learn new skills to develop professionally. The HR Department is involved in the development of the e-learning platform Totara and this development was finalised in 2021 with a working group of relevant stakeholders. This will need to be tweaked in accordance with needs of the Hospital in the first quarter of 2022 with a review of the governance structure around its management and training modules. Totara is jointly managed by HR and the Midwifery & Nursing Education Centre.

Challenges for 2021: In 2021 there continued to be a number of changes that the Hospital adapted to including family friendly policies, further flexible working, remote working, staff cocooning, vulnerable workers, staff with long COVID-19 and, supporting hospital re-configuration. Therefore, it is important to have a workforce planning group to put an action plan in place to address current recruitment and retention issues. The HR Department will introduce more agile forms of working and work on building a high performance team for the future. The HR Softworks system was upgraded in 2021. Further configuration and cleansing of data needs to take place in 2022 to produce the reports required. Staff in HR are using Rezoomo a recruitment platform to assist with shortlisting and we hope to expand this platform to add Equitas to record virtual interviews. However, HR prefer to meet candidates face-to-face where possible. The HR department rolled out a pilot format of Performance Achievement in late 2021, however there was not much uptake as there was a high shortage of staff in various areas (particularly in Midwifery & Nursing). The HR Department will contribute to developing training needs and staff engagement following the results of the staff satisfaction survey.

Pensions: The pension area has seen an increase in the number of staff retirements in 2021 compared to 2020 and this trend looks set to continue into 2022. Initially the COVID-19 pandemic had slowed down retirements as staff made a choice to continue working but this is now changing and staff are opting to retire.

Social Activities/Wellbeing: The Hospital Social committee keep in regular contact with staff who have retired at the Hospital through 'whatsapp' and they receive the newsletter on a monthly basis. Retired staff are invited to attend Schwartz rounds, the staff drive-in movie at Christmas and invited to contribute to the staff newsletter. The future plan is to set up an Alumni link to keep in touch with staff who have left the hospital and this will also be a useful link to recruit staff abroad in the future.

Due to COVID-19, social activities at the Hospital were very much curtailed. Wellbeing is a HR priority and we work with the Healthy Ireland committee to arranged talks on various topics. A number of online videos and supports were provided by IEHG, HSE and VHI to assist staff with topics such as Stress Management, coping with trauma/burnout, fitness and wellness.

Move to Crosscare: The HR team moved from the 4th floor of the Main Hospital to our new bright and airy location in 'Crosscare' on Holles Row in September 2021. With the aid of our Portering, Purchasing and Engineering team, this was managed with very little disturbance to our service.

It also gave us an opportunity to declutter many items which we no longer required. We'd like to thank all those who helped us along the way in achieving this.

As mentioned above, 24 members of staff retired in 2021 and each and every one of those staff will be missed by their colleagues and friends. The Hospital will also miss the expertise and knowledge these staff take with them. We wish all our former colleagues a long, health and happy retirement. A number of staff postponed their retirement plans or came back to work at the Hospital during COVID-19 and this was very much appreciated by the Hospital and their dedication is greatly acknowledged.

The following formerly retired staff passed away in 2021 Irene Buckley, Mary Lowry, Maria Martin & Patricia Murphy (RIP). They will all be remembered for their valuable contribution to the hospital and will be dearly missed by their colleagues and friends.

Information Technology

IT Department were runners-up at the annual Christmas competition for Best Dressed Department!

2021 started with 50 new 'HP ProDesk 400' PCs acquired in Nov 2020 being installed throughout the hospital to continue the ongoing PC refresh. Another 84 'HP ProDesk 400 PCs' were purchased in August 2021 and this has further reduced the number of 'Windows 7' PCs from 250 at the end of 2020 to 145 at the end of 2021. This acquisition of 84 PCs was funded by the HSE. This funding will also be available in 2022 and 2023.

A new Virtual Private Network (VPN) System was installed and commissioned in September 2021 and by the end of the year, 40 uses approximately have been moved over to this system. The old VPN System will be shut down by the end of Q1 2022. The number of laptops was increased from 175 to 190 during 2021.

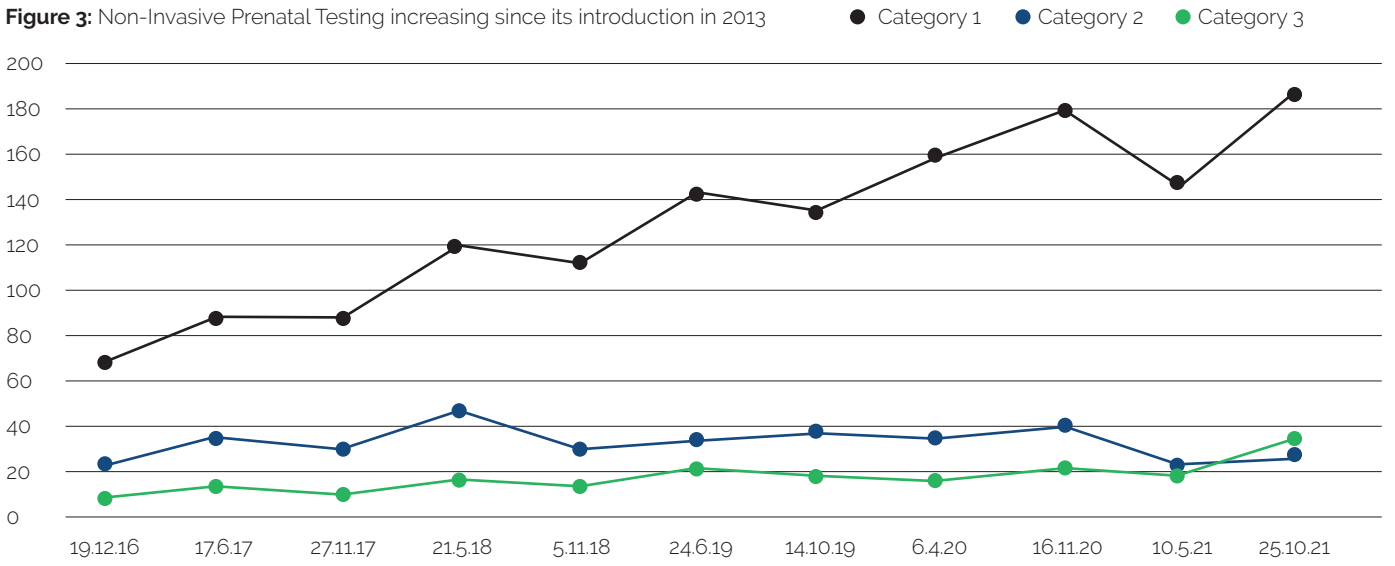
To keep pace with demand a further increase in the capacity of the main Storage Area Network (SAN) Equipment will be required in 2022.

The COVID-19 Pandemic continued to have an impact in terms of requests for laptops and Surface Pro tablets. These requests arose as a result of staff needing to work from home for a variety of COVID-19 related reasons.

The cyber-attack that occurred on 14th May 2021 had a major impact on the HSE and any hospital that accessed systems hosted in the HSE Data Centre, such as MN-CMS and iPMS. Thanks to the systems that the NMH have in place and the staff who continuously monitor them, no PCs, laptops or servers at NMH were compromised by the attack. These systems comprise three main elements which are -

1. Juniper Firewalls in conjunction with SKY ATP (Anti Threat Protection)
2. Cisco Ironport for email scanning and filtering.
3. McAfee Anti-Virus Server that continuously monitors and updates Windows 7 PCs; Windows 10 PCs use Microsoft Defender.

Figure 3: Non-Invasive Prenatal Testing increasing since its introduction in 2013



All systems that are hosted in our local NMH Computer Room continued to function. These systems included E-FIN Financial System, Mediscan in Colposcopy, Viewpoint in Fetal Medicine Unit, AGFA PACs in Radiology, Winpath in the Lab, QPulse and MS Exchange for internal email. In spite of the integrity of our on-site systems, at the request of HSE OCIO, NMH, along with other Voluntary Hospitals, disconnected all our external links.

By 1st June some access to MN-CMS and IPMS was available. The creation of duplicate accounts in the HealthIrl Directory allowed staff to start using MN-CMS although removing these extra accounts in the future will be onerous. Internet access was forbidden by the HSE from 14th May and was only restored gradually based on the priority of the user. By 22nd June full Internet access was restored.

In September 2021 the I.T. Department assisted HR Staff with their move to their new offices in the 'Crosscare' building. Also in September, I.T. Staff assisted with the setting up of new Telehealth Hub in the old HR Office on the 3rd Floor.

Audio visual equipment was upgraded in the Unit 9A Lecture Theatre in March 2021 as the demand for meeting and conferencing facilities increased dramatically since the start of the pandemic. The same company Premier AV completed a similar upgrade in the Main Lecture Theatre on the 1st Floor in 65/66 Mount Street.

A network upgrade has been commenced with initial focus on replacing the Cisco 4510 in the basement of 60 Mount Street. This switch had been problematic since December 2018.

The graph above shows the workload trends for the I.T. Dept since Dec 2016 based on the ITIL model.
Blue line represents Category 1 (break /fix) items.
Green line represents Category 2 (password reset) items.
Red line represents Category 3 (requests for assistance) items.

The impact created by the COVID-19 Pandemic can be seen at the 6th April 2020 whilst the high value for November 2020 was caused by problems with an IPMS Upgrade in September 2020 and problems with a Firewall Upgrade in November.

The drop in tickets logged at May 2021 came about after the cyber-attack and as a result of paper systems being introduced for several weeks.

The I.T. Department continued to work through the recommendations from the BDO security audit that was conducted in 2020. The cyber-attack did not impact NMH systems as reported above but some of the recommendations from BDO were expedited as a precaution. The upgrade of the VPN infrastructure was the main priority for 2021.

Meetings on the project for NMH co-location to the St. Vincent's University Hospital Campus were suspended at the time of the cyber-attack and did not restart until later in the year.

The vacant Grade VI Position was filled in July 2021 by Saju George who settled in well.

Information Management

In May 2021, we were extremely sad to hear of the death of former Information Officer, Róisín Moriarty. Róisín pioneered the role of Information Officer in 2001 and although she only remained in the Hospital for 5 years, she left her mark by establishing a strong role with some of her templates still in use even to this day! Róisín was always so bubbly and full of life with a bright smile; she taught me so much for which I will always be grateful and I will never forget her. May she rest in peace.

Information Management involves retrieving and managing data from one or more sources and arranging it in such a way as to make it relevant and meaningful. Health Information Management is an increasingly important and essential resource: Hospital data from various clinical and administrative systems is validated and analysed in order to produce meaningful reports that are essential both internally and externally to aid and support decision making, clinical audit, research publications, medical coding and billing.

The recording of clinical data in The NMH has increased substantially with the introduction of the electronic patient record on the national Maternal and Newborn Clinical Management System (MN-CMS). MN-CMS reporting revolutionised clinical data analytics in The NMH but continues to be a substantial challenge with the continued difficulties in developing and rolling out reports from the system. We continue to work with the national MN-CMS Team to maximise our use of reliable reporting from MN-CMS.

Improving information management practices is a key focus for many organisations across both public and private sectors and we are no exception. Generating interest in reporting and outcomes plays a significant role in improving practices and can provide motivation to ensure high quality data is recorded in order to return high quality reporting. However, it is not always simple: daily, weekly, monthly and annual validation checks undertaken on data across many systems takes time and requires the expertise of busy staff in particular the MN-CMS Team, Delivery Ward Manager, Clinic Supervisors and iPMS Administrators. Efforts become all the more worthwhile as the uses of high quality reporting are seen.
The Information Management Department consists of Information Officer, Fionnuala Byrne and Clinical Data Analyst, John Geoghegan who work closely with IT, Patient Services and Administrative Departments as well as Allied Health Professionals, Nursing & Midwifery and Medical Staff in the hospital. The prime responsibilities of the role are:

- Extracting and analysing information from hospital information systems to assist local management decisions and highlight changing/emerging trends across all departments.
- Organising Health Service Executive returns.
- Producing hospital activity reports for the Central Booking Committee, Clinical Governance Executive Committee, Executive Management Team, Finance Committee, Quality Risk and Safety Patient sub-committee of The Board as well as the Executive Committee (The Board).
- Coordinating the NMH Irish Maternity Indicator System (IMIS) returns.
- Publishing online the monthly Maternity Safety Statement.
- Coordinating the completion and submission of all eligible perinatal death notification forms to National Perinatal Epidemiological Centre (NPEC).
- Publishing the Hospital Annual Report and the Annual Neonatal Report.
- Submitting all eligible babies to the Vermont Oxford Network.
- Fulfilling ad-hoc, audit and research requests for staff and students.

Patient Services

Danielle Nolan, Patient Services Department.

The Patient Services Department is a source of information and channels patient queries in relation to Hospital services to the relevant areas. Service users' needs are constantly changing and we are determined to meet these challenges.

The Patient Services function aims to support the Hospital's care systems by providing professional and effective support to both clinical and non-clinical areas within the Hospital. In 2021, the department continued to provide administrative services across the Hospital in the following frontline areas:

Admissions, Antenatal Education, Baby Clinic, Bereavement, Birth Notification, Central Booking, Central Dictation, Chart Retrieval, Colposcopy, Community Midwives, Diabetics & Dietetics, Early Transfer Home, Fetal Assessment Unit, Gynaecological Clinic, Medical Records, Neonatal Unit, Out of Hours Unit, Out-Patients Department, Physiotherapy, Radiology, Satellite Clinics, Social Work Department, Antenatal and Postnatal Wards.

In January 2021, the Hospital rolled out a COVID-19 vaccination programme and on-site clinics. The Patient Services Department played a key role in this project. It was highly rewarding and great for us to play our part in this worthwhile initiative. In the last quarter of the year we also assisted in the booster vaccination programme.

During the year we trialled in three of our clinics the Swiftqueue patient information portal.

We also introduced the T-Pro systems for our dictation and patient information services. We plan to roll out these systems further in 2022.

Freedom of Information

In 2021 there were 1,337 written requests received under the Freedom of Information Act and Administrative Access. 85% of these personal requests were for copies of medical records.

I would like to thank the Staff for their dedication and hard work during a very challenging 2021.

I would also like to thank the Executive Management Team for their continued support and we look forward to a rewarding year ahead.

Purchasing and Supplies

2021 was another unprecedented year for all staff in the Purchasing & Supplies Department. We faced immense challenges to the supply chain as a result of Brexit, changes in customs checks, huge increases in shipping issues/costs, a worldwide shortage of raw materials and the continuing demand for PPE. As a result of these issues we were forced on a number of occasions to seek alternative products for stock/non stock items. The flexibility and understanding of Unit Managers throughout the hospital in relation to these issues was very much appreciated. At all times during this year we remained focused on the requirements of our hospital departments and clinics whilst mitigating the impact of these unprecedented market conditions.

Demand for PPE remained high but thankfully the hospital was in a good position regarding supply due to forward buying of stock and the backup of HSE supply. We would like to thank the Tendering Team for coordinating the HSE supply into the hospital.

The annual audit was undertaken in March and as always our full co-operation was provided. This audit is an essential part of what we do in the department to ensure best practice is adhered to at all times.

The business of the department is to provide maximum service with minimum risk whilst at all times striving to provide a high quality patient focused service. This would not be achieved without the continued dedication and commitment of all members of the Purchasing & Supplies Team. We would like to thank each and every member of the department for their hard work and support and we look forward to another great team effort in 2022.

Tendering

The objective of the Tendering Department, which works collaboratively with the Coombe Women and Infants University Hospital, is to ensure compliance with National and European procurement guidelines for expenditure throughout The National Maternity Hospital (NMH).

Activity and interaction between NMH, Health Business Services (HBS) and the Office of Government Procurement (OGP) continued and when financially advantageous, we benefited by utilising the national frameworks and contracts. A number of significant internal projects ran through 2021, none of which could not have been achieved without the involvement of staff in many departments.

2021 was another challenging year in NMH as activity in the hospital continued at a very high level. The requirements for non-contracted items continued to increase, thus providing a challenge period for sourcing, pricing, processing and delivery of goods. However, the year proved that by working together and supporting each other, we can make great things happen. The success that we had in 2021 could not have been met without the dedicated hard work of by our colleagues in the Purchasing and Stores Departments who supported us wholly throughout the year.

With the continued support of the Executive Management Team we have been provided with new systems to enable us to collate more comprehensive plans and we are looking forward to working with our all of our colleagues during 2022.

We wish to thank all the team for their continued commitment and hard work over the past year and look forward to a successful 2022 and all the challenges it will bring.


AJ

Catering

Catering staff member, Edele celebrates St Patrick's Day in green.

The Catering Department are committed to providing safe high quality wholesome food to all its service users.

