

Mater
Misericordiae
University
Hospital



Annual Report
2019

Working in partnership with



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About Us

Mater Misericordiae University Hospital

The Mater Misericordiae University Hospital is a level 4 teaching hospital based in Dublin's north inner city. The hospital was opened in 1861 by the Sisters of Mercy. The Mater is part of the Ireland East Hospital Group and provides a range of frontline and specialist services on a regional and national level.

The Mater is a major cardiac centre, cancer centre and is home to a range of quaternary services listed below. While the hospital has been synonymous with cardiology it also is a major centre for ophthalmology, spinal injuries, gynaecological cancer and is the national heart and lung transplantation centre.

As a major academic hospital the Mater has a strong track record of producing high quality research that delivers real and meaningful results to patients. Through our partnerships with our academic partner, University College Dublin (UCD), and other academic institutions, the Mater prioritises research that translates rapidly into patient benefits.

The strong partnership with UCD also enables us to deliver undergraduate and postgraduate education to hundreds of healthcare professionals including nurses, doctors, clinical therapists, radiographers and many more.

Our Ambition

Our ambition is to be the safest hospital in Ireland, delivering the highest quality care, with the most patient centred, efficient processes.

Specialist Services

Quaternary Care Services

- ▶ Cardio-thoracic Surgery
- ▶ National Centre for Peritoneal Malignancies
- ▶ Intensive Care Medicine
- ▶ National Centre for Inherited Metabolic Disorders
- ▶ National Centre for Rare Diseases
- ▶ National Centre for Congenital Heart
- ▶ National Centre for Extra Corporeal Life Support
- ▶ National Heart and Lung Transplantation Programme
- ▶ National Isolation Unit
- ▶ National Spinal Injuries Unit
- ▶ National Centre for Pulmonary Hypertension

Cardiology

- ▶ National Heart and Lung Transplantation Centre
- ▶ Designated primary PCI (percutaneous coronary intervention) centre
- ▶ National Centre for Adult Congenital Heart Disease
- ▶ Major Structural Heart Disease centre
- ▶ Family Heart Screening

Cancer

- ▶ One of the Eight Nationally Designated Cancer Centres
- ▶ One of 4 Nationally Designated Lung Cancer Surgery Centres
- ▶ National Centre for Peritoneal Malignancies
- ▶ BreastCheck located on the Mater Campus

Mission, Vision, Values and Priorities

Our mission at the Mater Misericordiae University Hospital is to care for the sick with compassion and professionalism at all times, to respect the dignity of human life, and to promote excellence, quality and accountability through all our activities.

Our Vision

To be a leader in innovation of specialist services and healthcare transformation with a strong academic and research agenda, demonstrating consistent efficiencies and quality care improvements and delivering excellence in care as perceived by our patients.

Our Values

- ▶ Excellent reputation
- ▶ Competent and motivated staff
- ▶ Education, training and research
- ▶ Clinical excellence
- ▶ Positive patient experience
- ▶ Financial accountability
- ▶ Partnership
- ▶ Strategic planning and development

Our Strategic Goals



Goal 1

Deliver system-wide process improvements in unscheduled and scheduled care

To implement 'whole systems' process improvement in unscheduled and scheduled care, enabled by our Transformation Office/Mater Lean Academy and IT Investment

Goal 2

Strengthen and promote our specialty services and areas of expertise (our DNA)

To focus on the development of our specialty services (with critical care as the hub) and to promote our expertise and outcomes in these areas to all our stakeholders

Goal 3

Enhance our education, research and innovation capability and profile

To strengthen our education, research and innovation profile, secure more academic positions, and participate in more directed research through the new Directorate of Education, Research and Innovation

Goal 4

Ensure effective data capture and reporting (clinical audit / HIPE / ABF)

To establish the necessary technology, processes and structures to ensure we are efficient in our data gathering and reporting, stronger at clinical audit and are maximising activity based funding

Goal 5

Demonstrate leadership and innovation in patient care delivery models, integrated care and staff wellbeing









To challenge the status quo and develop new service delivery models and new services that improve the patient experience, patient outcomes and staff wellbeing

Goal 6

Implement an EHR system

To invest in and implement an Electronic Health Record (EHR) system to facilitate clinical practice and to support the wider business environment

Our Care at a Glance

 84,303 emergency department attendances	 223,508 out-patient attendances
 211,601 radiological investigations / procedures	 2,500+ cancers diagnosed
 73.3% of elective patients admitted on day of surgery	 68,028 day case procedures performed
 330 emergency cardiac cath lab procedures	 53 transplants performed

Board of Directors

Chairman



Thomas Lynch
Chairman

Chief Executive



Alan Sharp
Chief Executive
(from end August 2019)



Gordon Dunne
Chief Executive
(to August 2019)

Executive Members



Prof Padraic MacMathuna
Chairman
Medical Executive



Prof Brendan Kinsley
Executive Clinical
Director



Suzanne Dempsey
Director of Nursing



Brid Cosgrove
Director of Finance

Non-Executive Members



Dr Mary Carmel Burke
General Practice
Representative



Sr Margherita Rock
Sister of Mercy
(RIP July 2019)



Sr Eugene Nolan
Sister of Mercy
(RIP June 2019)



Prof Mary Day
Chief Executive IEHG



Eilis O'Brien
Comms/Marketing
Director UCD



Tony Garry
Company Director



Rod Ensor
Solicitor



David O'Kelly
Advisory Partner
KPMG



Dr Mary McMenamin
Departmental
Lecturer, Oxford



Prof Cecily Kelleher
College Principal

CEO Introduction

At the heart of the Mater Misericordiae University Hospital is a passion to provide the highest quality of care in a compassionate and caring manner. The hospital's focus on excellence and quality demonstrates our commitment to every patient that comes through our doors. While our commitment to research and education underlines our desire to constantly improve the care we provide.

This report is a snapshot of the work of the multiple teams that form the Mater Hospital. The hospital is a provider of quaternary, tertiary and regional care, as well as a range of local services to our catchment area. The national and tertiary specialities we provide include

▶ **National** Cardiac Surgery, Heart and Lung Transplantation, Extra Corporeal Life Support (ECLS), National Spinal Injuries Unit, National Centre for Peritoneal Malignancy, National Centre for Pulmonary Hypertension and the National Isolation Unit

▶ **Tertiary Services** Breast Surgery, Cardiology, Clinical Genetics, Colorectal Surgery, Oncology & Haematology, Ophthalmology and Gynae Oncology

Our ambition at the Mater Hospital is to be the safest hospital in Ireland. Quality and patient safety are the number one priority for everyone that works at the hospital. The Quality and Patient Safety Directorate run a number of programmes that support a constant improvement in the quality of care we deliver. Their focus is on delivering safe, effective and person-centred care in a timely, efficient and equitable way.

Finally, a strong profile in education, research and innovation is central to a major academic hospital in the 21st Century. The hospital has built on the strong foundation with our academic partner University College Dublin to deliver high quality educational and research programmes that train the next generation of clinicians and provide greater access to new medical options for patients.

As you read through the report I hope you will get a sense of the scope of care that we provide, the complexity of the work that we do and our constant desire to improve everything that we do. I am proud of what we have achieved in 2019 and I hope you find this report interesting.

Alan Sharp, Chief Executive

Year in Review

Liver and Double Lung Transplant

Robert Sheahan from Co. Limerick was the first person in Ireland to receive a liver and double lung transplant, thanks to organ donation. The 29-year-old underwent the long and complicated transplantation operation in June 2019. Two surgical transplant teams - one from the Mater Misericordiae University Hospital's National Heart and Lung Unit and the other from St Vincent's University Hospital's (SVUH) National Liver Transplant Unit worked for around ten hours on this life saving operation for Robert.

Mr Emir Hoti, Director of National Liver Transplant Programme at SVUH, who got to work first of all, commented

“ Robert has benefitted the most of any person I've seen or treated for transplant. The fact that this is a first for Ireland shows how far we have come in terms of our transplant programme. The operation itself, while complicated, was a success and our collaboration with the team at the Mater was superb.”

Mr Emir Hoti



Mr Emir Hoti (Consultant Surgeon SVUH), Robert Sheahan and Mr Lars Nolke (Consultant Cardio-thoracic Surgeon, MMUH)

Approximately 15 medical professionals, from anesthesiologists to scrub nurses were involved in the ten hour operation. The operation was a success and a few days later, on his 29th birthday, Robert Sheahan came to in the ICU unit. He spent two months recovering in the Mater before being discharged home, and made weekly visits to the Mater for follow up.

Lord Mayor Award

On Monday 4th March one of the staff nurses at the Mater Hospital, Aoife McGivney, was a passenger on a Dublin bus on her way to work. The bus driver became unwell and subsequently suffered a cardiac arrest. The incident occurred in rush hour traffic and began with the bus running through a red light at O'Connell Bridge. Aoife approached the front of the bus and noticed that the bus driver was unwell. She successfully

managed to access the driver and remove his legs from the pedals. By now the bus driver began to lose consciousness and went into cardiac arrest. Aoife performed life-saving CPR with the assistance of other members of the public and we are delighted to report that the driver regained a pulse, was transferred to the Mater and recovered. Aoife was recognised by the Lord Mayor of Dublin, Nial Ring, in the *2019 Lord Mayor Awards* and was nominated by the Lord Mayor for a National Bravery Award.



Lord Mayor Nial Ring with Aoife McGivney

Compassion Awards 2019

At the Mater Misericordiae University Hospital, we believe that every staff member is key to providing a kind, compassionate and caring service to all patients and their families. The Compassion Awards were set up several years ago by the CEO and the Director of Mission Effectiveness to recognise and acknowledge the great work and outstanding care provided by our staff every day in the hospital.

The Compassion Awards aim to recognise staff members who demonstrate the following

- ▶ Dedication and effort above and beyond the call of duty
- ▶ Going the extra mile in helping patients, visitors and colleagues

▶ Displaying a positive, friendly, caring, courteous, and professional attitude when dealing with patients, visitors and colleagues

▶ Honouring the Mater Hospital's motto *Maintain an attitude of tenderness, empathy and respect*

Winner: David Nethaway, (HCA in St Vincent's Ward) with Siobhan Brady (external adjudicator)



This year we received a total of 120 nominations from across all disciplines within the hospital. The award ceremony took place in the Freeman Auditorium

The winning nominees were

▶ **1st Place** David Nethaway, HCA, St Vincent's Ward

▶ **2nd Place** Adrienne Meehan, Administration Cath Lab

▶ **3rd Place** Eoin Hunt, NCHD, Lung Transplantation

▶ **4th Place** Mairead Fewer, Administration Respiratory

Special Commendation was given to the following staff

▶ Maura Gallagher, Nursing

▶ Rachel Kelly, Social Worker

▶ Jess Kenny, Nursing

▶ Carmel Rochford, Household

▶ Niamh Salter, St. Pauls Management Team

Stop the Clot Bus

From the 12th September to the 11th October a *Stop the Clot* Venous Thromboembolism (VTE) awareness roadshow campaign took place in partnership with Thrombosis Ireland, Healthy Ireland and Community Healthcare Organisation 9. VTE is reported to be the leading cause of hospital associated death and direct maternal death in developed countries.



The roadshow which made 25 stops across 11 hospitals and communities is the work of Prof Fionnuala Ni Ainle (chair of the Ireland East Hospital Group VTE Steering Group) and Dr Barry Kevane (Consultant Haematologist), both Mater consultants. The objective of the project was to teach participants about the dangers of VTE, help them spot the symptoms and get them to inform patients about the 90-day risk.

Design Week 2019

This year, 33 National College of Art and Design (NCAD) students undertook 10 design challenges proposed by Mater Hospital staff. 10 challenges were selected from a total of 34 submissions following an open call out to hospital staff.