During the past year the catering team in 'JJ's Bistro' have provided regular theme days and competitions to help boost morale. In November, we held our Cultural Diversity week with dishes from around the world.

In July, the Catering Department were awarded the 'Silver Happy Heart at Work' award: this is a prestigious award which is awarded by the Irish Heart Foundation to catering establishments which meet their guidelines for healthy eating. We were very grateful to the Dietitians who supported us during this process.

The Catering Department also has the honour of being accredited with ISO 22,000:2018 standard. This ensures we operate to the highest standards expected within a catering operation.

In October we retained our distinction in food safety assurance award achieving 99.5%. This was awarded by the Food Safety Professionals Association.

We remain committed to our training programme which is now based mostly on-line. Our plan for this year is to ensure that all staff are trained in customer service.

2022 will see many new challenges for us but we will continue to improve the department with the assistance of the Executive Management Team.

We would like to thank all departments in the hospital and especially our staff for their help and support throughout the year.

Chaplaincy

The Chaplaincy Department provide spiritual, emotional, grief and bereavement support to bereaved patients / families who have experienced early miscarriage, mid trimester loss, stillbirth neonatal death and compassionate induction of labour.

Work practices are continually adapted to ensure COVID-19 guidance is adhered to while at the same time ensuring that any further distress on bereaved parents and their families is minimised.

Spiritual/Religious and Practical Support

The Chaplaincy Department recognises and values all belief systems in a developing multi-cultural society through co-ordination of appropriate chaplaincy services with representatives and ministers of all faiths and those of none. All services being led by the Chaplaincy Department are viewed through a broad lens therefore delivering a 21st century model of spirituality through providing appropriate support.

Mortuary / Chapel of Rest

The Chaplaincy Department take full responsibility for the management / co-ordination of the mortuary chapel of rest services:

Activity

The table below shows the areas where we have provided support. The chaplaincy office is used as a quiet space providing spiritual, emotional, grief and bereavement support to bereaved families and to staff members. There is also 'other' unspecified and unplanned support provided: this support often occurs informally with staff, patients and their families throughout the hospital. Also included in the 'Other' support, is support is provided to families whose baby's death had not been acknowledged in any way in the past. Many years ago the type of bereavement support which we have today, was not available to bereaved families. In some cases, the loss was never spoken about or acknowledged. Sometimes we are contacted by families (NMH patients) who are stuck in their grief work and journey, or siblings who have only learned about their mothers / fathers unspoken loss in their advancing years. In these situations, we offer the bereaved family appropriate emotional, spiritual, sociological support. We also offer the bereaved family an opportunity to attend our remembrance service, including having their baby's details entered into our remembrance book. In some circumstances we have led a very gentle private ritual or prayer service for the bereaved family, if on assessment we feel it would help them to become unstuck in their grief work and journey forward.

Remembrance

Prior to the COVID-19 pandemic, the Chaplaincy Department organized and led liturgies throughout the year in the Hospital. This year's Remembrance Service did not take place in St Andrews Church due to the COVID-19 restrictions, however, we organised a reflective piece virtually for bereaved parents and families. In the instance where bereaved parents contacted us to view the remembrance book we liaised with the Assistant Director of Midwifery on duty to facilitate this appropriately in line with COVID-19 guidelines.

We provided support to a large number of bereaved families over the phone and in the Oratory at the time leading up to, and after the virtual remembrance service. As in previous years, many bereaved parents and bereaved adult siblings, requested that baby's names be included in the Book of Remembrance which is on permanent display in the hospital oratory. We facilitated the transportation of the Remembrance Book externally for entries to be made.

Activity Table

	2019	2020	2021
Services - naming / Baptisms/ removals	151	213	141
Stillbirth / IUD	108	113	113
Other support	50	70	72
Early miscarriage	8	10	7
Neonatal death	33	30	35
Termination of pregnancy	20	14	19

Refers to support offered and not actual cases.

Facilities Engineering

The Facilities Engineering Department (FED) would like to welcome the following staff members to the department, Mr Colm Grimes who has joined us as the Maintenance Carpenter, Mr Neil Walsh who joined us as the Hospital Electrician and Mrs Bozena Wrobel-Paprota who started as Service Coordinator. The FED would like to thank former staff members for their past service, Ashley Rowland, Carl Murphy Neil Maloney and Graham Tucker who have moved on. The FED would like to wish new starters and former staff alike, every success in their new careers.

The Maintenance Department

2021 has bought new challenges across our expanding campus. External factors such as the ongoing COVID-19 pandemic, Brexit and worldwide engineering shortages amongst other factors, have impacted in some way shape or form all of our teams.

The FED completed a number of projects including the installation of a new MRI chiller, complete upgrade to the nurse call system in the Antenatal Ward and an upgrade to the baby tag system throughout the NMH. 2021 also saw a substantial campus wide upgrade to the emergency lighting system: as part of ongoing energy saving initiative, we have replaced where possible old fluorescent lamps for efficient LED alternatives including external lights.

Working closely with the H&S department the FED completed COVID-19 related ventilation works to the basement locker rooms and the main staff canteen.

We also received 3,757 requisitions through our 'eREQ' system which enables each request to be managed appropriately.

Internal Projects

The Internal Building Team (IBT) completed phase 2 of the Labour and Birthing Unit (LBU) including: renovation of five Labour and Birthing rooms, meeting room, LBU break room, new Clinical Midwifery Manager (CMM3) office, two new store rooms, staff toilet and the corridor. The Operating Theatre 2 (OT2) negative pressure theatre project, which included a previous anaesthetic induction room, was converted into a positive/negative pressure switchable theatre and was commissioned and handed over during the year. A new four bedded 'Recovery Ward' adjacent to the main Theatre and new en-suite rooms in two wards were also completed. A building on Holles Row was renovated and is now occupied by our HR and Occupational Health Departments. A new autoclave facility was also handed over to the Hospital Sterile Services Department.

External Contractor Projects

Operation Theatre 4 was completed and handed over as was an office for the Master to facilitate a move back into the main Hospital.

Environmental Department

The NMH is still the only hospital in the country to achieve ISO 14001:2015 status this was made possible by the combined efforts and hard work of all the FED staff. A huge thanks to the staff and management within the NMH for their continued support and assistance.

General Services

2021 was another challenging year for all in frontline Healthcare. The pandemic continued and with another wave of a new variant arriving late in the year causing havoc with staffing availability. Even with staff already fatigued, they overcame this additional challenge and with resilience and dedication of all, we continued to provide full service for patients their partners and families.

I would like to take this opportunity to thank all support staff with the comfort in the knowledge that this too, as with all challenges, will pass.

Hygiene Services

The Hygiene Services Department maintains the environmental cleanliness of all patient, visitor and staff areas of the hospital, keeping the facilities clean and safe through the use of the latest technology and through the implementation of cleaning methods that are based upon international best practices.

The department's operations expanded in 2021 to encompass the additional cleaning requirements in the new areas of the Labour and Birthing Unit as well as the additional space located along Holles Row, where the Human Resources and Occupational Health Departments relocated. We continued the new services that were established the previous year to combat COVID-19, including the cleaning of frequently-touched surfaces and the 24-hour 'COVID-19 cleaning team' that ensured consistent transfer protocols and performed post-occupancy cleaning throughout the hospital. Recruitment opportunities allowed us to welcome Charles Cattier, Marina Cicherca and Gyta Pociute to our department during the year and all three new staff members have brought their skills and enthusiasm to their new roles. They are a very welcome addition to the team.

The department continued to contribute to the hospital's quality improvement initiatives with its participation in Quality and Safety Walk-Arounds, its involvement with the House Committee and Hygiene Committee, and through the hygiene audit process, which is conducted in conjunction with members of the Infection Control Team. This process measures compliance of the hospital's clinical and non-clinical hygiene activities against the requirements established by the Health Protection Surveillance Centre, logging and rectifying non-conformances to improve awareness and identify training needs. There were 85 audits conducted in clinical areas in 2021.

Switch/Reception

In 2021 despite an increased workload, the Switch Team continued to provide a seamless customer focused link between the public and the Hospital. A welcoming smile or voice from the Switch Team is the first contact the public have with the Hospital and we take great pride and pleasure in delivering this in a very professional manner.

Portering Services

The Portering Services Department provides an essential frontline service throughout The National Maternity Hospital including dedicated services to

Shane Kennedy of the Portering Services Department.

Andrew and Thomas Mullen of the Portering Services Department.

the Labour and Birthing Unit, Theatre, Laboratories, Laundry, Front Hall and Stores. The Department has continued to support education and training programmes including mandatory training when required as well as developing a new essential 'Emergency Skills Training' course in conjunction with the Labour and Birthing Unit. With the ongoing infrastructural projects of the Hospital on its current site, and its proposed co-location with St Vincent's University Hospital on the Elm Park Campus, the Portering Department participated on several committees providing advice on all aspects of the management of Portering Services including risk assessment and cost effectiveness. The Department is also represented on several committees such as the Goal 3 NMH Strategic Plan 2019 - 2023 and Goal 2 NMH Strategic Plan 2019 – 2023 as well as the Communications Group.

With the COVID-19 pandemic, the departmental processes evolved with new protocols being developed on a regular basis and a redesign of the Front Hall. The Department also formed part of the multi-disciplinary 'COVID-19 Response Team' used to handle patient transfers and deliver items to patients who could not receive visitors. All staff had to receive training in COVID-19 procedures, particularly with regard to patient transfers.

Thomas Mullen retired in 2021 after 19 years' service to hospital. We wish him a happy retirement.

2021 was another challenging year for all, dealing with the pandemic has been difficult for everyone. I would like to take this opportunity to thank all staff for all their dedication and hard work over the last 20+ months. With COVID-19 the last number of years have been extremely challenging and I think it is vital that we acknowledge the tremendous work and dedication displayed by our staff who have repeatedly performed above and beyond the call of duty under very challenging conditions. Our staff have overcome the challenges of the COVID-19 pandemic with commitment, motivation and professionalism.

"The Department has continued to support education and training programmes including mandatory training when required as well as developing a new essential 'Emergency Skills Training' course in conjunction with the Labour and Birthing Unit."

Education

BSc Midwifery Class 2021.

Education is a priority for The National Maternity Hospital (NMH) in order to provide the best possible evidence based care to the women and children attending. NMH is a busy clinical unit with a strong and proud history as a teaching hospital for both undergraduate and postgraduate students in all disciplines: medical, midwifery, nursing, physiotherapy, social work, laboratory science, dietetics and paramedics. As a teaching hospital for both University College Dublin and the Royal College of Surgeons of Ireland, nearly four hundred medical and midwifery students are trained here every year; these range from lectures, tutorials and introduction to clinical practice for Clinical One medical students, six-week placement in Clinical Two medicine, the eighteen-month Postgraduate Midwifery Programme and the four-year Bachelor of Midwifery degree students.

Most of the non-consultant hospital doctor (NCHDs) are registered for training either under the auspices of the Royal College of Physicians, the College of Anaesthetists or the Irish College of General Practitioners. The NMH provides training to fulfill the criteria for basic and specialist training in the specialties of Obstetrics and Gynaecology, Anaesthesia, Neonatology and Pathology. Our fellowship programmes in Maternal Fetal Medicine, Labour Ward Management, Maternal Medicine, Placenta Accreta Spectrum, Reproductive Endocrinology, Urogynaecology, Neonatology and Obstetric Anaesthesia continue to be popular choices for highly trained and motivated trainees.

Similar to every other sector of society in general and the hospital specifically, the ongoing Covid-19 pandemic affected teaching within the hospital, both changing the format and the subject of education over the year. Virtual education to facilitate social distancing and meet public health guidance has become the normal. Education rounds were provided through different virtual formats, meaning that not only did staff members have to learn differently but they also needed to become familiar in a short time with different platforms.

Table 1: Weekly multidisciplinary teaching programme

Monday	Tuesday	Wednesday	Thursday	Friday
Handover and MDT discussion twice a day on Labour ward, every week day and weekend day				
Placenta Accreta	Fetal Medicine	Maternal Medicine	Emergency care	Labour Ward care
			Grand Rounds	

Midwifery and Nursing Education and Practice Development

The Education and Practice Development Department is responsible for the organisation and coordination of ongoing education and the professional development of both qualified staff and student midwives and nurses at The National Maternity Hospital (NMH). The philosophy of life–long learning is promoted. Staff are supported to participate in educational programmes, conferences, seminars, and study days both internal and external. Several staff are pursuing education at Postgraduate degree, MSc and PhD levels.

In conjunction with the Centre of Midwifery Education, the NMH provides an ongoing continuous professional development programme for nurses and midwives. Due to COVID-19 programmes hosted by the CME were virtual as face-face programmes had to be cancelled in the interest of public health.

The NMH in partnership with the Higher Education Institutions, strive to maintain a high level of quality Midwifery and Nursing education to all students and qualified staff alike. The aim is to promote high standards of professional education, training and practice and professional conduct among nurses and midwives thus ensuring the safety and protection of the public. In 2021 the NMH continued to provided education and clinical placements for the BSc and H. Dip Midwifery programmes and provided Maternity Care placements for approx. 234 UCD General and Children's' & General Nursing students. There were an increased number of students on clinical placements in 2021 as students whose clinical placements were suspended in 2020 still had to complete clinical placements in 2021.

The Education and Practice Development team were instrumental in leading and providing the COVID-19 vaccination programme which commenced in January 2021.

Due to COVID-19 the education and practice development team looked at different ways to facilitate education and training. The aim was to develop different teaching methods and the implementation of an adaptive response to the emerging education and training challenges. Classroom based learning was mainly paused and educators within the hospital developed an eLearning hub not only for staff but also for women attending the hospital. Virtual classes were run and on ward training and education was further developed. Face-to- face Mandatory training such as Basic Life Support, National Resuscitation Programme and Manual Handling continued to be held face to face in small groups.

The hospitals first virtual Midwifery Graduation was held on 7th December 2021 for BSc Midwifery programme. Congratulations to the following midwifery students who were awarded prizes at the 2021 Charter Day: Gold Medals were awarded to Ella Connaughton (Higher Diploma) and Alice Dunne (BSc). The Elizabeth O Farrell Medals were awarded to Roisin Moran (Higher Diploma) and Orlagh Carey (BSc).

The Student Presentation Day 2021. The annual student presentation day was held on the 17th August 2021 in the Lecture Theatre of the NMH. 16 students presented on various research topics and it was a very enjoyable day.

Royal College of Surgeons in Ireland

Tanya Murphy, Hygiene Services

Thirty-three undergraduates from the Royal College of Surgeons in Ireland (RCSI) attended The National Maternity Hospital for their six weeks' rotation in Obstetrics and Gynaecology; seventeen students in January/February and sixteen in February/April. The students learned a great deal during their time in the hospital and provided very positive feedback on their teaching.

The programme was co-ordinated by Prof Declan Keane and Dr Nicola O'Riordan. Ms Miriam Shanley provided administrative support to the students. Teaching is provided by Consultants and various other members of hospital staff. In addition to the intensive obligatory e-learning programmes, the students, while rotating through all areas of the hospital, receive lectures, tutorials and 'hands on' demonstrations.

Twenty-five of our students achieved honours in their final Obstetrics and Gynaecology examination at the RCSI. Of these students, fifteen were awarded first class honours. Ms Rachel O'Toole will be awarded the NMH/RCSI medal for achieving the highest marks amongst the RCSI students who attended The National Maternity Hospital. This excellent performance reflects the enthusiasm of all those taking part in the teaching programme.

In addition, there were seven RCSI medical students who attended for clinical electives during the summer, completing further education and research projects. Two of these students went on to present their work at the RCPI JOGS meeting in November. The RCSI and NMH is also funding Dr Nicola O'Riordan's PhD addressing lactate biochemistry and uterine muscle proteomics in dystocic labour.

University College Dublin Obstetrics & Gynaecology

Prof Fionnuala McAuliffe, Consultant Obstetrician and Gynaecologist, (left), Pat McCann, Deputy Chairman (right) with Dr Sharon Dempsey, who won Declan Meagher Medal (First Prize) at The NMH Research and Innovation Symposium for her Project "National Neonatal Heart Valve Donation Protocol".

UCD Obstetrics & Gynaecology at The National Maternity Hospital (NMH) has a large and vibrant teaching programme delivered by Prof Fionnuala McAuliffe, Prof Colm O'Herlihy, Prof Mary Higgins, Prof Donal Brennan and organised by Ms Stephanie Begley. Tutors Dr Catherine Windrim, Dr Daniel Kane, Dr Grace Ryan and Dr Cathy McNestry provided excellence in teaching throughout the year. COVID-19 pandemic continued through 2021 requiring some change to our delivery of undergraduate Obstetrics & Gynaecology programmes, though we continued to maximise bedside and face-to-face clinical teaching, within HSE pandemic guidlines. All our teaching material is now also available online to facilitate students who are unable to attend due to COVID-19 reasons.