This year's 10 design challenges were

- 1 **Sees the choice** enabling patients with language difficulty to choose their own hospital meals.
- 2 **Embrace the Risk** fostering open discussion about the relative risks of frail older people continuing their recovery at home versus in hospital.
- 3 **How's the Form?** accessing information on health and social care services for frail older people across North Dublin.
- 4 **Dirty Old Town** encouraging patients and visitors to practise better hand hygiene throughout the hospital.
- 5 **IN-FORM** A new wheelchair seating guideline.
- 6 **Knowledge and Power** empowering healthcare professionals to save lives through quick access to information.
- 7 **Who am I?** reducing patient registration ID changes.
- 8 **Small Changes. Big Impact** an information pack to improve post-operative lifestyle of skin cancer patients.
- 9 **Excuse me, where's reception?** tackling the issue of patients and visitors getting lost on arrival to the hospital.



- 10 **EduCards** enabling lung transplant patients to start well and continue well post-surgery



On Friday, 8th November, following four days of intensive research, ideation and prototyping and testing, NCAD students presented their final solutions to a captive audience at the Design Showcase. Following the design showcase, the Transformation Office and NCAD facilitated a workshop to help the Mater Team leads generate a practical plan to make it happen and the team leads went on to bravely pitch their plan to a judging panel.

The winning design was proposed by Maria Love, Medical Social Worker and was awarded a €3,000 seed fund kindly sponsored by Spark Innovation. The design named Educards is an innovative solution for enabling patients to better understand and manage medication pre and post lung transplantation.

A second project looking at wayfinding solutions at hospital entry points received special commendation and a 2nd seed fund of €1,500 from the CEO, Alan Sharp.

Dublin Culture Night

For the third year running the hospital participated in Dublin Culture Night on the 20th September. This year saw a record number of attendees. Staff, family and friends, members of the public, young and old were welcomed into the hospital to enjoy the interactive exhibits. There were many fascinating historical and educational exhibits and interactive displays and a total of 16 departments participated.



For the first time this year a 40-minute walking tour was also included and the relocation of the event to the Pillar Centre greatly improved the experience for all.

Hospital Professional Awards 2019

Ten Mater Hospital nominations were selected as finalists in this year's Hospital Professional Awards. The Hospital Professional Awards recognise the achievements of individuals and teams working in the secondary care sector; their dedication and innovation which positions hospitals at the forefront of healthcare, improving the lives of people across the country.

- 1 Innovation in Aseptic Compounding: ACU Team
- 2 Hospital Pharmacy Technician: Louise Enright
- 3 Oncology Excellence: Brid Ryan
- 4 Excellence in Patient Safety: Claire Shine and Mariosa Kieran (Med Rec)
- 5 Infectious Diseases: Ciara Levey
- 6 Hospital Pharmacy team: PAMO Directorate
- 7 Excellence in Psychiatry: Marie O'Halloran
- 8 Multidisciplinary Team: DEMRC
- 9 Haematology Project of the Year: Aisling Beakey and Prof. Ni Ainle VTE Thromboprophylaxis
- 10 Excellence in Respiratory Initiative: Patricia Ging, Sara Winward and the Transplant Team

The 7th annual Irish Pharmacy Awards took place on Saturday, June 22nd 2019. Hosted by Colm O'Regan, the awards ceremony was held in Carton House Hotel and Spa in Kildare, with the Mater winning two awards.



John Barbour (GSK) and Sara Winward

Sara Winward, Advanced Nurse Practitioner at Mater Misericordiae University Hospital, picked up the GSK Excellence in Respiratory Initiative Award at the 2019 Hospital Professional Awards.



Claire Shine and Mariosa Kieran

The Medicines Reconciliation Service with Claire Shine and Mariosa Kieran picked up the award for Excellence in Patient Safety Award at the 2019 Hospital Professional Awards ceremony.

Sr Margherita Rock Scholarship Programme

July 2019 marked the very sad passing of Sr Margherita Rock. Her life was dedicated to the Mercy community, and to the patients and staff of the Mater Misericordiae University Hospital for well over fifty years. As a mark of the esteem she was held, the Mater has developed a new education scholarship in her name.



Sr Margherita Rock

The scholarship is for students from designated secondary schools to one year FETAC level 5 in Whitehall College over the next five years (2020 to 2025).

This scholarship will be offered to two students annually from four selected local schools (O'Connell's Secondary School, North Richmond Street, Larkin Community College, Champions Avenue, Cathal Brugha Street, St. Joseph's C.B.S. Fairview and Mount Carmel Secondary School, Kings Inn Street).

The scholarship programme was launched in September 2019 and includes

- ▶ College Course Fee
- ▶ Two weeks unpaid work experience placement in the Mater during the Academic Year
- ▶ A one year offer of employment at entry level or equivalent on successful completion of 8 modules with distinctions in a minimum of 6 modules and 2 merits
- ▶ Mentorship programme provided by the NEIC (North East Inner City Programme) for each student during their one year employment phase

Mission Effectiveness Conference 2019

The annual mission conference was held on the 21st May entitled “Staff Wellbeing and Resilience - How can we create an environment that cares for the carers?” This conference explored the challenges of working in the pressurised environment of healthcare delivery and discussed how healthcare organisations address burnout and improve wellbeing of their staff in order to enhance best practice in patient quality and safety.

The Conference was attended by over 140 delegates, with Keynote Speaker Dr Paddy Barrett, Consultant Cardiologist, Blackrock Clinic, Dublin, who spoke about Physician Burnout. Dr Barrett hosts the internationally acclaimed podcast series The Doctor Paradox, and has featured in Time Health, The New York Academy of Sciences, The New England Journal of Medicine and The Lancet.



Energy Performance Contract (Reducing our Carbon Footprint)

Works on the Mater Hospital Energy Infrastructure Contract, which was awarded to Veolia commenced in late 2018.