The John F. Cunningham Medal was awarded to Dr Sorcha Lynch and the Kieran O'Driscoll Prize to Mr Aveen Van Der Hoven.

We have an energetic and enthusiastic team of researchers ranging from MD to PhD students who are working on many projects.

Submission of MD/PhDs

In 2021, Dr Grace Ryan submitted her MD entitled 'To Investigate the Use of Virtual Reality and Augmented Reality in Medical Education'.

Dr Shauna Callaghan was awarded her PhD thesis entitled 'Examining the synergistic role of midwives and obstetricians in health promotion for women in pregnancy: A focus on nutrition, gestational weight gain, and physical activity.

UCD Perinatal Research Centre (www.ucd.ie/medicine/perinatal, Twitter @UCDPerinatal)
The centre's work aim is excellence in perinatal research to improve clinical outcomes for mothers and their infants.

Hollestic nutrition smart phone app

We are delighted that a smart phone app developed by the centre in collaboration with Dr Eileen O'Brien and Ms Sinead Curran at the NMH Clinical Nutrition and Dietetics Department, was launched in 2021 for all pregnant women at NMH, nationally and internationally under name Hollestic, available on app store and free to download. It is based on the PEARS randomised controlled trial that found that a smart phone application supported lifestyle intervention resulted in less gestational weight gain, better sugar levels in mothers and less large for gestational infants. To date it has **>100,000 downloads**, with the majority from outside Ireland. This is an excellent example of translation of research into a clinically useful tool for women attending NMH and globally.

Research funding

Research is funded by Science Foundation Ireland, Health Research Board Centre for Health and Diet Research, Health Research Board Mother and Baby Clinical Trials Network, Perinatal Ireland, and by the NMH Medical Fund (Fionnuala McAuliffe).

RISE Judges.

Artificial Intelligence PREMie Science Foundation Ireland (Role: Society Champion) Concept Phase: €20,000 (Principal Investigator (PI) Mary Higgins)
Artificial Intelligence PREMie Science Foundation Ireland (Role: Society Champion) Seed Phase: €200,000 (PI Mary Higgins)
Artificial Intelligence for Societal Good Challenge Science Foundation Ireland €1,000,000 (PI Mary Higgins)
Irish Cancer Society Womens Health Initiative "Development of a life after cancer clinic – a national pilot" - €300,000 direct costs, (PI Donal Brennan)
Science Foundation Ireland-Precision Oncology Ireland "Dynamic Modelling of T cell response to immune checkpoint inhibitors in high grade serous ovarian cancer" (€1,265,908 direct costs) (Donal Brennan Co-PI with Prof. Walter Kolch)
Irish Cancer Society Immuno-oncology Award "The Role of TIGIT in ovarian Cancer" (€350,000 direct costs) (Donal Brennan Co-PI with Prof. Lydia Lynch)
Microbe Mom, Science Foundation Ireland
ROLO pre-teens, National Children's Research Centre

Awards / Prizes

- UCD Perinatal Research Centre team won the regional HSE Spark Ignite Ireland regional competition for the development of a web based version of the FIGO nutrition checklist.
- Prof McAuliffe was awarded the highly prestigious International Federation of Gynaecology and Obstetrics FIGO Women's award in recognition for her significant contribution to women's health.
- Social Impact Award 2021 from Analytics Institute (shortlisted).

UCD Impact Case study (runner-up).

- AI Awards Ireland: Best application to achieve Social Good 2021 (shortlisted).
- Best in Session iPoster – Brendan Dempsey, RCOG World Congress.
- British Maternal and Fetal Medicine Society: Cara Yelverton received best student award at meeting for paper on fetal growth trajectories.

Researchers working in Obstetrics & Gynaecology in 2021

- Dr Marie Conway, postdoctoral fellow
- Dr Anthony Rafferty, postdoctoral fellow
- Dr Aisling Geraghty, B2B Clinical Trials Manager
- David Byrne, research assistant
- Ms Grace Mealy, research assistant
- Ms Niamh Donnellan, research assistant
- Shauna Callaghan, research midwife and PhD student
- Cara Yelverton, PhD student
- Sarah Louise Killeen, PhD Student
- Dr Grace Ryan, MD student
- Dr Niamh Keating, MD student
- Dr Marguerite O'Brien: MSc Student
- Ms Sophie Callanan, MSc student
- Mr Brendan Dempsey, PhD student
- Ms Yuhan Du, PhD Student
- Ms Anna Delahunt, PhD student
- Dr Kate Glennon, MD student
- Dr Bobby O'Leary MD student
- Dr Fionan Donohoe – MD Student
- Romina Silva PhD student
- Martina Kriedal – PhD student– SBI
- Donagh Egan - PhD Student – SBI
- Dr Vadim Zhernovkov – Assistant Professor – SBI
- Mr Michael Metoudi – Research Assistant – SBI
- Ms Yvonne O'Meara – Project Manager – Survivorship
- Ms Aedin Roberts – CNS survivorship
- Ms Louise Comerford – CNS Survivorship

Research Projects

UCD Perinatal Research Centre www.ucd.ie/medicine/perinatal, Twitter @UCDPerinatal was established in 2014 in recognition of the significant size, output and impact of the group. Ongoing research projects are listed below.

ROLO Kids

This is a follow-up study at age 2, 5 and 9-10 years of mothers and infants from the ROLO study Randomised control trial of low glycaemic index diet to reduce recurrence of macrosomia.

Collaborators:

Dr Sharleen O'Reilly, UCD School of Agricultural and Food Science. Dr Ciara McDonnell, Paediatric Endocrinology, Tallaght Hospital. Prof Cecily Kelleher, UCD School of Public health, Physiotherapy and Population Science. Dr Catherine Mooney, UCD School of Computer Science

Microbiome Mum – role of maternal microbiome in influencing neonatal microbiome and impact of a probiotic on maternal and fetal health.

This study examines the inter-relation between mother and baby microbiome and whether a probiotic given to Mum can have positive impacts on maternal and infant health

Collaborators:

Dr Paul Cotter Teagasc. Dr Douwe Van Sinderen, University College Cork

Perinatal Endocrinology Research Group

A number of studies have been performed examining the interaction of vitamin D and lipids on maternal and fetal health.

Collaborators:

Dr Malachi McKenna, Endocrinology, St Vincent's Hospital, Dublin. Dr Patrick Twomey, Pathology, St Vincent's Hospital, Dublin. Dr Rachel Crowley, Endocrinology, St Vincent's Hospital, Dublin. Dr Ciara McDonnell, Paediatric Endocrinology, Tallaght Hospital

Latch-On: Multicentre RCT across 5 Hospitals in Ireland East

This is an ambitious multicentre randomised controlled trial to support breastfeeding amongst women with BMI > 25 with includes intensive antenatal and postnatal support.

Collaborators:

Prof Mary Brosnan, National Maternity Hospital. Dr Denise O'Brien, UCD School of Nursing, Midwifery and Health Systems. Dr Barbra Coughlan, UCD School of Nursing, Midwifery and Health Systems

Bump to Baby and me B2B

A multifaceted smart phone application supported lifestyle intervention and health coach supported intervention to reduce GDM in at risk women at NMH, Bristol, Granada and Melbourne commenced recruitment.

FIGO Pregnancy Nutrition and Obesity Initiative

We are developing clinical guidelines and a nutrition checklist that can be used globally to assist healthcare professionals caring for pregnancy women to advise them about appropriate nutrition before, during and after pregnancy.

HRB Mother and Baby Clinical Trials Network

The National Maternity Hospital is one of the key clinical sites within this network, an all-Ireland research consortium which carries out clinical studies in pregnancy across seven academic maternity and neonatal units.

Collaborators:
Prof Fergal Malone, Royal College of Surgeons of Ireland, Prof Sean Daly, Coombe Women's University Hospital, Prof John Morrison, University College Hospital Galway, Prof John Higgins, University College Cork, Prof Amanda Cotter, University of Limerick, Dr Alyson Hunter, Queen's University Belfast

VR Baby
We are developing a virtual reality model of pregnancy to enhance medical and midwifery students experience of learning.

Collaborator: Prof Eleni Mangina, UCD School of Computer Science

Medical Student Teaching
Collaborative project with UCD Psychology studying women's and students' experiences of bedside teaching. Development and Validation of a questionnaire studying women's attitudes towards bedside teaching.

Patient as Expert by Experience
Qualitative research of women's lived experience of a diagnosis of Gestational Diabetes; development and validation of questionnaire studying women's attitudes towards a diagnosis of gestational diabetes.

Second Victim
To assess prevalence of second victim in maternity care in Ireland and the impact on clinical staff of adverse outcomes.

IRELAND study
Multicentre RCT in aspirin use to prevent pre-eclampsia in women with pre-gestational diabetes.

Diabetes
Role of fenugreek for breastfeeding in women with gestational diabetes.

Stigma in Abortion Care Providers
Qualitative and quantitative study of service providers' views of stigma related to their clinical work.

Ovarian Cancer Immunology (co leads Prof D Brennan and Prof Walter Kolch)
Joint project with Astra Zeneca and Precision Oncology Ireland focused on improving response to immune checkpoint inbitors in ovarian cancer and understanding novel immune checkpoints such as TIGIT funded by Irish Cancer Society in collaboration with Prof Lydia Lynch (TCD).

Obesity Related Carcinogenesis
Project focused on understanding the impact of intentional weight loss on endometrial biology in conjunction with Prof Donal Brennan, Prof Carel leRoux and Prof Helen Heneghan in UCD.

Survivorship
Irish Cancer society funded project focused on development of evidence based survivorship programs for women living with and after cancer, Prof Donal Brennan.

Placenta Accreta Spectrum (PAS)
Projects focused on aetiology and long term impact of PAS on maternal mental health, Prof Donal Brennan.

Medical Education ("MedEd") Electives
Prof Mary Higgins

We have now run three highly successful electives in Medical Education with 22 medical student participants. As well as students gaining increased knowledge in MedEd theories, student output includes the following:

- A 100-page handbook for final year students reviewing Obstetrics and Gynaecology
- "Obscast" podcast
- Multiple MedEd infographics on subject's that students identified as relevant and under resourced in the standard curriculum
- A 300-question multiple choice question bank to allow for formative learning
- An 80-page handbook reviewing History Taking and Examination skills in Obstetrics and Gynaecology
- Presentations at the INHED, AMEE and ASME meetings

NMH Research and Innovation Symposium RISE

The research, education and innovation strategy group hosted our second NMH research and innovation symposium on Dec 2nd and received over 60 abstracts from all areas of the hospital presented. Ms Caroline Brophy and her team received the Prof Colm O'Herlihy medal for best research presentation entitled Perineal Granulation Tissue – The POPPY Clinic Experience.

Dr Sharon Dempsey received the Dr Declan Meagher medal for best innovation presented entitled 'National Neonatal Heart Valve Donation Protocol'. It was an exceptionally energetic and vibrant day with excellent attendance.

Research Ethics Committee

Prof John Murphy, Consultant Neonatologist and Chair of the Research Ethics Committee.

The National Maternity Hospital Research Ethics Committee is both a Local and National Ethics Committee. It is approved by the Department of Health to review National Perinatal Studies. It reviews Obstetric, Neonatal, Anaesthetic, Gynaecology and Perinatal Pathology research.

Monthly meetings are held with the exception of August. There is one quarter lay attendance and a quorum is required at each meeting.

"In 2021 the Research Ethics Committee received 32 new research application proposals, 4 of which were COVID-19 related. 23 of the applications were approved at first review, 9 needed further clarification."

Generally, the applications are approved at each meeting; if not approved the Chairman will request clarification on a particular issue. A final decision is always made at the second review of the Committee. The average length of time between receipt of an application and a final decision by the Committee is 4-8 weeks

In 2021 the Research Ethics Committee received 32 new research application proposals, 4 of which were COVID-19 related. 23 of the applications were approved at first review, 9 needed further clarification.

We also approved 23 audits within The National Maternity Hospital which was an increase from 6 approved in 2020.

Healthy Ireland

The Healthy Ireland (HI) Group at The National Maternity Hospital (NMH) aims to support staff and patient wellbeing under the pillars of the national Healthy Ireland (HI) program and is chaired by Sinead Curran.

HI was pleased to welcome new members Caoimhe De Brun, Aoife Menton, Jennie Fitzgerald and Clare McElroy to the group and to have the support of Jennie Cotter, Communications Officer.

The HI group relies on input and effort from colleagues working across diverse areas of the hospital who help to run events or programs in addition to their 'day job'. While the ongoing restrictions of the Covid-19 pandemic impacted on HI activities throughout 2021, staff participation and engagement with various challenges and quizzes was notable for the fun involved as much as for the competitive success in activity challenges.

In September, the Catering Department started the assessments needed for the Irish Heart Foundation (IHF) 'Happy Heart at Work' with the support of the dietitians. A salad bar was introduced in the canteen and adjustments made to the recipes and menus, resulting in the prestigious Silver Award from the IHF at the end of the year.

Another highlight of 2021 was the Staff Wellness Week in October, co-ordinated by the HR team with the support of HI. There was a range of events available across the week addressing aspects of physical, emotional, mental and financial wellbeing including practical sessions on yoga and stretching, smoking cessation and pension planning.

We also held the 'Smarter travel Walktober Challenge' which was a great success with the *FAU WALKERS*, coming in first place for The National Maternity Hospital.

We look forward to running more face-to-face events as restrictions are lifted in 2022.

Staff having an ice cream treat.

Jan- Feb: Stress Control Program; 21 Day Walking Challenge
March: 'Marchathon' Step Challenge
April: National Workplace Wellbeing Day
May: Daylight for Health
September: Irish Heart Foundation 'Happy Heart at Work' (Sept-Dec); Culture Night and HI
October: Staff Wellness Week 2021; 'Walktober' Step Challenge
November: Light up your Bike campaign

Development Project Office: NMH at Elm Park

The Operational Readiness (OR) Programme Phase 1 was completed in January 2021. This team worked with St Vincent's University Hospital, HSE Estates and Accenture staff, to complete the Final Business Case (FBC) for the project which was approved by the Project Board in May 2020 and submitted to HSE in June 2020 as the first step in the approval process. The FBC continues to progress through the required approvals processes and we understand that HSE Board approved it for submission forward to the Department of Health in December 2021.

The Hospital has undertaken considerable changes to operations in NMH in response to COVID-19. The challenges experienced in implementation of social distancing and patients requiring isolation have demonstrated and highlighted the requirement for the new hospital both in terms of infrastructure and space. During this period of time many of the NMH @ Elm Park project staff were redeployed, providing support to other NMH departments in the response to the COVID-19 pandemic.

The Design Team issued the draft Stage 2c report to HSE Estates in December 2021, which will form the basis for the tender for the construction of the new hospital. NMH, SVUH, HSE Estates and the Design Team have collaborated and inputted requirements for the new hospital. It is hoped that the final report is approaching completion by early 2022, marking a significant milestone for the project.

Digital Health Steering Group (DHSG)

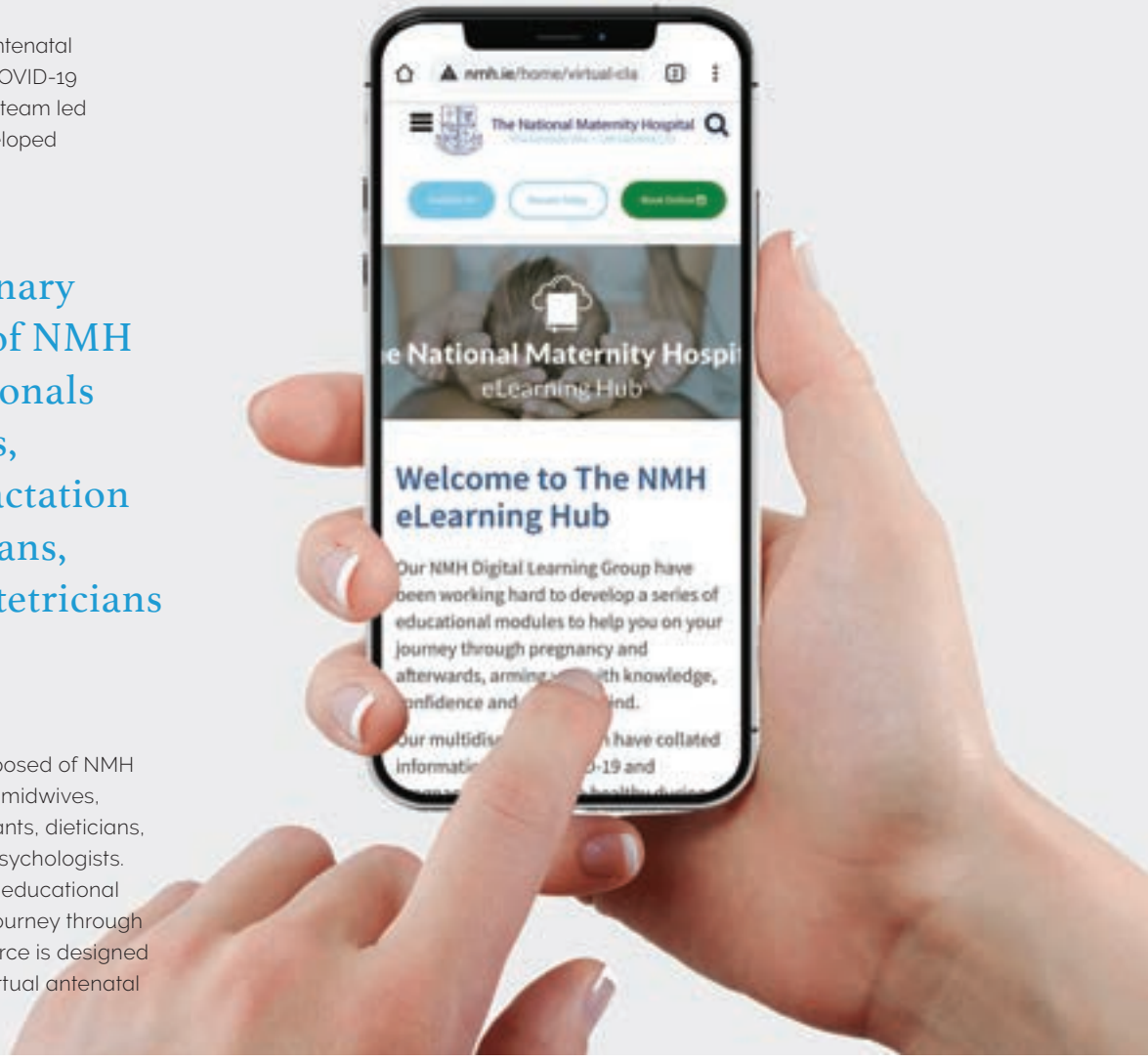
The DHSG have developed and completed the Digital Health Implementation Plan for the new hospital. In 2021 the group progressed the following work:

- Progressed Capital build alignment, coordinating ICT works with capital build works.
- Work continued with the NMH OR Team to ensure Operational Readiness Alignment with the ICT works.
- An Integrated PMO strategy was agreed between the DHSG and Project Team.
- A Clinical Engagement Group was established and made good progress reviewing Functional Policies for clinical departments of the NMH.
- As part of the Clinical Engagement Group a number of enabling projects have been identified. The Single Sign On (SSO) project for the NMH has progressed well, with formal approval by DPER putting NMH in scope for phase 1.
- 2022 estimates calculated and submitted for ICT consultancy/staffing for NMH.
- A preliminary DHSG Risk Register was developed for construction schedule. This is based on the standardised HSE Risk Matrix and Issue Scoring and includes descriptions of risks, mitigation measures and follow-up discussions.
- Key decisions in relation to the most effective network procurement strategy for NMH @ Elm Park were agreed in principle.
- The ICT group submitted ICT requirements and dependencies for inclusion in the Stage 2c Report.

Members of the NMH at Elm Park Development Team Prof Shane Higgins, Ronan Gavin, Mary Brosnan, Dr Roger McMorrow, Alistair Holland, Dr Orla Sheil, Dr Jenny Walsh, Martin Keane (IEHG), Damian McKeown, Eoghan Hayden, Emmet Travers, Gillian Canty, Martin Creagh, Geraldine Duffy, Sarah McCourt.

The NMH eLearning Hub

To complement and support antenatal education needs during the COVID-19 pandemic, a multidisciplinary team led by Professor Gráinne Flannelly developed an eLearning Hub.



"This multidisciplinary team is composed of NMH healthcare professionals including midwives, physiotherapists, lactation consultants, dieticians, paediatricians, obstetricians and psychologists."

This multidisciplinary team is composed of NMH healthcare professionals including midwives, physiotherapists, lactation consultants, dieticians, paediatricians, obstetricians and psychologists. Each resource contains a series of educational modules to help patients on their journey through pregnancy and beyond. This resource is designed to complement and supplement virtual antenatal education classes.

The NMH education module series

Financial Statements

Extracts from the Hospital Income & Expenditure Account For the Year Ended 31 December 2021

Income And Expenditure	2021	2020
	€000	€000
Ordinary Income		
Miscellaneous	3,270	319
Treatment Charges	12,102	11,706
	15,372	**12,025**
Ordinary Expenditure - Pay		
Medical NCHD's	6,457	6,118
Consultants	8,753	9,492
Nursing	29,525	27,841
Para-Medical	6,529	5,992
Housekeeping	2,562	2,457
Catering	2,157	2,049
Porters	1,325	1,221
Maintenance	753	936
Administration	8,229	7,652
Pensions	4,629	2,670
	70,919	**66,428**
Ordinary Expenditure - Non Pay		
Medicines, blood and gas	2,588	2,132
Laboratory expenses	1,494	2,016
Medical and surgical appliances	4,891	3,805
X-ray expenses	165	659
Provisions/catering	739	681
Heat power and light	594	549
Cleaning and washing	1,125	952
Furniture, hardware and crockery	93	14
Bedding and clothing	89	107
Maintenance	631	314
Transport and travel	114	125
Finance	626	319
Bad debt provision	7,255	(303)
Office expenses	710	702
Education and training	142	214
Computer expenses	609	605
Miscellaneous	1,719	1,295
Depreciation	3,576	3,257
Amortisation	(3,576)	(3,257)
	23,584	**14,186**
Deficit for Year		
Net expenditure	**79,131**	**68,589**
Annual Allocation	76,006	72,812
less amount deferred in respect of fixed asset additions	(3,557)	(2,726)
(Deficit)/Surplus	**(6,682)**	**1,497**

Extracts from the Hospital Income & Expenditure Account For the Year Ended 31 December 2021

Cumulative Figures	2021	2020
	€000	€000
Surplus / (Deficit) Brought Forward	4,532	3,035
Surplus / (Deficit) transferred from Income & Expenditure	(6,682)	1,497
Surplus / (Deficit) Carried Forward	**(2,150)**	**4,532**

Extracts from the Hospital Balance Sheet as at 31 December 2021

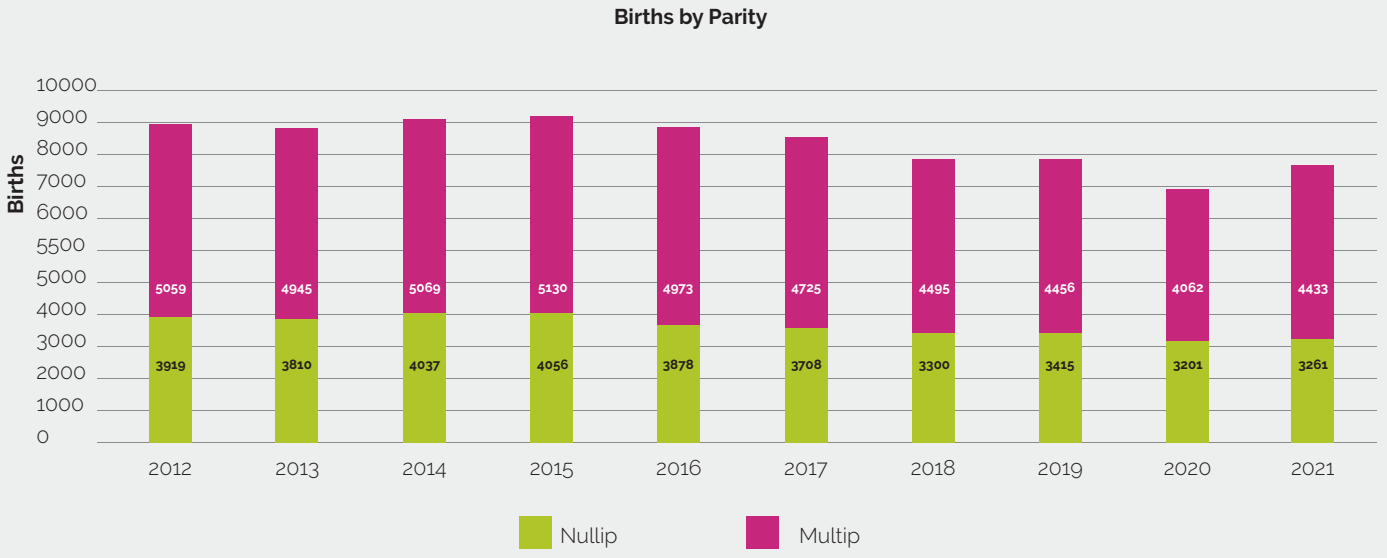
Balance Sheet	2021		2020	
	€000		€000	
Fixed Assets		**76,058**		**75,442**
Current Assets				
Stocks	394		788	
Debtors	10,793		15,528	
Cash & Bank	-		-	
	11,187		**16,316**	
Current Liabilities				
Creditors	12,658		11,105	
	12,658		**11,105**	
Net Current Liabilities		(1,471)		5,211
Creditors *(amounts falling due after more than one year)*				
Deferred Grant		(31,975)		(31,359)
Loans from Funds		(2,187)		(2,187)
Net Assets		**40,425**		**47,107**
Represented By:				
Revaluation Reserve		42,533		42,533
Accumulated Surplus / (Deficit) at end of year		(2,150)		4,532
Other Funds		42		42
		40,425		**47,107**

Pay Costs	2021		2020
Consultants and NCHDs	15,210		15,610
Paramedical	6,529		5,992
Administration	8,229		7,652
Midwifery and Nursing	29,525		27,841
Support Services	6,797		6,663
Pensions and Lump Sums	4,629		2,670
	70,919		**66,428**

Non Pay Costs	2021		2019
Medical	9,138		8,612
Maintenance and Furnishings	1,459		1,102
Finance	626		319
Bad debt provision	7,255		-303
Computer Expenses	609		605
Utilities	1,812		1,515
Training and Assoc. Costs	256		339
Office Expenses	710		702
Miscellaneous	1,719		1,295
	23,584		**14,186**

Clinical & Administrative Activity Analysis

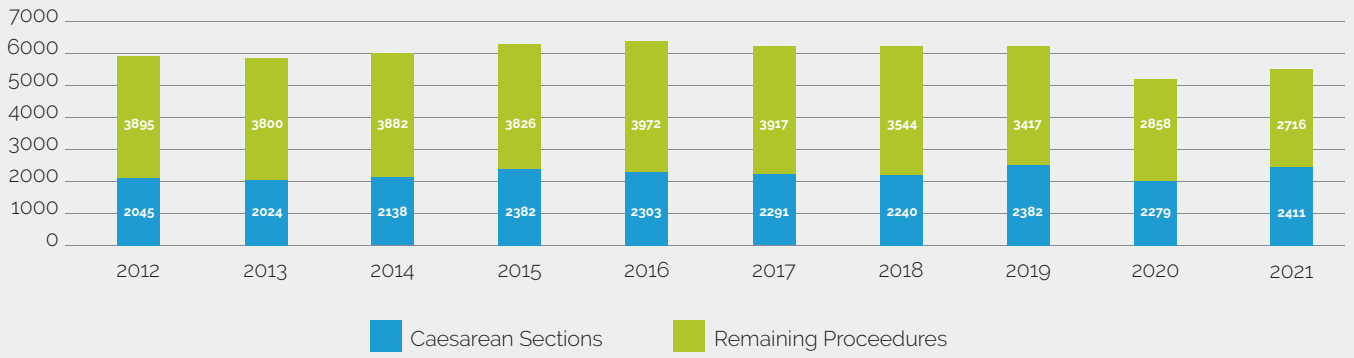
Mothers Delivered	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Nullip	3919	3810	4037	4056	3878	3708	3300	3415	3201	3261
Multip	5059	4945	5069	5130	4973	4725	4495	4456	4062	4433
Total	**8978**	**8755**	**9106**	**9186**	**8851**	**8433**	**7795**	**7871**	**7263**	**7694**
% Nullip	43.7%	43.5%	44.3%	44.2%	43.8%	44.0%	42.3%	43.4%	44.1%	42.4%



Theatre Activity	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Caesarean Sections	2045	2024	2138	2382	2303	2291	2240	2382	2279	2411
Remaining Procedures	3895	3800	3882	3826	3972	3917	3544	3417	2858	2716
Total	**5940**	**5824**	**6020**	**6208**	**6275**	**6208**	**5784**	**5799**	**5137**	**5127**

** May and June estimated due to cyber-attack*

Theatre Procedures



Outpatient Activity	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Obstetric*	56201	62127	67411	65888	69157	63688	71454	73855	73642	79753
Gynaecology & Colposcopy	16730	17866	16505	17940	16281	15493	15558	15959	14214	10152
Neonatology	4371	4255	4365	3777	3914	4021	3367	3443	2765	3159
Total	**77302**	**84248**	**88281**	**87605**	**89352**	**83202**	**90379**	**93257**	**90621**	**93064**

Fetal Medicine Unit	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Booked Attendances	19327	21360	22835	22829	21746	21309	21539	23679	24779	22207

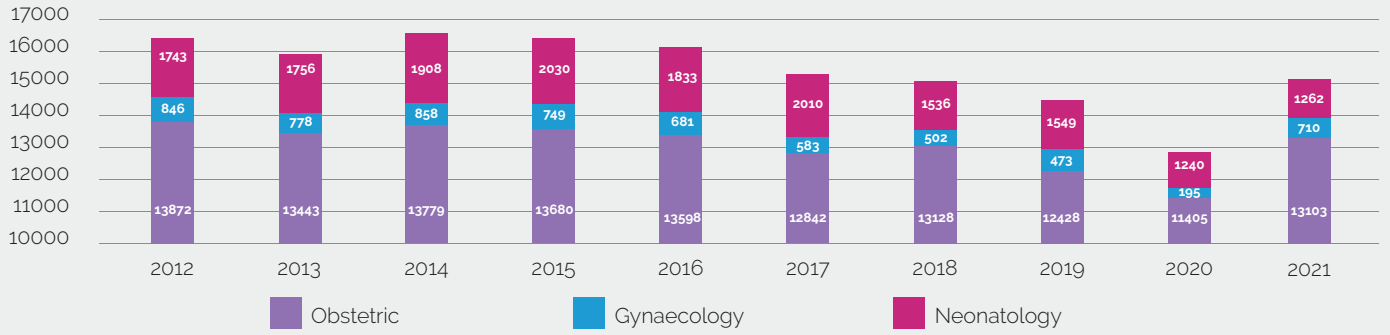
** includes sub-specialties. Excludes all unbooked attendances*

Inpatient Discharges	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Obstetric	13872	13443	13799	13680	13598	12842	13128	12428	11405	13103
Gynaecology	846	778	858	749	681	583	502	755	532	710
Neonatology	1743	1756	1908	2030	1833	2010	1536	1549	1240	1262
Total	**16461**	**15977**	**16565**	**16459**	**16112**	**15435**	**15166**	**14732**	**13177**	**15075**

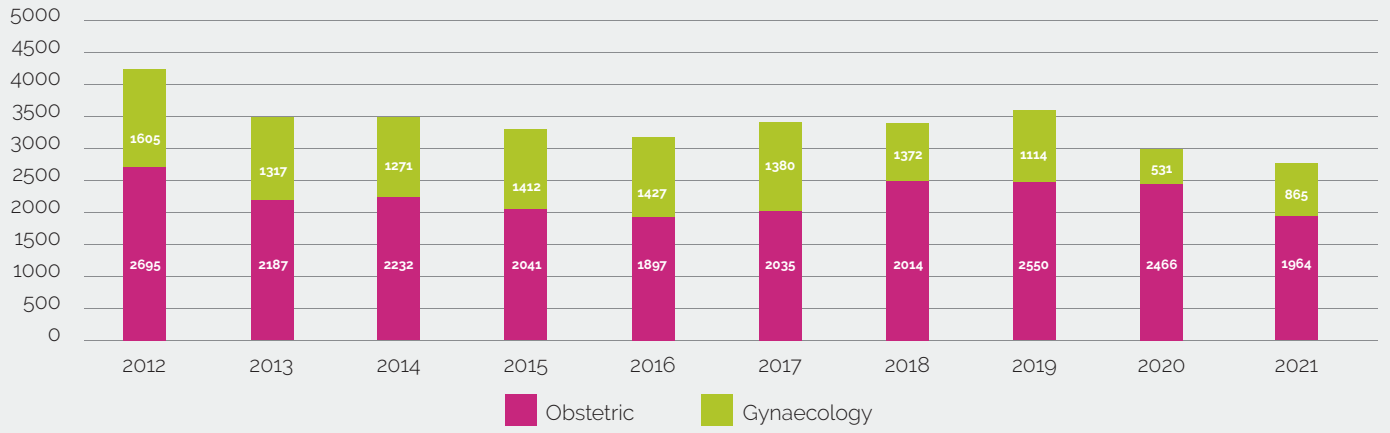
Day Cases	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Obstetric	2695	2187	2232	2041	1879	2035	2014	2550	2466	1964
Gynaecology	1605	1317	1271	1412	1427	1380	1372	1114	531	865
Total	**4300**	**3504**	**3503**	**3453**	**3306**	**3415**	**3386**	**3664**	**2997**	**2829**