The project will

- ▶ Reduce the hospital’s carbon footprint by 81,000 tonnes
- ▶ Cut the hospital’s imported electricity by 77%
- ▶ Deliver €26 million in guaranteed energy and operational savings

The Mater Hospital is the first hospital in Ireland to undergo such extensive modernisation, under the Carbon Energy Fund (CEFI), with a capital investment of €11.3m. This project covers a wide range of energy upgrades,

Service Achievements Awards

Service Achievement Awards

The Hospital’s second Service Achievement Award Ceremony was held on Friday 18th October 2019 acknowledging over 100 staff who have given 23 years or more dedicated service to the hospital.

The long serving staff attended a ceremony in the Pillar Room where the Chief Executive Officer Alan Sharp acknowledged their many years of commitment and dedication to delivering high quality care and compassion every day to our patients and their families. Members of the Sisters of Mercy Sr Aidan, Sr Attracta, Sr Mary and Sr Nora, joined us for this memorable occasion.

Our deceased colleagues Sr Margherita and Sr Eugene were remembered together with colleagues who have passed away but are still very much in our Mater memories.

Christmas Tree Illumination

Christmas Tree Illumination – 4th December 2019
The Hospital held its annual Christmas Tree Illumination event on Wednesday 4th December 2019 at 4.30pm. This year we welcomed our Special Guest, Baz Ashmawy to light the Mater Christmas Tree. The Irish Prison Service Pipe Band and the Mater Choir provided entertainment on the evening and made this annual event so special.

Santa (Tom, a Mater Volunteer) welcomed the children and listened intently to their requests for this year.

Patient Centred Care

Major Trauma Centre

A Trauma System for Ireland¹ was published by the Department of Health in February 2018. It addressed the entire care pathway from prevention through to rehabilitation and recommended the establishment of an inclusive trauma system with two hub-and-spoke Trauma Networks and up to 13 trauma receiving hospitals. Following on from the report a trauma bid was launched by the government in 2019.

Evidence from the UK has shown that the implementation of a Hub and Spoke mode, with a central Major Trauma Centre (to look after the most seriously injured patients) combined with Trauma Units, has led to a 30% reduction in preventable mortality.

At the heart of each Trauma Network will be a single Major Trauma Centre, one hospital which will deal with all major trauma cases across the Network it serves. There will be one hospital in Dublin selected as the Major Trauma Centre and

the HSE Trauma Report Implementation Group is completing a selection process across the Dublin Hospital Groups to designate a single Major Trauma Centre, as well as a reduced number of Trauma Units.



A Geospatial Analysis of Adult Major Trauma Transit Time in Dublin, published in September's issue of the Irish Medical Journal demonstrated that all patients could get to any Dublin ED with a median time of 18 minutes and within the internationally recommended transfer time of 45 minutes to a Major Trauma Centre.

The Mater Hospital is a candidate for selection as the Major Trauma Centre, with St Vincent's

¹ A Trauma System for Ireland. Report of the Trauma Steering Group, February 2018

University Hospital as a Trauma Unit for the east of Ireland. While no one hospital in Dublin has every specialist service component required for immediate designation as a Major Trauma Centre, the Mater has more of the required specialties than any other candidate site.

An independent assessment panel has completed a series of site visits to the six hospitals identified as options for the country's central major trauma centre and Dublin's major trauma units, as part of the assessment process. The panel has been reviewing proposals from the hospitals in line with the service specifications and assessment criteria.

Trauma Care Conference: Developing an integrated trauma solution for Ireland

The 4th Annual Trauma Conference was held on the 7th June 2019 at the Mater Hospital. The purpose of the conference was to exchange ideas, experiences and lessons learned about the role of internationally accepted systems and protocols in the field of trauma care.

Dr Fran O'Keeffe, the Mater Trauma Clinical Lead and Consultant in Emergency Medicine, highlighted the crucial importance of developing a Major Trauma System in Ireland. He shared his background in working in The Alfred Major Trauma Centre in Melbourne, Australia and how similar systems established in Australia and most recently the UK have led to a 50% reduction in mortality among Major Trauma patients.



Prof Brendan Kinsley, Clinical Director, Dr Fran O'Keeffe Consultant in Emergency Medicine, Dr Ger O'Connor Consultant in Emergency Medicine, Una Cunningham, Clinical Directorate Lead, Health & Social Care Professions Directorate (HSCP) Head of Transformation, Marion Lynders, TARN Co-Ordinator

Air Emergency Transfer: First Simulation at the Mater

On Thursday 3rd October, the Emergency Aeromedical Service landed a helicopter on the helipad of the Mater Hospital, in the first ever Aeromedical simulation at the hospital. A trauma *patient* was on board the helicopter and was transferred to the Mater hospital for emergency care during this demonstration.



The Mater Trauma Team of doctors and nurses supported by the HSE's National Ambulance Service and Dublin Fire Brigade were on-site to meet the *patient* and Emergency Aeromedical Service upon arrival at the Mater. The team took part in a simulation of life-saving treatment which started in the prehospital arena and continued in the Emergency Department.

“ It is really important that critically ill and injured patients get the best treatment in the best place for that condition, in the correct time frame. We are putting in place the building blocks and processes so that those who are critically ill or injured - be that as a result of major trauma, transplant or other critical illness - can in the future be taken to the Mater Hospital by air to receive the highest quality care. We are working closely with our colleagues in the Emergency Aeromedical Service to improve patient outcomes and ultimately save lives.”

*Dr Ger O'Connor, Consultant in
Emergency Medicine*

According to the National Office for Clinical Audit's Major Trauma Report 2017, only 1% of major trauma patients are transferred to hospital by air, with a further 1% making the critical journey by a combination of air and ambulance.

“ We are delighted to be able to work with National Ambulance Service, Dublin Fire Brigade and the Mater Hospital Trauma Team to deliver high-level multidisciplinary complex care. This test landing today is a fantastic example of inter-agency cooperation in order to serve trauma, transplant and stroke patients from across the country.”