	2018	2019	2020	2021
Emergency Room Attendances	13101	14146	11115	11442

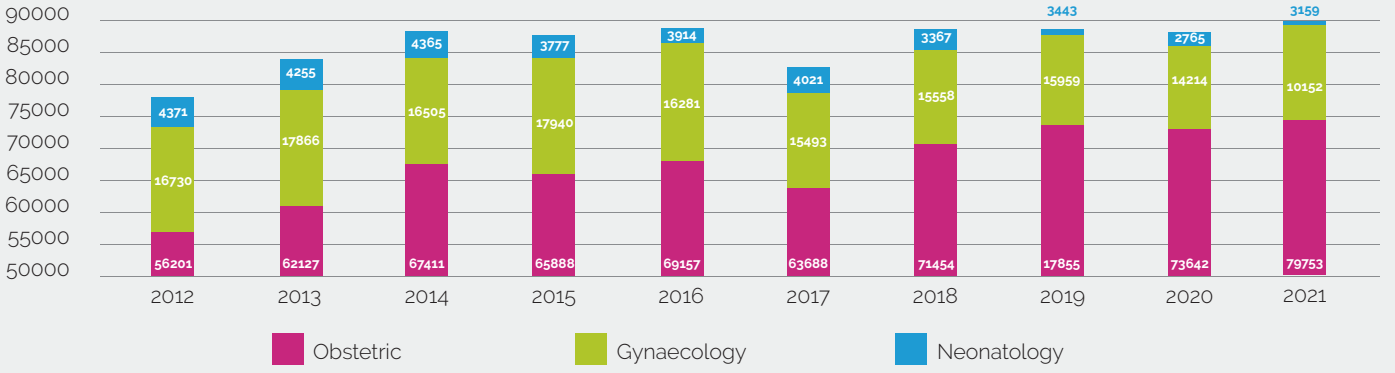
Inpatient Discharges



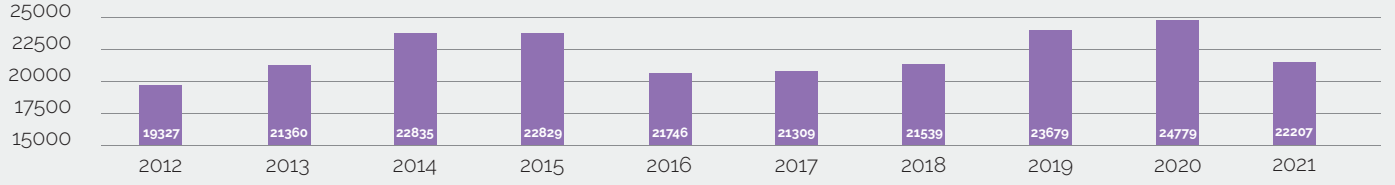
Day Cases



Outpatient Attendences



Fetal Medicine Unit Attendances



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Mothers Delivered (inc. < 500g)	10088	9855	10026	10092	9790	9357	8671	8700	8158	8567
Mothers Delivered (>= 500g and/or 24 wks)	8978	8755	9106	9186	8851	8433	7774	7871	7263	7694
Para 0	3918	3810	4034	4052	3878	3684	3271	3415	3201	3261
Para 1+	5060	4945	5072	5134	4973	4759	4503	4456	4062	4433
Nulliparous %	*43.6*	*43.5*	*44.3*	*44.1*	*43.8*	*43.7*	*42.1*	*43.4*	*44.1*	*42.4*
Maternal Mortality	1	0	0	0	1	0	0	0	0	0
Babies Born (>= 500g)	9142	8960	9309	9389	9037	7914	7914	8009	7402	7855
Perinatal Mortality*	51	64	55	59	53	60	60	74	66	64
Perinatal Mortality Rate	5.6	7.1	5.9	6.3	5.9	7.6	7.6	9.2	8.9	8.1
Congenital Anomalies	*19*	*22*	*22*	*21*	*23*	*18*	*26*	*32*	19	19
Corrected Perinatal Mortality Rate	3.5	4.7	3.6	4.1	3.3	5.3	4.3	5.3	6.4	5.7
Caesarean Section %	*22.8%*	*23.1%*	*23.5%*	*25.9%*	*26.0%*	*27.2%*	*28.9%*	*30.3%*	*31.4%*	*31.3%*
Operative Vaginal Delivery %	*11.1%*	*14.0%*	*11.1%*	*12.7%*	*14.2%*	*13.0%*	*13.7%*	*12.5%*	*12.7%*	*12.3%*
Normal Delivery %	*66.1%*	*65.9%*	*65.4%*	*61.4%*	*59.8%*	*59.8%*	*57.0%*	*57.2%*	*55.9%*	*56.5%*
*Induction %***	*26.4%*	*26.5%*	*27.1%*	*27.6%*	*28.6%*	*29.8%*	*27.8%*	*31.0%*	*34.0%*	*34.4%*

Comparative Table of Pre-Viable and Hydatidiform Moles

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Mothers delivered <500g	1027	999	920	834	842	828	808	809	798	761
Hydatidiform moles	23	19	23	11	27	27	29	14	31	44
Ectopic pregnancies	82	82	92	61	70	69	60	65	66	68

Births by Mothers' Age on Delivery	Perinatal Deaths	PNMs %	Rate per '000 Births	Total Births
< 20 years	3	4.7%	90.9	33
20 - 24 years	3	4.7%	9.1	328
25 - 29 years	6	9.4%	7.0	857
30 - 34 years	21	32.8%	7.8	2703
35 - 39 years	22	34.4%	7.1	3084
40 + years	9	14.1%	10.6	850
Total	**64**			**7855**

Births by Parity				
0	35	54.7%	10.5	3336
1,2,3	*29*	*45.3%*	*6.6*	*4406*
4+	0	0.0%	0.0	113
Total	**64**			**7855**

Birthweight				
Birthweight				
<500	2	3.1%	666.7	3
500 - 999g	33	51.6%	500.0	66
1000 - 1499g	6	9.4%	117.6	51
1500 - 1999g	5	7.8%	52.6	95
2000 - 2499g	7	10.9%	28.2	248
2500 - 2999g	4	6.3%	5.0	800
3000 - 3499g	5	7.8%	2.0	2529
3500 - 3999g	2	3.1%	0.7	2762
4000 - 4499g	0	0.0%	0.0	1092
4500 - 4999g	0	0.0%	0.0	185
5000g +	0	0.0%	0.0	24
Total	**64**			**7855**

Gestation				
< 26 weeks	30	46.9%	697.7	43
26 - 29 + 6 days	6	9.4%	130.4	46
30 - 33 + 6 days	8	12.5%	65.0	123
34 - 36 + 6 days	7	10.9%	19.5	359
37 - 41 + 6 days	12	18.8%	1.7	7116
42 + weeks	1	1.6%	6.0	168
Total	**64**			**7855**

10 Year Analysis of Perinatal Mortality

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Perinatal Deaths	**51**	**64**	**55**	**59**	**60**	**60**	**60**	**74**	**66**	**64**
PNMR per '000 Births	5.6	7.1	5.9	6.3	5.9	7.6	7.6	9.2	8.9	8.1
Antepartum Deaths	**20**	**29**	**23**	**24**	**19**	**26**	**27**	**29**	**35**	**27**
Percentage of Total	39.2	45.3	41.8	40.7	35.8	43.3	45.0	39.2	53.0	42.2
Intrapartum Deaths	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Percentage of Total	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Early Neonatal Deaths	**11**	**13**	**10**	**14**	**11**	**9**	**7**	**13**	**12**	**18**
Percentage of Total	21.6	20.3	18.2	23.7	20.8	16.7	11.7	17.6	18.2	28.1
Congenital Anomalies	**19**	**22**	**22**	**21**	**23**	**19**	**26**	**32**	**19**	**19**
Percentage of Total	37.3	34.4	40.0	35.6	43.4	35.2	43.3	43.2	28.8	29.7

Infants whose birthweight was >=500g and/or with EGA >=24 wks and liveborn infants who died within 7 days.

10 Year Analysis of Perinatal Mortality Excluding Congenital Anomalies

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total Births >=500g and/or >=24 wks	9142	8954	9309	9389	9037	8619	7914	8009	7402	7855
Births >=500g and/or >=24 wks less lethal congenital anomalies	9123	8932	9287	9368	9014	8600	7888	7977	7383	7836
Stillbirths	21	29	23	24	19	26	27	29	35	27
Stillbirth rate per '000 births	2.3	3.2	2.5	2.6	2.1	3.0	3.4	3.6	4.7	3.4
Early Neonatal Deaths	11	13	10	14	11	9	7	13	12	18
ENND rate per '000 births	1.2	1.5	1.1	1.5	1.2	1.0	0.9	1.6	1.8	1.7
Total Perinatal Mortality	32	42	33	38	30	34	34	42	47	45
Corrected Perinatal Mortality Rate	3.5	4.7	3.6	4.1	3.3	4.0	4.3	5.3	6.4	5.7

Table 1: Patients Attending	
Mothers Delivered >= 500g	7694
Mothers Delivered < 500g	761
Ectopic Pregnancies	68
Hydatidiform Moles	44
	8567

Table 2: Maternal Deaths	0

Table 3: Babies Born (24 wks EGA and/or >= 500g)	
Singletons	7540
Twins	149
Triplets	5
Quadruplets	0
Total Births	**7694**

Table 4: Obstetric Outcome	%
Spontaneous Vaginal Delivery	56.5%
Forceps	2.6%
Ventouse	8.6%
Ventouse/Forceps	1.0%
Total Operative	12.2%
Caesarean Section	31.3%
	100.0%

Induction	2644 (34%)

Table 5: Perinatal Deaths	
Antepartum Deaths	27
Intrapartum Deaths	0
Total Stillbirths	*27*
Early Neonatal Deaths	18
Congenital Anomalies (SBs and ENNDs)	19
Total Perinatal Deaths	**64**

Table 6: Perinatal Mortality Rates		
Overall Perinatal Mortality Rate per 1000 births	64/7855	8.1
Perinatal Mortality Rate corrected for lethal congenital anomalies (19)	45/7836	5.7
Overall Perinatal Mortality Rate including late neonatal deaths (12)	76/7855	9.7
Overall Perinatal Mortality Rate excluding external referrals (12)	52/7843	6.6
Perinatal Mortality Rate corrected for lethal congenital anomalies (19) and excluding early deaths and stillbirth external referrals (12)	33/7824	4.2

12 Late Neonatal Deaths and 4 Early/Late Infant Deaths

External referrals = 15: 3 anomalies, 12 normally formed

Table 7: Age of Mothers Delivered	Nullip	Multip	Total	%
< 20 yrs	29	3	32	0.4%
20 - 24 yrs	228	93	321	4.2%
25 - 29 yrs	496	349	845	11.0%
30 - 34 yrs	1369	1282	2651	34.5%
35 - 39 yrs	917	2099	3016	39.2%
40 + yrs	222	607	829	10.8%
Total	**3261**	**4433**	**7694**	**100.0%**

Table 8: Parity of Mothers Delivered	Total	%
Para 0	3261	42.4%
Para 1, 2, 3	4322	56.2%
Para 4+	111	1.4%
Total	**7694**	**100.0%**

Table 9: Body Mass Index (WHO ranges)		%
Underweight: <18.5	95	1.2%
Healthy: 18.5 - 24.9	3651	47.5%
Overweight: 25 - 29.9	2120	27.6%
Obese class 1: 30 - 34.9	824	10.7%
Obese class 2: 35 - 39.9	287	3.7%
Obese class 3: >40	117	1.5%
Not Recorded	600	7.8%
Total Deliveries	**7694**	**100.0%**

Table 10: Ethnicity of Mothers Delivered	Total	%
Irish	5283	68.7%
Any other White background	1328	17.3%
Any other Asian background	427	5.5%
Any other Black background	107	1.4%
Other including Mixed Background	145	1.9%
Irish Traveller	21	0.3%
Not Known	383	5.0%
Total Deliveries	**7694**	**100.0%**

Table 11: Birthweight of Babies Born	Nullip	Multip	Total	%
<500g	1	2	3	0.0%
500 - 999g	44	22	66	0.8%
1,000 - 1,499g	24	27	51	0.6%
1,500 - 1,999g	51	44	95	1.2%
2,000 - 2,499g	130	118	248	3.2%
2,500 - 2,999g	411	389	800	10.2%
3,000 - 3,499g	1165	1364	2529	32.2%
3,500 - 3,999g	1082	1680	2762	35.2%
4,000 - 4,499g	369	723	1092	13.9%
4,500 - 4,999g	53	132	185	2.4%
5,000g +	6	18	24	0.3%
	3336	**4519**	**7855**	**100.0%**

Table 12: Sex of Babies Born	Nullip	Multip	Total	%
Male	1764	2325	4089	52.1%
Female	1572	2193	3765	47.9%
Not determined	0	1	1	0.0%
Total Babies Born	**3336**	**4519**	**7855**	**100.0%**

Table 13: Gestational Age of Babies Born	Nullip	Multip	Total	%
< 26 weeks	30	13	43	0.5%
26 - 29 + 6 days	21	25	46	0.6%
30 - 33 + 6 days	64	59	123	1.6%
34 - 36 + 6 days	167	192	359	4.6%
37 - 41 + 6 days	2931	4185	7116	90.6%
42 + weeks	123	45	168	2.1%
Total Babies Born	**3336**	**4519**	**7855**	**100.0%**

Table 13: Perineal Trauma after Spontaneous and Operative Vaginal Delivery (SVD & OVD)	Nullip	Multip	Overall
Episiotomy	1041	337	1378
Incidence % of OVDs	47.7%	10.9%	26.1%
First Degree Tear	205	647	852
Incidence % of OVDs	9.4%	20.9%	16.1%
Second Degree Tear	692	1083	1775
Incidence % of OVDs	31.7%	34.9%	33.6%
Third Degree Tear	48	28	76
Incidence % of OVDs	2.2%	0.9%	1.4%
Fourth Degree Tear	3	2	5
Incidence % of OVDs	0.1%	0.1%	0.1%
Intact	193	1004	1197
Incidence % of OVDs	8.8%	32.4%	22.7%
Total Operative Vaginal Deliveries	**2182**	**3101**	**5283**

Table 13(a): Perineal Trauma after Spontaneous Vaginal Delivery (SVD)			
	Nullip	Multip	Overall
Episiotomy	461	227	688
Incidence % of SVDs	32.1%	7.8%	15.8%
First Degree Tear	183	633	816
Incidence % of SVDs	12.7%	21.7%	18.8%
Second Degree Tear	577	1041	1618
Incidence % of SVDs	40.2%	35.8%	37.2%
Third Degree Tear	24	25	49
Incidence % of SVDs	1.7%	0.9%	1.1%
Fourth Degree Tear	1	2	3
Incidence % of SVDs	0.1%	0.1%	0.1%
Intact	191	983	1174
Incidence % of SVDs	13.3%	33.8%	27.0%
Total Spontaneous Vaginal Deliveries (excl. Operative)	**1437**	**2911**	**4348**

Table 13(b): Perineal Trauma after Operative Vaginal Delivery (OVD)			
	Nullip	Multip	Overall
Episiotomy	580	110	690
Incidence % of OVDs	77.9%	57.9%	73.8%
First Degree Tear	22	14	36
Incidence % of OVDs	3.0%	7.4%	3.9%
Second Degree Tear	115	42	157
Incidence % of OVDs	15.4%	22.1%	16.8%
Third Degree Tear	24	3	27
Incidence % of OVDs	3.2%	1.6%	2.9%
Fourth Degree Tear	2	0	2
Incidence % of OVDs	0.3%	0.0%	0.2%
Intact	2	21	23
Incidence % of OVDs	0.3%	11.1%	2.5%
Total Operative Vaginal Deliveries	**745**	**190**	**935**

Table 14: Severe Maternal Morbidity	
	Major SMM only*
Major Obstetric Haemorrhage	18
Renal / Liver Dysfunction	8
Peripartum Hysterectomy	6
Pulmonary Oedema	4
Other (3/4 did not have other SMM)	4
Pulmonary Embolism	3
ICU/CCU admission	3
Uterine Rupture	1
Cerebral Vascular Accident	1
Septic Shock	1
Anaesthetic Problems	1
Interventional Radiology	1
Eclampsia	0
Acute Respiratory Dysfunction	0
Cardiac Arrest	0
Coma	0
Status Epilepticus	0
Total	**"44 patients 51 SMM events"**

Some women had more than one SMM – in this table only the major SMM is reported

Table 15: Neonatal Encephalopathy		
	Inborn	Outborn
Neonatal Encephalopathy - with HIE	6	2
Neonatal Encephalopathy - no HIE	0	3
Seizures – No Encephalopathy	2	2
Therapeutic Hypothermia	**6**	**5**

PUBLISHED RESEARCH
Articles, Editorials, Letters

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O'Donovan B, Mooney T, Rimmer B, Fitzpatrick P, Flannelly G, Doherty L, Russell N, Martin CM, O'Leary JJ, Sharp L, O'Connor M. Trust and cancer screening: Effects of a screening controversy on women's perceptions of cervical cancer screening. Prev Med Rep. 2021 Dec 27;25:101684. doi: 10.1016/j.pmedr.2021.101684. eCollection 2022 Feb. PMID: 35127361

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MERRION FERTILITY CLINIC

Kovács Z, Glover L, Reidy F, MacSharry J, Saldova R. Novel diagnostic options for endometriosis - Based on the glycome and microbiome. . 2021 Feb 5;33:167-181.
Wallimann T, Hall CHT, Colgan SP, Glover LE. Creatine Supplementation for Patients with Inflammatory Bowel Diseases: A Scientific Rationale for a Clinical Trial. . 2021 Apr 23;13(5):1429.

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Crosby DA, Glover LE, Downey P, Mooney EE, McAuliffe FM, O'Farrelly C, Brennan DJ, Wingfield M. The impact of accurately timed mid-luteal endometrial injury in nulligravid women undergoing their first or second embryo transfer. . 2021 Aug;190(3):1071-1077.

Horan M, Glover L, Wingfield M. Managing endometrioma to optimize future fertility. . 2021 Nov 12.

Schaler L, Wingfield M. COVID-19 vaccine - can it affect fertility? . 2021 Oct 15:1–3.

Hartigan, L, Glover, LE, Wingfield, M. Fertility on ice: an overview of fertility preservation for children and adolescents with cancer. 2021; 23: 170– 176.

Invited Lectures

L Hartigan
Future Fertility for Young People with Cancer
ICLO-NLS (Irish Circle of Lacanian Orientation) Congress 'Wanting a Child? Desire for Family and Clinic of Filiations', April 2021

L Hartigan
Fertility preservation and contraception (before/during/after treatment)
RCPI Acute Medicine Series: Hot Topics in AYA Haemato-Oncology Webinar, August 2021

L Hartigan
Fertility: what are my options?
CAYA Survivor Conference, September 2021

M Wingfield
Ovarian Tissue Cryopreservation and the Childhood Cancer Fertility Project
ESHRE Campus Workshop on Reproductive Tissue Engineering and Fertility Preservation, September 2021

A Giblin
Attitudes of Healthcare Professionals to Draft National Legislation on Assisted Human Reproduction (AHR)
Student Summer Research Awards (SSRA), UCD School of Medicine, October 2021

S O'Brien and L Glover
Science of Fertility
Cavan-Monaghan Science Festival, November 2021

L Glover
Reproductive Immunology
TU MSc Clinical Immunology, November 2021

L Schaler
ERA (endometrial receptivity array) Testing
Sharing Best Practice (SBP) Conference, November 2021

L Hartigan, L Glover, H Groarke, M Wingfield, L O'Shea
Follicular fluid levels of IL-10 influence fertilisation and early embryo development
Fertility 2021, Virtual Conference 6-10 January 2021

F Giangrazia, D Crosby, F Reidy, M Wingfield, L Glover, C O'Farrelly
Dysregulation of IL-17A and calprotectin in the female reproductive tract affects pregnancy outcome following assisted reproductive therapy
Fertility 2021, Virtual Conference 6-10 January 2021

M Horan, L Glover, M Wingfield
Managing fertility in young patients with endometriosis -- how are we doing?
Fertility 2021, Virtual Conference 6-10 January 2021

L Schaler, M Horan, M Wingfield
A review of spontaneous pregnancies and patient behaviour during the first wave of SARS-CoV-2
Fertility 2021, Virtual Conference 6-10 January 2021

F Reidy, L Glover, J Leyden, J Cullinane, M Wingfield
Embryo development in endometriosis: A study of time-lapse imaging
Fertility 2021, Virtual Conference 6-10 January 2021

Z Kovács, Y Xie, B Adamczyk, F Reidy, F Mcauliffe, P Rudd, M Butler, M Wingfield, L Glover, R Saldova
Procainamide fluorescent labeling for identification of low abundant non-invasive glycan biomarkers
Society for Reproductive Investigation (SRI) 68th Annual Meeting, 6-9 July, 2021

D Roche, F Martyn, M Wingfield
Fertility treatment and live birth are still possible following the unexpected diagnosis of endometrial carcinoma/complex hyperplasia - provided that there is careful multidisciplinary team involvement
ESHRE virtual 37th Annual Meeting, 26 June - 1 July, 2021

Z Kovács, B Adamczyk, F Reidy, F McAuliffe, PM Rudd, M Wingfield, L Glover, R Saldova
Novel non-invasive diagnostic options for endometriosis - based on glycome analysis
ESHRE virtual 37th Annual Meeting, 26 June - 1 July, 2021

F Reidy, F Giangrazi, C O'Farrelly, M Wingfield, L Glover
The expression of innate immune factors in the eutopic endometrium of women with Endometriosis
ESHRE virtual 37th Annual Meeting, 26 June - 1 July, 2021

L Schaler, L Glover, M Wingfield
COVID-19: Fertility patients' attitudes to pregnancy and implemented changes within fertility services during a pandemic
ESHRE virtual 37th Annual Meeting, 26 June - 1 July, 2021

M Horan, L Glover, P Downey, M Wingfield
Knowledge of women undergoing surgery for endometrioma regarding the impact of the disease and its treatment on ovarian reserve and fertility.
ESHRE virtual 37th Annual Meeting, 26 June - 1 July, 2021

Procainamide fluorescent labeling for identification of low abundant non-invasive glycan biomarkers
Z Kovács, Y Xie, B Adamczyk, F Reidy, F Mcauliffe, P Rudd, M Butler, M Wingfield, L Glover, R Saldova
21st European Carbohydrate Symposium (Eurocarcb21), 18-22 July, 2021

L Schaler, L Glover, M Wingfield
Covid-19 And Fertility: The Toll on Mental Health
IOG and JOGS Annual Meeting 2021, 26 November 2021

A Giblin, L Schaler, L Glover, M Wingfield
Attitudes of Healthcare Professionals to Draft National Legislation on Assisted Human Reproduction (AHR) In Ireland ()
IOG and JOGS Annual Meeting 2021, 26 November 2021

L Schaler, L Glover, M Wingfield
Male Fertility Patients attitudes to the COVID-19 Vaccine
IOG and JOGS Annual Meeting 2021, 26 November 2021

S O'Brien, L Schaler, L Glover, M Wingfield
Assisted Reproduction: a Luxury for the "Rich" and a Debt Weight for the Poor

IOG and JOGS Annual Meeting 2021, 26 November 2021

MIDWIFERY AND NURSING

Killeen SL, Phillips CM, Delahunt A, Yelverton CA, Shivappa N, Hébert JR, Kennelly MA, Cronin M, Mehegan J, McAuliffe FM. Effect of an Antenatal Lifestyle Intervention on Dietary Inflammatory Index and Its Associations with Maternal and Fetal Outcomes: A Secondary Analysis of the PEARS Trial. Nutrients. 2021 Aug 15;13(8):2798. doi: 10.3390/nu13082798. PMID: 34444958

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NEONATOLOGY AND PAEDIATRICS

Del Rosario C, Slevin M, Molloy EJ, Quigley J, Nixon E. How to use the Bayley Scales of Infant and Toddler Development. Arch Dis Child Educ Pract Ed. 2021 Apr;106(2):108-112. doi: 10.1136/archdischild-2020-319063. PMID: 32859738

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Glennon K, Donnelly J, Knowles S, McAuliffe FM, O'Reilly A, Corcoran S, Walsh J, McMorrow R, Higgins T, Bolger L, Clinton S, O'Riordan S, Start A, Roche D, Bartels H, Malone C, McAuley K, McDermott A, Inzitari R, O'Donnell CPF, Malone F, Higgins S, De Gascun C, Doran P, Brennan DJ. Immunological assessment of SARS-CoV-2 infection in pregnancy from diagnosis to delivery: A multicentre prospective study. PLoS One. 2021 Sep 20;16(9):e0253090. doi: 10.1371/journal.pone.0253090. eCollection 2021. PMID: 34543278

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PATHOLOGY & LABORATORY MEDICINE

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CLINICAL NUTRITION AND DIETETICS

Introduction of a nutrition information group session for parents of babies born preterm, Orla Haughey, Roberta McCarthy – Irish Nutrition and Dietetic Institute Research and Innovation Symposium, April 2021 poster presentation.

Fortification of breast milk for infants born preterm – Review of practices in Irish neonatal units, Roisin Gowan, Roberta McCarthy and Dr Deirdre Sweetman in collaboration with Neonatal Dietitians Ireland – Irish Nutrition and Dietetic Institute Research and Innovation Symposium, April 2021 poster presentation.

Multivitamin supplementation for preterm infants - is it required? Maria Kennedy, Roberta McCarthy Dr Deirdre Sweetman – Irish Nutrition and Dietetic Institute Research and Innovation Symposium, April 2021 poster presentation.

Breast is Best, Let's get to the source for babies born preterm, Roberta McCarthy, Roisín Gowan, Orla Haughey, Dr Eileen O'Brien, Dr Anne Twomey – Irish Nutrition and Dietetic Institute Research and Innovation Symposium, April 2021 poster presentation.

The Hollestic App: Translation of research into practice, Eileen O'Brien, Sinead Curran, Dr Fionnuala McAuliffe – Irish Nutrition and Dietetic Institute Research and Innovation Symposium, April 2021 poster presentation.

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Glossary

ABG	Arterial blood gas
AC	Abdominal circumference
ACA	Anticardiolipin antibodies
ACH	After coming head
aEEG	Amplitude integrated EEG
AFI	Amniotic fluid index
AFV	Amniotic fluid volume
AGA	Appropriate for gestational age
ALT	Alanine aminotransferase
Anaemia	A haemoglobin level of less than 102% g/dl
ANC	Antenatal care
APCR	Activated protein C resistance.
APH	Antepartum haemorrhage Bleeding from the genital tract after 24 weeks gestation
APTT	Activated partial thromboplastin
ARM	Artifical rupture of the membranes to induce labour
ASD	Atrial septal defect
AST	Asparate aminotransferase
AVSD	Atrioventricular septal defect
BBA	Born before admission
BMI	Body mass index
BMV	Bag and Mask Ventilation
BPP	Biophysical profile
BP	Blood pressure
BPD	Biparietel diameter
BPD	Bronchopulmonary dysplasia
BPP	Bio physical profile
BSO	Bilateral salpingo oophorectomy
CCAM	Congenital cystic adenomatoid malformation
CHD	Congenital heart defect
CIN	Cervical intraepithelial neoplasia
CK	Creatine kinase
CLD	Chronic lung disease
CMV	Cytomegalovirus
CPAP	Continuous positive airway pressure
CPC	Choroid plexus cysts
CPD	Cephalopelvic disproportion
CPG	Capilliary blood gas
CPR	Cardiopulmonary resuscitation
CRP	C reactive protein
CSA	Childhood sexual abuse
CSF	Cerebro spinal fluid
CT	Computerised axial tomography
CTG	Cardiotocograph
CTPA	Computed tomography pulmonary angiogram
CVP	Central venous pressure
CVS	Cardiovascular system
CXR	Chest x-ray
D Day	
DCH	Diffuse chorioamnionic haemosiderosis
D/C	Dilatation and curettage
DIC	Disseminated intravascular coagulation
DNA	Did not attend
Domino	Domicillary In Out
DR	Delivery room
DTR	Deep tendon reflex
DVT	Deep vein thrombosis
DWI	Diffusion-weighted images
EBL	Estimated blood loss
Echo	Echocardiogram
ECHO	Extracorpeal membrane oxygenation
ECV	External cephalic version
EDF	Enddiastolic flow
EDV	Enddiastolic volume
EFM	Electronic fetal monitoring
EFW	Estimated fetal birth weight
ELBW	Extremely low birth weight
ET	Endotracheal
ETT	Endotracheal tube
EUA	Examination under anaesthetic
FBS	Fetal blood sampling
FD	Fetal distress
FFP	Fresh frozen plasma
FHH/NH	Fetal heart heard/not heard
FIR	Fetal inflammatory response
FM	Fetal movements
FMF	Fetal movement felt
FMNF	Fetal movements not felt
FSE	Fetal Scalp Electrode
FTA	Failure to advance
FTND	Full term normal delivery
FVM	Fetal Vascular Malperfusion
G and M	Grossly and microscopically
GA	General anaesthetic
GAD	Gestation at delivery
GBS	Group B Streptococcus
GCT	Glucose Challenge Test
GDM	Gestational diabetes mellitus
GIS	Gastrointestinal system
GP	General practitioner
GTT	Glucose tolerance test
GUS	Genitourinary system
Hb	Haemoglobin g/dl
HCG	Human chorionic gonadotrophin
HELLP	Haemolysis elevated liver enzymes low platelets
HFO	High frequency oscillation
HR	Heart rate
Hrs	Hours
HRT	Hormone replacement therapy

HSV	Herpes simplex virus
HVS	High Vaginal Swab
IA	Intermittent auscultation
IDDM	Insulin dependent diabetes mellitus
IHCP	Intrahepatic cholestasis of pregnancy
IMB	Intramenstrual bleeding
IMV	Intermittent mandatory ventilation
INR	International normalised ratio
IOL	Induction of labour
IPP	Intermittent positive pressure
IPPV	Intermittent positive pressure ventilation
ITP	Idiopathic thrombocytopenic purpura
IUCD	Intrauterine contraceptive device
IUD	Intrauterine death
IUGR	Intrauterine growth retardation
IUI	Intra uterine insemination
IUT	Intrauterine transfusion
IVDA	Intravenous drug abuser
IVH	Intra ventricular haemorrhage
IVIG	Intravenous immunoglobulin
L/S	Lecithin/Sphingomyelin
LA	Lupus anticoagulant
LBI	Liveborn infant
LDV	Lactate dehydrogenase
LFD	Large for dates
LFT	Liver function test
LGA	Large for dates
LLETZ	Large loop exision of transformation zone
LMP	Last menstrual period
LMWH	Low molecular weight heparin
LP	Lumbar Puncture
LSCS	Lower segment caesarean section
LSR	Lecithin/sphingomyelin ratio
LUS	Lower uterine scar
LVH	Left ventricular hypertrophy
LVS	Low vaginal swab
MCA	Middle cerebral artery
Mins	Minutes
MIR	Maternal inflammatory response
MRA	Magnetic resonance angiogram
MRI	Magnetic resonance imaging
MROP	Manual removal of placenta
MSU	Mid-stream urinalysis
MSV	Mauriceau smellie veit
MVM	Maternal Vascular Malperfusion
ND	Normal delivery
NEC	Necrotising enterocolitis
NED	No evidence of disease
NER	Neonatal encephalopathy register
NICU	Neonatal intensive care unit
NIPPV	Nasal intermittent positive pressure ventilation
NND	Neonatal death
NO	Nitric oxide
NPO	nil by mouth
N/R	Not recorded
NRCTG	Non reassuring CTG
NS	Normal saline
NSAPH	Non substantial antepartum haemorrhage
NST	Non stress test
NT	Nuchal translucency
NTD	Neural tube defect
OCP	Oral contraceptice pill
OHSS	Ovarian hyperstimulation syndrome
OP	Occipital Posterior
PCB	Post coital bleeding
PCOS	Polycystic ovary syndrome
PCR	Polymerase chain reaction
PDA	Patent ductus arteriosis
PE	Pulmonary embolism
PET	Pre-eclamptic toxaemia
PFA	Plain film of the abdomen
PFC	Persistent fetal circulation
PFO	Patent foramen ovale
PGA	Post gestational age
PIE	Pulmonary interstitial emphysema
PLIC	Posterior limb of the internal capsule
PMB	Post menopausal bleeding
PNW	Postnatal ward
POM	Puncture of membranes to accelerate labour
POP	Persistent occipito posterior position
PPH	Post partum haemorrhage
PPHN	Persistent pulmonary hypertension
PPROM	Preterm pre-labour rupture membranes
PR	Pulmonary regurgitation
PROM	Preterm rupture of membranes
PTX	Pneumothorax
PVL	Periventricular leucomalacia
RBC	Red blood cell
RCC	Red cell concentrate
RDS	Respiratory distress syndrome
RLF	Retrolental fibroplasia
RPOC	Residual products of conception
RS	Respiratory system
RV	Right ventricle
RVH	Right ventricular hypertrophy
SA	Spinal analgesia
SBI	Stillborn infant
SCBU	Special care baby unit
SFD	Small for dates
SFD	Suspected fetal distress
SG	Social group
SGA	Small for gestational age
SIADH	Syndrome of inappropriate ADH secretion
SIDS	Sudden infant death syndrome

SIMV	Synchronized intermittent mandatory ventilation
SMR	Standardised mortality rate
SROM	Spontaneous rupture of membranes
SUA	Single umbilical artery
SVC	Superior vena cava
SVD	Spontaneous vaginal delivery
TAH	Total abdominal hysterectomy
TAH & BSO	Total abdominal hysterectomy and bilateral salpingoopherectomy
TAPVD	Total anomalous pulmonary venous drainage
TAS	Thoracamniotic shunt
TC	True conjugate
TDS	Three times a day
TICH	Traumatic intracranial haemorrhage
TLD	Therapeutic loop diathermy
TOF	Tracheo oesophageal fistula
TR	Tricuspid regurgitation
TTN	Transient tachypnoea of the newborn
TTT	Twin to twin transfusion
TVT	Tension-free vaginal tape
U/S	Ultrasound
UA	Umbilical artery
USS	Ultrasound scan
UTI	Urinary tract infection
VAIN	Vaginal intraepithelial neoplasia
VBG	Venous blood gas
VIN	Vulval intraepithelial neoplasia
VLBW	Very low birthweight
VOD	Vermont oxford database
VON	Vermont oxford network
VP	Ventriculoperitoneal
VSD	Ventricular septal defect
Vx	Vertex
WCC	White cell count
XRP	X-ray pelvimetry

CANDIDACY CHECKLIST FOR NEONATAL THERAPEUTIC HYPOTHERMIA (COOLING)

PATIENT'S NAME: _____ **HOSP. NO:** _____

TIME of BIRTH: _____:_____ hrs. **CURRENT AGE in hours /minutes:** _____ hrs._____ mins.