*Lieutenant Colonel Philip Bonner of the
Emergency Aeromedical Service*

Personalised Medicine

Medical genetics and genomics is a medical subspecialty which provides a clinical genetics/genomics service, incorporating diagnosis and counselling for patients affected by or at risk of a genetic condition.

There are in excess of 7,000 of these conditions. The service sees and manages families with genetic conditions, rather than individual patients.

The most common referrals to the service include

- ▶ Patients/families affected by or at risk of hereditary cancer
- ▶ Patients/families affected by or at risk of hereditary heart disease
- ▶ Patients/families affected by or at risk of inherited neurological disorders
- ▶ Children/adults with congenital anomalies
- ▶ Children/adults with intellectual disability
- ▶ Families affected by or at risk of chromosome disorders
- ▶ Families affected by inherited disorders such as cystic fibrosis
- ▶ Healthy family members seeking predictive genetic tests for the genetic disorder identified in their family

Overall, the population of adults diagnosed with genetic conditions is growing exponentially and will likely continue to grow for the foreseeable future. This is primarily due to

▶ Increased recognition and diagnosis rate.

▶ Medical advances in treatments which has resulted in increased survival of children with genetic conditions previously considered fatal.

Many people now survive into adulthood with genetic conditions such as severe osteogenesis imperfecta and inherited metabolic diseases such as Lysosomal Storage Disorders and Mitochondrial Disorders.

Centralised Care

The centralisation of clinical care for adult patients with genetic conditions and their families in a centre with a broad spectrum of specialties equipped to deal with the required care of these disorders and their concomitant chronic medical conditions is the model used in other developed countries.

The Mater has a number of those specialities that could act as a hub for the adult genetic services including

▶ Consultant clinical/biochemical geneticists

▶ Genetic counsellors

▶ Next Generation Sequencing Laboratory which includes a number of clinical scientists and bioinformaticians on staff

▶ National Rare Disease Office (80% of rare disease has a genetic basis)

▶ A broad range of clinical specialties on the Mater site already incorporate inherited conditions into their work including retinal disease, cardiac, liver and neurogenetics disorders, familial gastrointestinal and breast cancer.

▶ A developed Adult Congenital Heart Disease Service. Congenital heart disease, usually has a genetic basis, now represents the largest number of birth defects in Ireland, accounting for 1% of all live births per year. This national service provides specialist support to patients with complex congenital heart defects requiring lifelong care, with approximately 250 new patients each year.

Inherited Retinal Degeneration: Target 5000 Project

The Mater Hospital along with the Royal Victoria Eye and Ear Hospital and the Royal Victoria Hospital Belfast are the primary sites for the Target 5,000 project. Target 5000 provides a genetic and clinical diagnosis for people with Inherited Retinal Degeneration (IRD) and is supported by Fighting Blindness. The project is developing a national registry for IRD and enables access to clinical trials and approved therapies for Irish patients.

Inherited retinal degenerations, also called inherited retinopathies, refer to a group of often rare conditions in which defects in genes lead to photoreceptor cell death and associated vision loss. These conditions include

▶ Bardet-Biedel Syndrome

▶ Best Disease

▶ Blue Cone Monochromacy

- ▶ Choroideremia
- ▶ Leber Hereditary Optic Neuropathy (LHON)
- ▶ Leber Congenital Amaurosis (LCA)
- ▶ Retinitis Pigmentosa (RP)
- ▶ Retinopschisis
- ▶ Rod-Cone Dystrophy
- ▶ Stargardt Disease
- ▶ Usher Syndrome

The goals of the Target 5000 programme are

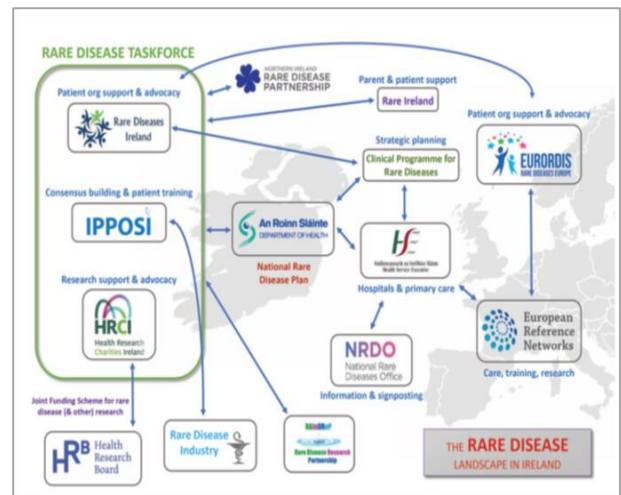
- ▶ To provide a genetic and clinical diagnosis to people living in Ireland with an inherited retinopathy
- ▶ To develop a national registry of inherited retinopathies and enable access to clinical trials and approved therapies in Ireland and abroad
- ▶ To embed an excellent clinical management infrastructure
- ▶ To discover new genes responsible for inherited retinal degenerations

National Centre for Rare Diseases

Rare diseases are characterised by their relatively low prevalence (less than 1 in 2,000 people in the EU). To have a rare disease is to have a condition that often goes undiagnosed for years. Although individual rare diseases affect relatively small

numbers of people, it is estimated that 350 million people globally have a rare disease, more than double the number of patients affected by AIDS and cancer combined².

There are currently up to 8,000 described rare diseases. Collectively, these diseases affect around 6% of the population (accounting for at least 300,000 individuals in Ireland). Because of inadequate coding systems for rare diseases, not only nationally but also internationally, the total dimension and extent of the disease burden for these conditions is not currently quantified. It is estimated that approximately 70-80% of rare diseases have a genetically identified origin (Orphanet 2019).



Visual Overview of the Rare Diseases Policy Landscape³

The National Rare Disease Plan (NRDP)⁴ was published in 2014 and the National Rare Disease Office (NRDO) established in the Mater Hospital in 2015. In 2019 the National Clinical Programme for Rare Diseases', Model of Care was published. The National Rare Diseases Office is the co-ordination hub for clinical rare diseases expertise in Ireland. The office is staffed by healthcare professionals who have significant experience working with people affected by rare diseases. It provides current, reliable information about genetic and rare diseases to patients, families and health and

² Tambuyzer, E et al in 'Nature Review'. 13 December 2019. Therapies for Rare Diseases: Therapeutic Modalities, Progress and Challenges Ahead

³ Rare Disease in Ireland and a Consensus for Action.

⁴ National Rare Disease Plan for Ireland 2014-18

research professionals. The office also manages the Irish section of Orphanet, the European portal on rare diseases information and orphan drugs.

The Office is responsible for mapping the location and availability of clinical expertise and centres of expertise in Ireland. Over 75 Irish centres have been mapped and listed on Orphanet. The Office provides information about virtual cross-border consultations and centres of expertise in neighbouring EU Member States.

National Centre for Inherited Metabolic Disorders

The National Centre for Inherited Metabolic Disease (NCIMD) is a referral centre for people who are diagnosed with or suspected of having a metabolic genetic disorder. The paediatric service is based in the Children's University Hospital, Temple Street with the adult service based at the Mater Misericordiae University Hospital. The Adult Unit in the Mater provides multidisciplinary care for patients with known or suspected metabolic disorders. The team at the hospital help patients to manage their conditions with optimal diets that match their metabolic needs.

The management of metabolic disorders is complex and demands dedicated input from the multi-disciplinary team led by a Metabolic Consultant. A holistic and family centred approach is used, with input from medical, nursing, dietetic, psychology, administration, social work, physiotherapy, laboratory staff and play specialist. Suspected cases of metabolic disorder are referred from hospitals across the country.

Colorectal Cancer Family Screening Clinic

Colorectal cancer can run in families, and about 5-10 % of colorectal cancer is thought to be hereditary. The team at the Mater offer family

screening programmes for Hereditary Non-Polyposis Colorectal Cancer (Lynch Syndrome) and Familial Adenomatous Polyposis (FAP) to determine an individual's risk for colorectal cancer. The team follows patients who have an increased risk for polyps, colorectal cancers, gastrointestinal cancers, pancreatic cancer and related cancers. In excess of 90 families are referred annually to the screening service to evaluate cancer risk and implement a screening and cancer prevention strategy.

Hereditary Cardiac Syndromes

The Mater Hospital provides a national service for people with known or suspected inherited cardiovascular disease. The service diagnoses and manages the risk of inheritable cardiac risk and SADS (Sudden Arrhythmic Death Syndrome) in family run clinics. Clinical family screening can identify the cause of the SADS in approximately 25% of deaths, and genetic studies can help us identify the cause in another 15-20%.

The team delivers a comprehensive evaluation for patients to understand their diagnosis and the potential genetic findings associated with the condition and provides a comprehensive education and a treatment plan based on their clinical diagnosis and specific needs. Experts in multiple disciplines including electrophysiology, cardiomyopathy, congenital heart disease, medical imaging, psychiatry and genetic counselling are brought together to provide the full spectrum of evaluation, clinical and genetic diagnostics and treatment modalities for adults and children.

New Equipment for Cancer Research Next Generation Sequencing (NGS) Laboratory

In 2019 the Next Generation Sequencing (NGS) Laboratory in the Mater Hospital received new equipment for their bio blood bank. Purchased

with funds granted by the Mater Foundation, the Lab acquired a scanner, barcoded tubes and processing software. The Lab's aim is to build up an extensive bank of patient blood samples, vital for research into blood cancers.

Patients with haematological malignancies, for example Multiple Myeloma CLL or AML, will benefit from this, as the samples collected from patients will be used to test new treatment strategies and research into blood cancers. Haematological malignancies account for up to 11% of new cancer diagnoses in Ireland.

The Mater is part of a nationwide collective network of clinicians and scientists in Ireland, called the Blood Cancer Network Ireland (BCNI). The six participating hospitals include the National University of Ireland Galway, Trinity College Dublin/St James Hospital, University College Cork/Cork University Hospital, Beaumont Hospital and Mater Misericordiae University Hospital.

As blood cancers are relatively rare, the national effort to collect sufficient number of samples is significant. The blood bank will contribute heavily to determining the best-suited treatment for individual patients, providing the research community with high quality patient samples for translational and clinical blood cancer research. To date, the lack of high quality patient samples has been a major drawback for drug discovery studies.



Despina Bazou, Translational Research and Education Lead in Pathology, pictured with the new equipment in the Next Generation Sequencing Laboratory

Cancer Directorate

The Mater Misericordiae University Hospital is one of the eight nationally designated cancer centres, a designated centre for breast, lung, prostate and colorectal cancer as well as being a major cancer clinical trials centre.

The Cancer Directorate at the Mater Misericordiae University Hospital was formed in 2019 under the leadership of Prof Michaela Higgins.

The Cancer Directorate has an ambitious agenda to evolve into a world class cancer centre and has defined its key priorities over the next five years as

- ▶ Work towards Organisation of European Cancer Institutes (OECI) Accreditation as a Cancer Centre

- ▶ Develop an Adolescent and Young Adult Cancer Centre

- ▶ Collaborate with our community partners

- ▶ Develop an Early Phase Clinical Trials Unit

Highlights of 2019

- ▶ **Breast Cancer** 602 breast cancers diagnosed at the Breast Health Unit and BreastCheck services on the Mater Campus

- ▶ **Gynae-Oncology Service** Has become the largest centre in the country for gynaecological malignancy and now provides a fast-track multi-disciplinary and patient-centred clinic for newly diagnosed patients

- ▶ **Haematology Virtual Clinic** 2019 saw the introduction of a virtual clinic that removed 254 patients from the waiting list