If current age is greater than 6 hours, call tertiary cooling centre before proceeding.

Directions for the use of this checklist: Start at the top and work through each numbered component. When directed to proceed to the exam, refer to the exam found on page 2. If there is missing data,(such as a known perinatal event and / or Apgar scores) and you are in doubt as to whether or not the patient qualifies for cooling, consult with the tertiary cooling centre promptly to discuss the patient.

**Note: If patient is < 6 hours old and meets the gestation, weight and blood gas criteria and has a witnessed seizure, patient is eligible for 'COOLING' regardless of additional exam findings. Consult the tertiary cooling centre to discuss any questions or concerns.*

Clinical Information	Criteria *(place a tick in the box that corresponds to the patient information)*	Instructions
Gestation	1 ≥ 36 weeks gestation ☐	Go to ⇛ 2 **Weight**
	= 35 weeks gestation ☐	May not be eligible *Contact cooling centre*
	< 35wks gestation ☐	Not Eligible
Weight	2 ≥ 1800 grams ☐	Go to ⇛ 3 **Blood Gas**
	< 1800 grams ☐	Not Eligible
Blood Gas pH = _____ Base Excess = _____ Source: Cord ☐ *Or* 1st infant blood gas at <1hour of life ☐ Arterial ☐ Capillary ☐ Venous Time Obtained: _____ : _____	3 pH < 7.0 *or* Base excess ≥ -16 ☐	Criteria met thus far. Go to **EXAM***
	No gas obtained ☐ *or* pH 7.0 to 7.15 ☐ *or* Base excess -10 to -15.9 ☐	Go to ⇛ 4 **History of acute perinatal event**
	pH >7.15 or Base Excess < 10 ☐	May not be eligible; Go to ⇛ 4 **History of acute perinatal event**
Acute Perinatal Event *(tick all that apply)*	4 Variable / late foetal HR decelerations ☐ Prolapsed / ruptured / tight nuchal cord ☐ Uterine Rupture ☐ Maternal haemorrhage / placental abruption ☐ Maternal trauma (eg. vehicle accident) ☐ Mother received CPR ☐	Any ticked, Go to ⇛ 5 **Apgar score**
	No perinatal event *or* Indeterminate what the event was because of home birth or missing information	May not be eligible; Go to ⇛ 5 **Apgar score**
Apgar Score at 1 minute _____ 5 minute _____ 10 minute _____	5 Apgar ≤ 5 at 10 minutes (yes) ☐	Criteria met thus far. Go to **EXAM***
	Apgar ≤ 5 at 10 minutes (no) ☐ *(no, was 6 or greater at 10 minutes)*	Go to ⇛ 6 **Resuscitation after delivery**
Resuscitation after Delivery *(tick all that apply)* _____ PPV/intubated at 10 minutes _____ CPR _____ Adrenaline administered	6 Continued need for PPV or Intubated at 10 minutes?(yes) ☐	Criteria met thus far. Go to **EXAM***
	PPV/Intubated at 10 minutes?(no) ☐	May not be eligible Go to **EXAM***

This checklist, adapted from the 'STABLE Program', 6th edition, 2013, has been produced by the National Neonatal Transport Programme (NNTP) and endorsed by the Faculty of Paediatrics, Royal College of Physicians, Ireland, in March 2014.

Circle findings for each domain

PATIENT IS ELIGIBLE FOR COOLING WHEN 3 OR MORE DOMAINS HAVE FINDINGS IN COLUMNS 2 OR 3

Domain	1	2	3
Seizures	**None**	**Seizures common:** (focal or multifocal seizures) (Multifocal: clinical activity involving > one site which is asynchronous and usually migratory) Note: If the patient is < 6 hours old and meets the gestation, weight and blood gas criteria and has a witnessed seizure, patient is eligible for cooling regardless of the rest of this exam	**Seizures uncommon:** (excluding decerebration) ***Or*** Frequent seizures
Level of Consciousness	**Normal** **or** **Hyperalert**	***Lethargic*** Decreased activity in an infant who is aroused and responsive **Definition of Lethargic:** • Sleeps excessively with occasional spontaneous eye opening • Responses are delayed but complete • Threshold for eliciting such responses increased • Can be irritable when disturbed	**Stuporous / Comatose** Demonstrates no spontaneous eye opening and is difficult to arouse with external stimuli **Definition of Stuporous:** • Aroused only with vigorous and continuous stimulation **Definition of Comatose:** • No eye opening or response to vigorous stimulation In both stupor and / or coma, the infant may respond to stimulation by grimacing / stereotyped withdrawal / decerebrate posture
Spontaneous activity when awake or aroused	**Active** **Vigorous, doesn't stay in one position**	**Less than active, not vigorous**	**No activity whatsoever**
Posture	**Moving around and does not maintain only one position**	**Distal flexion, complete extension or "frog-legged" position** Term infants with HIE often exhibit • Weakness in hip-shoulder distribution (eg proximal part of extremities) • Distal joints, fingers and toes often exhibit strong flexion • Thumbs strongly flexed and adducted. • Wrists often flexed • Above postures are enhanced by any stimulation	**Decerebrate with or without stimulation (all extremities extended)**
Tone	**Normal** • Resists passive motion **Hypertonic, jittery** • Lowered threshold to all types of minimal stimuli eg light touch, sudden noises • Infant may even respond to his/her own sudden movements	**Hypotonic or floppy,** • Axial hypotonia (ie. head lag) and/or limb hypotonia	**Completely flaccid like a rag doll**
Primitive reflexes	***Suck:*** Vigorously sucks finger or ETT ***Moro:*** Normal: Limb extension followed by flexion with stimulus	***Suck:*** Weak ***Moro:*** Incomplete	***Suck:*** Completely absent ***Moro:*** Completely absent
Autonomic system	***General Activation of Sympathetic nervous system*** ***Pupils:*** • Normal size (-1/3 of iris diameter) • Reactive to Light ***Heart Rate:*** • Normal, > 100bpm ***Respirations:*** • Regular spontaneous breathing	***General Activation of Parasympathetic nervous system*** ***Pupils:*** • Constricted (< 3mm estimated) • but reactive to light ***Heart Rate:*** • Bradycardia (< 100bpm, variable up to 120) ***Respirations:*** • Periodic, irregular breathing effort • Often have more copious secretions and require frequent suctioning	***Pupils:*** • Skew gaze, fixed, dilated, • not reactive to light ***Heart Rate:*** • Variable, inconsistent heart rate, irregular, may be bradycardic ***Respirations:*** • Completely apnoeic, requiring PPV & / or ET intubation and ventilation

Neurological Exam to evaluate candidacy for cooling: If in doubt as to whether patient qualifies for cooling, consult with the cooling centre promptly to discuss the patient.

Senior Members of Staff

RESIDENT AND VISITING MEDICAL STAFF

Master
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Dr Cathy Allen
Dr Venita Broderick
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Dr Myra Fitzpatrick
Dr Grainne Flannelly
Dr Lucia Hartigan (*from Feb*)
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Dr Zara Fonseca-Kelly
Dr Eithne Linnane
Dr Rhona Mahony
Dr Fiona Martyn
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Dr Anne Twomey

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Dr Ingrid Browne
Dr Larry Crowley
Dr Kirk Levins
Dr Siobhan McGuinness
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Dr Roger McMorrow

Consultant Perinatal Psychiatrist
Prof Anthony McCarthy

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Department Lead: Dr Gabrielle C. Colleran
Dr Ian Robinson

Opthalmologist
Dr Michael O'Keeffe

Consultant Geneticist
Dr William Reardon

Consultant Clinical and Biochemical Geneticist
Dr Samantha Doyle

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Endocrinologist
Prof Mensud Hatunic

Physician in Chemotherapeutic Medicine
Dr David Fennelly

Adult Nephrology
Prof Alan Watson
Dr John Holian

Occupational Physician
Dr Sheelagh O Brien

Microbiology
Dr Niamh O'Sullivan

Anatomical Pathology
Dr Peter Kelehan

Gastroenterology
Dr Juliette Sheridan
Prof Hugh E Mulcahy

Surgeons
Mr Enda McDermott
Mr Feargal Quinn

Oto-Rhino-Laryngologist (ENT Surgeon)
Mr Alex Blayney

Paediatric Urological Surgeon
Mr John Gillick

Urological Surgeons
Mr David Quinlan
Mr Gerry Lennon

Orthopaedic Surgeon
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Prof Karina Butler

Infectious Diseases
Prof Colm Bergin

Chemical Pathology
Dr Pat Twomey

Palliative Medicine
Dr Marie Twomey

Hepatology
Prof Aiden McCormick

Rheumatology
Prof Douglas J Veale
Prof Oliver FitzGerald

Non-Consultant Hospital Doctors
Doctors in this list have spent between 3 and 12 months in The NMH. Some Doctors may appear under more than one heading if they were employed at different levels during the year.

Specialist Registrars/Registrars in Obstetrics/Gynaecology
Dr Maria Farren (SpR) *(Assistant Master) (from Jan)*
Dr Nicola English (Asst Master) (*from Jul*)
Dr Sie Ong Ting (Asst Master) (*from Jul*)
Dr Andrew Downey (SpR)
Dr Ann Rowan (SpR) RCSI Tutor
Dr Barry McDonald (Reg)
Dr Breffini Anglim (SpR)
Dr Breffini Anglim (SpR)
Dr Catherine Windrim (SpR)
Dr Daniel Kane (SpR) UCD Tutor
Dr Danielle Cotter (Reg)
Dr David Rooney (Reg)
Dr Doireann Roche (Reg) (NMH/SMH)
Dr Elzahra Ibrahim (Reg)
Dr Gillian Corbett (SpR)
Dr Irum Farooq (SpR)
Dr Joan Lennon (SpR)
Dr Karen Mulligan (Reg)
Dr Maeve Smyth (SpR)
Dr Mohamed Elshaikh (Reg)
Dr Molly Walsh (Reg) *(NMH/SMH)*
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Dr Nicola O'Riordan (SpR)
Dr Nicola Whelan (Reg)

Dr Rebecca Boughton (Reg)
Dr Ruth Roseingrave (SpR)
Dr Sadhbh Lee (Reg)
Dr Sarah Murphy (Reg)
Dr Sarah Petch (SpR)
Dr Simon Craven (SpR)
Dr Zulfiya Mamaeva (Reg)

Fellows/Research Registrars
Dr Bobby O'Leary, Urogynaecology Research Fellow
Dr Caitriona Ni Chathasaigh, Neonatal Researcher
Dr Carmel Moore, Fellow - Neonatal Haemovigilance and Transfusion
Dr Cathy McNestry, UCD Lecturer (from Sept)
Dr Emma Dunne, Neonatal Research Fellow
Dr Fatimah Al-Shiokh, Urogynaecology Fellow
Dr Fiona O'Toole, Maternal & Fetal Medicine
Dr Gillian Ryan, Maternal & Fetal Medicine
Dr Grace Ryan, Fetal Medicine
Dr Helena Bartels, Placenta Accreta Fellow
Dr Laurentina Schaler, Merrion Fertility Clinic
Dr Maebh Horan, Merrion Fertility Clinic
Dr Maggie O'Brien, Maternal Medicine Fellow
Dr Niamh Keating, Maternal Medicine Fellow
Dr Nicola O'Riordan, Labour Ward Fellow
Dr Rachel Elebert, Merrion Fertility Clinic
Dr Sorca O'Brien, Fellow – Fertility Care

Senior House Officers in Obstetrics/Gynaecology
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Dr Andrew Rowe
Dr Aoife McEvoy
Dr Billy Storan
Dr Blaithin Seery
Dr Brian Creaner
Dr Ciara McArdle
Dr Claudia Condon
Dr Danielle Cotter
Dr Emma O'Carroll
Dr Fiona Fitzpatrick
Dr Gretta Sheridan
Dr Ian Mulvihill
Dr John Flanagan
Dr Karen Mulligan
Dr Kate Sexton
Dr Katie Lydon
Dr Lauren Mulligan
Dr Liam McCrone
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Dr Sarah Kelly
Dr Sarah O'Riordan
Dr Shane Kenny
Dr Susan Clinton
Dr Suzanne Smyth
Dr Tara Fitzgerald
Dr Tess Higgins

Specialist Registrars/Registrars in Neonatology
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Dr Aoife Flynn (SpR)
Dr Atif Kahlil (Reg)
Dr Bazlin Ramly (Reg)
Dr Beth Gordon (SpR)
Dr Caitriona Ni Cathasaigh(SpR)
Dr Elena Nechita (Reg)
Dr Erica Crothers (SpR)
Dr Husnain Mahomed (SpR)
Dr Jason Foran (Reg)
Dr Jonathan Clarke (SpR)
Dr Jsun Loong Wong (Reg)
Dr Karen Kelleher (SpR)
Dr Katie Flinn (SpR)
Dr Kevin Gaughan (SpR)
Dr Lucy Geraghty (SpR)
Dr Miriam Smyth (SpR)
Dr Noemi Pellegrino (Reg)
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Dr Ciara Ryan
Dr Elena Nechita
Dr Emma McLoughlin
Dr Freya Guinness
Dr Gold Amaechi
Dr Grainne Larkin
Dr Karen O'Neill
Dr Neil Collins
Dr Neil Collins
Dr Rachel Barry
Dr Sarah Hoolahan
Dr Sinead Cunningham
Dr Sinead Lally
Dr Siti Aisyah Mohd Ramli
Dr Tiarnán Fallon Verbruggen
Dr Valerie Tsang

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Dr Ayat Alzaher (Fellow)
Dr Barry Singleton (SpR)
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Dr Dominika Karlicka (Reg)
Dr Eihab Elshabrawy (Reg)
Dr Gerard Cotter (Reg)

Dr Jaco Malan (Fellow)
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Dr Jane O'Sullivan (SpR)
Dr Jawad Matanis (Fellow)
Dr Kashif Rauf (Reg)
Dr Mahmoud Mohamed (Reg)
Dr Manuela Andreea Afrasinei (SpR)
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Shideh Kiafar

Assistant Directors of Midwifery & Nursing – Night Duty
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Eimir Guinan
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Advanced Midwife / Nurse Practitioners
Anitha Baby, Triage Services
Caroline Brophy, Assisted Care
Ciara Coveney, Diabetes
Linda Kelly, Women's Health & Urodynamics
Shirley Moore, Neonatology