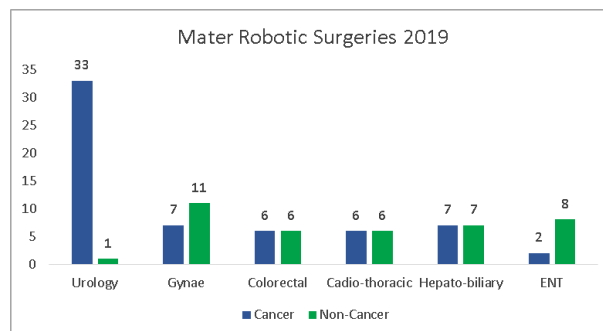
- ▶ **Irish Healthcare Award** The Clinical Nurse Specialists in the oncology and haematology team developed a multi-media educational programme for patients on immunotherapy treatments. The programme won an Irish Healthcare Award in November 2019

- ▶ **Clinical Trials** Over 100 cancer patients were enrolled in a clinical trial at the hospital in 2019

Robotic Surgery

Robotic surgery commenced in the Mater Hospital on the 16th April 2019 with the first robotic procedure being carried out using the DaVinci Robotic Surgery platform. To date six surgical specialities have used the robot which brings the following benefits

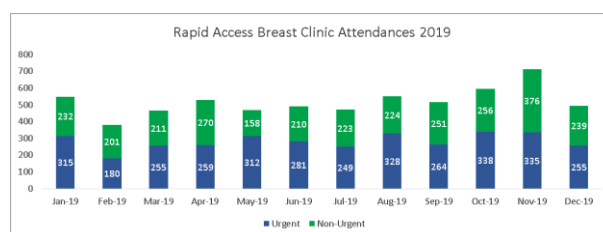
- ▶ **Urology** Significantly shortened recovery time for patients compared to both open and laproscopic prostatectomy techniques
- ▶ **Thoracic** Tumours previously only accessible by open chest approached can now be removed via a minimally invasive approach with reduced healing times
- ▶ **Head and Neck Surgery** Posterior tongue tumours can be removed via the robotic approach as compared to the alternative of a very debilitating destructive open surgery with a hospital stay of 2-3 months
- ▶ **Gynaecology** Cancer of the endometrium in women with extremes of body mass index are ideally performed via the robot as the open/laparoscopic technique is more difficult and brings a greater morbidity
- ▶ **Colo-rectal Surgery** Very low rectal tumours usually down staged with chemoradiation have previously been extremely difficult to remove especially in the narrow male pelvis. The advanced robotic approach is ideal here
- ▶ **Hepatobiliary Surgery** The robotic approach is ideal for the excision of metastatic lesions in various lobes of the liver. The shortened recovery time enables patients to resume systemic chemotherapy without delay



Robotic Procedures at the Mater 2019

Breast Cancer

Rapid Access Clinic



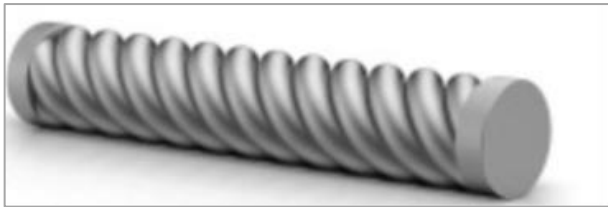
Rapid Access Breast Clinic Attendances 2019

The Mater Hospital is one of the eight nationally designated cancer centres and provides rapid access cancer services for patients with suspected breast, lung and prostate cancer. In 2019 over 6,000 patients attended these services with the Rapid Access Breast Clinic being the largest in the state with the highest number of urgent referrals.

Innovation in Breast Cancer

A new technique was introduced in 2019 for the excision of non-palpable breast lesions. The Mag seed marker is a small radiation-free magnetic seed that is easily placed by the radiologist into soft tissue. The seed is approx. 5mm long, smaller than a grain of rice. The mag seed can be placed in the breast up to 30 days in advance, reducing the patient's time in hospital and has largely replaced wire based breast procedures. Like the wire, the mag seed is placed with the help of either ultrasound or a mammogram. It is simpler than having a biopsy. At the time of surgery a magnetic probe is used to locate the marker. The

sentimag sensing machine makes sounds of different pitches and gives a reading to indicate how close the probe is to the seed. The seed is then removed with the tumour.

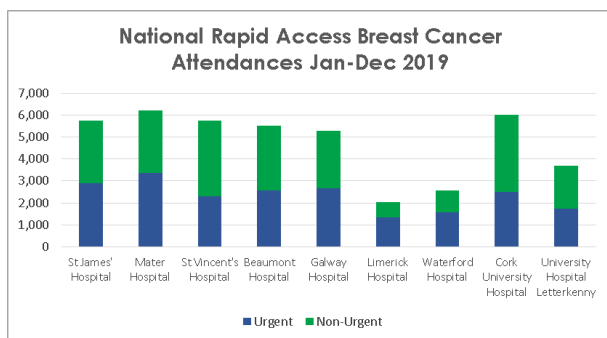


Enlarged Image of Mag Seeds

The aim of the procedure is to improve the patients experience as they can have the seeds inserted in advance and it reduces their time in hospital and the number of procedures required on the day of surgery. The seeds are also easier to place and less uncomfortable for patients. 56 patients had mag seeds inserted over the course of 2019.

Service Improvement • Breast Cancer Service

Over 6,000 referrals are received in the symptomatic breast service (Breast Health) annually, 55% of which are triaged as urgent and 45% as non-urgent.

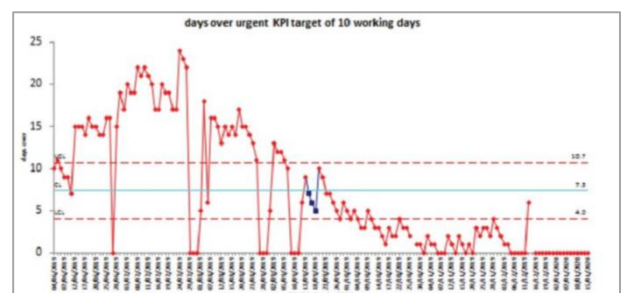


National Rapid Access Breast Cancer Attendance 2019 by urgent/non-urgent classification

The Mater Symptomatic Breast Service is the largest Rapid Access Clinic service in the country. However, due to high volumes, high numbers of urgent referrals and the complexity of those

referrals, the service had been performing below both the National Cancer Control Programme's Key Performance Indicators in both urgent and non-urgent referrals.