Candidate Midwife / Nurse Practitioner
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Clinical Midwife / Nurse Managers 3
Gillian Canty, Project Team
Martina Cronin, Labour & Birthing Unit
Catríona Cullen, MN- CMS (*Retired Aug*)
Teresa McCreery, Community Midwives
Carol Pugh, Postnatal Services
Karen Sherlock, Theatre and Gynae Inpatient Services
Valerie Spillane, Antenatal Outpatient & Ultrasound Services
Hilda Wall, Neonatal Unit

Clinical Midwife / Nurse Managers 2

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Breid O'Dea

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Antenatal Ward
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Baby Clinic
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Clodagh Craven

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Maria O'Connell

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Lisa Brady

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Postnatal Services
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Colette O'Neill

Neonatal Clinical Skills Facilitator
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Ann Marie Dunne

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Orla Gavigan
Theresa Barry
Elaine Creedon

Haemovigilance Officer
Bridget Carew

Nurse Colposcopists
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Dympna Casey
Hazel Catibog
Marie Collery
Natasha Farron Mahon
Siobhan Griffin
Lisa Hughes
Sinead Kausley
Deirdre O'Neill

Smoking Cessation
Orla Bowe

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Financial Controller
Alistair Holland

IT Manager
Con Grimes (Acting)

Human Resources Manager
Yvonne Connolly

General Services Manager
Tony Thompson

Purchasing and Supplies Managers
Linda Mulligan and Lorraine McLoughlin

Patient Services Manager
Alan McNamara

Information Officer
Fionnuala Byrne

Health & Safety Officer
Martin Creagh

Facilities Engineering Manager
Neil Farrington

Tendering Officer
Gwen Montague

Compliance and Operations Manager/Data Protection Officer (Acting)
Carl Alfvag

Quality, Risk and Patient Safety

Director of Quality, Risk and Patient Safety
Luke Feeney

Claims Coordinator
Nicole Kennedy

Quality Manager
Rachel Irwin

Clinical Risk
Clare O'Dwyer
Laurence Rousseill

Project Programme Office to NMH at Elm Park
Dr Orla Sheil, Joint Clinical Lead
Dr Jenny Walsh, Joint Clinical Lead and Joint Chair, Digital Health Steering Group
Martin Keane, Project ICT Lead
Damian McKeown,Project Co-Ordinator
Eoghan Hayden, Commissioning & Transitioning Pillar Lead
Emmett Travers, Operations & Business Enablement Pillar Lead
Gillian Canty, Operational Readiness Deputy Lead
Martin Creagh, Co-location Deputy Lead
Geraldine Duffy, People Pillar Lead
Sarah McCourt, Administrator

ALLIED HEALTH PROFESSIONALS

Head Medical Social Worker
Kaylene Jackson (*to Jul*)
Laura Harrington (*from Jul*)

Senior Medical Social Worker
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Sinead Stakelum
Karen McCormack
Adele Kane (Perinatal Mental Health)
Ciara Buggy
Doireann Kavanagh (*from Jun)*
Ryan Cassidy (*from Oct*)

Medical Social Worker
Gillian McMurray
Aoife Shannon
Saoirse Bolger

Radiography
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Senior Radiographer
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Bernadette Ryan
Carmel O'Connor
Erica Maughan
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Elga Grimes
Carla Groves
Clara Nolan
Laura Moyles
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Physiotherapy Manager
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Senior Physiotherapist
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Laura O'Sullivan (Obs)
Sarah Fitzmaurice (Obs)
Eithne Lennon (Neo)
Sarah Mullins (Gyn)
Ciara Ryan(Gyn)
Aoife Magner (Obs)

Clinical Specialist Physio
Jo Egan (Neo)
Aoife Cullen (Gyn)

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Laboratory Manager
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Chief Medical Scientist
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Anya Curry
Catherine Doughty
Natalie Keogh
Paula Whyte
Luke Mac Keogh (*Retired Sept)*

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Mr Damian Lally

Senior Medical Scientist
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Padraig McGarry (*to Mar*)
Laura Kennedy
Norbert Clarke
Declan Ryan
Philip Clarke
Deirdre Duggan
Donal Noonan
David Mahon
Aoife Reynolds
Gwen Connolly

Central Decontamination Unit
Pam Hutchings

Chief Pharmacist
David Fitzgerald

Senior Pharmacist Medication Safety/MN-CMS
Aine Toher

Senior Pharmacist Maternal Medicines Clinic
Anne Clohessy (*to Aug*)
Benedetta Soldati *(from Aug)*

Senior Pharmacist NICU
Montserrat Corderroura,

Antimicrobial Pharmacist
Louise Delany

Senior Pharmaceutical Technicians
Linda Simpson
Rosie Kirwan *(from Dec)*

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Psychosexual Counsellor
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Eimear Ryan (*from Feb*)

Chief Clinical Engineer
Eoghan Hayden

Senior Clinical Engineer
Maighread Gallagher
Vasanth Pillai
Dara Keeley (*to Oct*)
Oleg Shrolik (*from Nov)*

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Clinical Psychologist, Perinatal Mental Health
Aoife Menton

Sonographer
Erica Maughan

SENIOR SUPPORT SERVICES

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Assistant Portering Services Manager
Glenn Kynes

Hygiene Services Manager
Mark Anderson

Catering
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Beata Banach
Gillian McKeown (*to Apr*)
Martina Guiney
Paul Humphreys
Marta Jankowska

Engineering
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James McGovern, Maintenance Supervisor
Gearoid O Toole, In-House Build Team Supervisor
Graham Tucker, Draughtsman Technician
Bozena Wrobel- Paprota, Engineering Services Coordinator (*from Dec*)
Tatjana Bokanova, Engineering Administrator

Chaplaincy
Helen Miley
Angela Neville Egan

Definitions

Approach to Data Presentation in Clinical Report
Presentation of data in the individual cases is now recorded in tabular form. An explanation of placental terminology is provided in appendix 1. Individual cases are categorised according to the disease process that caused death. Many cases will have multiple pathologies and multiple potential causes of death, and the sequence leading to these is given in the final (diagnostic) line.

The approach taken in cases with potentially competing causes of death is that analysis of this data enables calculation of hospital mortality in infants without a lethal or potentially lethal congenital anomaly.

IUGR can be variously applied to infants at the 3rd, 5th or 10th centiles. The third centile is the one shown to correlate best with perinatal mortality. The reference ranges for centiles given in this report are those published by the Child Growth Foundation (UK) (updated 2002).

Maternal death: Death of a patient, booked or unbooked, for whom the hospital has accepted responsibility, during pregnancy or within six weeks of delivery whether in the hospital or not.

Stillborn infant: A baby with birthweight greater than or equal to 500g, who shows no signs of life at delivery.

Early neonatal death: A baby born alive with birthweight greater than or equal to 500g, who dies within 7 days.

Perinatal mortality rate: The sum of stillbirths and early neonatal deaths per 1,000 total births whose birthweight is greater than or equal to 500g.

Corrected perinatal mortality rate: The sum of stillbirths and early neonatal deaths per 1,000 total births whose birthweight is greater than or equal to 500g excluding congential anomalies.

Gestation: The best estimate is the duration of gestation using the first day of the last normal menstrual period and early ultrasound as appropriate in the clinical circumstances.

Preterm: Less than 37 completed weeks.

Postdates: 42 weeks or greater.

Prolonged labour: Labour more than 12 hours - nulliparous.

Labour length: Duration of time spent in the labour ward.

Blood Gases: Capillary, Arterial and Venous Blood gases given in order pH, Partial Pressure of Oxygen (PO_2), Partial Pressure of Carbon (PCO_2) and Base Excess (BE).

PATHOLOGY

Thrombophilia screen
Prothrombin Time, INR, APTT, Thrombin Time, Fibrinogen, Lupus Anticoaguloant screen - (Lupus anticoagulant, anti-cardiolipin antibodies, beta-2 glycoprotein 1 antibody), Anti Thrombin Three, Protein C, Protein S Free, Modified APCR (FVLeiden mutation if appropriate).

Postmortem
The perinatal autopsy involves external examination of body, with appropriate photographs and X-ray. Internal examination includes inspection of cranial, thoracic and abdominal cavities with removal and weighing of organs: organs are retuned to the body before release. Samples are taken for subsequent processing and histologic examination. Extent of sampling of tissue such as spinal cord, nerve and muscle depends on clinical details and on the extent of maceration. The autopsy includes swabs for culture from body cavities and washings for virology. Tissue is frozen for fat stains and may be used for assessment of metabolites. Cytogenetic analysis and where indicated, microarray, may be performed on ether skin or placental tissue. The placenta is reported in conjunction with the autopsy, and maternal blood results are also evaluated in reaching a diagnosis. The quality of the report is benchmarked against standards set in the Faculty of Pathology, RCPI QA/QI programme.

A provisional anatomic diagnosis is issued within two working days (except in Coroner's cases, where it is not issued), and the final report is usually within 8 weeks. Occasional cases take longer due to complexity and/or the necessity for external consultations.

Placental pathology

A triage system is in place for placental examination. The entire placenta is submitted to the laboratory:

a) from cases of Caesarean section
b) from cases born in the delivery ward, where there is an abnormality of pregnancy, labour, delivery or the neonatal period.

In other cases, the placenta is kept refrigerated for seven days and retrieved if an indication for analysis becomes apparent.

Data from analysis of cases of Perinatal morbidity or mortality is returned in an anonymised fashion to the National Perinatal Epidemiology Centre, UCC, where it is pooled with data from other maternity units and national trends and benchmarks are published. The terminology used is the same consensus terminology as that used by NPEC (Khong TY et al). Some of these terms are expanded on below.

Maternal vascular malperfusion (MVM)

This is a spectrum: at the less severe end is mild accelerated villous maturation, then ischemic villous crowding and latterly infarction, also referred to as uteroplacental insufficiency (UPI). Increasingly, terms such as "shallow implantation" are being used to explain the pathogenesis. Expected findings in a case of severe PET would be a small placenta with recent and old infarcts, located centrally and peripherally in the parenchyma. Atherosis is fibrinoid change in vessels, seen in about half of cases of PET and occasionally in other conditions eg connective tissue disease.

Hypoxic membrane lesions

Laminar decidual necrosis may be regarded as an acute hypoxic lesion, and microcystic change in the chorion as a chronic hypoxic lesion.

Meconium

When present in large quantities, meconium may cause necrosis of muscle cells in the walls of chorionic vessels and possibly lead to vasospasm and ischaemia.

Chorangiosis

More vessels than normal are seen in terminal villi. It may be present as a primary finding or as a reaction where adjacent villi have been destroyed by villitis, and is suggested to be a marker of chronic hypoxia.

PATTERNS OF INFLAMMATION

Chorioamnionitis

The terms "maternal inflammatory response" and "fetal inflammatory response are used with each being staged and graded according to consensus guidelines. There is an association between a severe fetal inflammatory response and brain damage in both term and pre-term infants.

Maternal-fetal immune interaction.

This may be manifest as any or all of villitis, intervillositis, chronic chorioamnionitis and deciduitis.

Villitis

Rare cases of villitis are due to infection eg CMV, but most are of unknown aetiology and are immunologically mediated. Villitis is graded as low-grade or high-grade. Overall, villitis is seen in 10% of placentas; high-grade villitis occurs in < 2% and is associated with an adverse perinatal outcome. Villitis may cause damage to fetal vessels in the placenta and this is associated with neurologic damage in term infants. It may recur in subsequent pregnancies.

Intervillositis

Chronic histiocytic intervillositis is relatively rare, but is over-represented in the cases in this report. It is associated with growth restriction and perinatal loss, with a mean gestation of loss of 25/40. It is more common in patients with immune dysregulation, and is likely to recur in subsequent pregnancies.

THROMBOSIS AND HAEMORRHAGE

Fetal vascular malperfusion (FVM)

Occlusions of the fetoplacental circulation are manifest by: extensive avascular villi, obliterated stem arteries, haemorrhagic villitis, and occlusive thrombi. The term fetal thrombotic vasculopathy is also used. High-grade FVM, in particular, is associated with neonatal encephalopathy.

Non-occlusive mural fibrin thrombi

These are found in large fetal vessels in approx 10% of placentas. They are more common in cases with FTV and abnormal coiling; they reflect impaired fetoplacental flow, but the significance of isolated ones in smaller stem vessels is at present unclear.

Cord coiling

The cord normally has one coil per 5cm. Both hypo-

and hypercoiled cords are associated with IUGR, fetal death, cord stricture, thrombosis and an abnormal response to labour.

Abruption and retroplacental haemorrhage (RPH)
RPH may be identified on pathologic examination of the placenta, but have been clinically silent. Conversely, dramatic clinical abruption may leave no changes in the placenta. In many cases RPH causes compression infarction of the placenta.

Diffuse chorioamniotic haemosiderosis (DCH)
This is diagnosed by the presence of haemosiderin-laden macrophages in the membranes and/or chorionic plate. Such placentas are more likely to show circumvallation, old peripheral blood clots and green discoloration. Clinically, DCH is associated with chronic vaginal bleeding, multiparity and smoking. Blood and breakdown products are released into the amniotic fluid. Oligohydramnios, IUGR and a lower gestational age at delivery have been found more commonly in cases with DCH. Persistent pulmonary hypertension and dry lung syndrome are more common in these neonates. DCH may represent chronic peripheral separation of the placenta, possibly from marginal venous bleeding (rather than the arterial bleed of abruption).

ABNORMAL PLACENTAL DEVELOPMENT

Delayed/abnormal villous maturation
This is where the placenta has failed to develop appropriately for gestational age, partially or completely. It is a poorly understood entity, and is associated with diabetes. It is associated with an increased risk of stillbirth. Some cases may receive a descriptive diagnosis eg abnormal maturation or variable villous maturation where there is a mixed picture, with some areas showing delayed maturation and other areas accelerated maturation. The term "distal villous immaturity" is also used.

Increased perivillous fibrin
Localised increases in fibrin are common, but a diffuse increase, sometimes in a pattern called "maternal floor infarction" is associated with an adverse outcome.

Placental weight
In general, the term placenta weighs between one sixth and one seventh of the infant's weight, but a wide range of placental weights is seen in normal infants. The weight is given in the cases discussed where it is felt to be markedly abnormal. Fetoplacental weight ratio (median of around 7 at term) are sometimes used. Updated September 2018

Khong T Yee, Mooney EE, Ariel I et al. Sampling and definition of placental lesions. Amsterdam Placental Workshop Group Consensus Statement. Arch Pathol Lab Med 2016;140:698-713.

Appendix 2: Classification of indications for caesarean section in spontaneous labour or after having had labour induced

Fetal reason
Caesarean section for fetal indication before any oxytocin has been given.

Dystocia

Inefficient uterine action/inability to treat/fetal intolerance
Problem is inadequate progress with no fetal problems until oxytocin is started.

Inefficient uterine action/inability to treat/overcontracting
Problem is inadequate progress but oxytocin does not reach maximum dose as per protocol in unit because of overcontracting uterus.

Inefficient uterine action/poor response
Problem is inadequate progress which does not improve after being treated with the maximum dose of oxytocin according to the protocol in the unit.

Inefficient uterine action/no oxytocin
Problem is inadequate progress which for whatever reason has not been treated with oxytocin.

Efficient uterine action/CPD/POP*
Adequate progress (1cm/hr) and in nulliparous women would need to have been treated with oxytocin) but vaginal delivery not possible.
*In multiparous women the term CPD/POP is replaced with obstructed labour.

CLASSIFICATION OF INDICATIONS FOR INDUCTIONS OF LABOUR

Fetal reasons
Includes all indications for induction that are carried out for the benefit of the fetus.

PET/Hypertension
Includes all indications for induction that are carried out for hypertensive disorders.

Post Dates
Includes all inductions that are carried out specifically for 42 weeks gestation or greater.

SROM
Includes all inductions for spontaneous rupture of the membranes

Maternal reasons/Pains
Includes all indications for induction that are carried out for the benefit of the mother including pains not in labour

Non medical reasons/Dates< 42 weeks
Includes all indications for inductions where there is no absolute medical indication or for dates but less than 42 weeks

The National Maternity Hospital Annual Report 2021

Photography in the Report

Images in the report are from a mix of press releases, the new NMHNICU website, the NMH Staff Newsletter and photos staff and families have allowed us use and we are grateful to have them all.

COVID-19 guidelines were adhered to during the various stages of the pandemic.

Print & Design
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Project Managed by Fionnuala Byrne, Information Officer

The NMH Foundation exists to raise vital funds for the National Maternity Hospital, with a focus on advancing maternal and neonatal health in Ireland. We raise vital funds to invest in research, to provide vital equipment and technology within the hospital, and to support the work of the care teams and support services caring for mothers and tiny babies. The NMH Foundation is helping babies to arrive, survive and thrive.

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CRA 20080891 | CHY 20389