The team undertook a Lean Methodology review of the service (Value Stream Analysis followed by a number of Rapid Improvement Events) to address the issues in the service and reduce the waiting times for patients and their families. Since September 2019 improvement has been demonstrated monthly, with only 4 dates exceeding KPI targets in December.

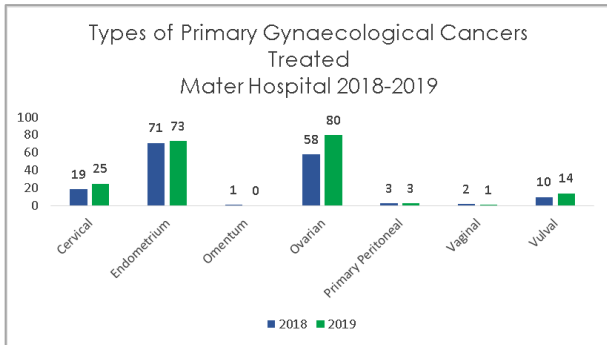


Rapid Access Breast Cancer Clinic versus NCC KPI target

Gynaecological Oncology

The Gynaecology-Oncology service is a specialised sub-specialty of gynaecology and accepts tertiary and GP referrals for confirmed gynaecological cancers. The Gynaecology-Oncology team consists of specialist gynae-oncologists, specialist nurses including a Clinical Nurse Consultant and team of allied health specialists including physiotherapy, psychologists, social work and nutrition and dietetics.

The Gynaecology-Oncology team integrates with other departments including Medical and Radiation Oncology, Radiology and Pathology to establish individualised plans of the most appropriate treatment option through weekly tumour board meetings and radiology meetings. Gynaecology-Oncology also participates actively in trials and research with dedicated staff attending clinics and the weekly tumour board meeting.



Primary Gynaecological Cancers Treated at the Mater Hospital 2018-2019

Gynaecological Oncology Service Integration and Improvement

The Gynaecological Oncology team agreed that a unified service should be established between the Mater and St Vincent's University Hospitals to improve the patient journey and quality of care for women with a gynaecological malignancy.

A value stream analysis (VSA) was completed with the objective of identifying opportunities to streamline, standardize and optimize the patient pathway for Gynae-Oncology patients improving the patient journey and quality of care.

A series of Rapid Improvement Events (RIEs) were undertaken, after the VSA, with targeted areas of improvement including triage, multi-disciplinary teams (MDT) meeting, outpatient clinics, survivorship and data availability. Some of the key outcomes of the work were

- ▶ A system of increasingly accurate data collection
- ▶ The design and set up of a priority clinic to include medical and radiation oncology
- ▶ The implementation of a virtual clinic to reduce hospital visits and improve patient experience
- ▶ The creation of an MDT coordinator post
- ▶ A standardized referral form

Key Improvements (pre vs post improvement work)	Initial State	Current State
Time from referral to initial assessment reduced	57% < 14 days	100% < 14 days
Number of patients re-discussed at MDT reduced	10%	2%
Priority Clinic: Clinician-Patient contact time improved	20 minutes	45 minutes
Review Clinic: Clinician-Patient contact time improved	10 minutes	30 minutes
Time from referral to agreement of treatment plan for patients improved	72% < 28 days	100% < 28 days
Time from referral to commenced treatment improved.	66% < 62 days	100% < 62 days

“The improvements that we have made mean that we are now offering women the same standardised efficient service week in week out. We have changed the way we have run our clinics to include increased consultant face time and to reduce unnecessary visits. There is now a one stop shop clinic for new patients to see the surgeon and radiation/oncology service at the same time. The changes implemented have markedly cut down the wait time from referral letter to first treatment and have reduced the wait time for results.”

Mr Bill Boyd, Consultant Gynaecologist

European Society of Gynaecological Oncology (ESGO) Accreditation



ESGO is the leading European organisation involved in the treatment, care and research of

gynaecological cancer. Based on European standards of training and care they have developed, ESGO provides supervision of accredited training and has been running hospital recognition for excellence in training and care while accrediting centres across Europe.

The ESGO certification for advanced ovarian cancer surgery is an award attributed to institutions which can offer patients the specific skills, experience, organisation and dedication that are required to achieve optimal levels of surgical care.

The ESGO certification is based on the completion of 10 quality indicators and a scoring system that has been designed and internally validated with the International Expert Panel. Centres interested in getting certified must

- ▶ Complete and meet the ESGO quality indicators
- ▶ Perform a minimum of ≥ 24 cytoreductive surgeries for advanced epithelial ovarian cancer per year and a minimum 12 primary debulking surgeries yearly (secondary and tertiary surgeries for recurrences are not included)

Only centres that meet the above requirements can start the application process for ESGO certification. The Gynae Oncology team at the Mater and St Vincent's Hospitals have started this accreditation journey.

National Centre for Peritoneal Malignancy

The Mater Misericordiae University Hospital is the National Cancer Control Programme's (NCCP) single National Centre for Peritoneal Malignancy,

with 270 patients having undergone surgery at the hospital. Prior to the services repatriation to Ireland from Basingstoke, UK in 2013, patients diagnosed with these forms of cancer had the very poor prognosis with a 6-month life expectancy. Patients can now benefit with improved survival, and importantly, improved quality of life, from this aggressive surgical approach.

In January 2019 the hospital hosted an event to mark the 200th case of cytoreductive surgery with HIPEC (Hyperthermic Intraperitoneal Chemotherapy) for peritoneal malignancy. The vast majority of patients underwent surgery for pseudomyxoma peritonei, metastatic appendix adenocarcinoma or colorectal cancer peritoneal metastases. The programme has also expanded to treat patients with advanced ovarian cancer and to selected patients with gastric cancer peritoneal metastases.

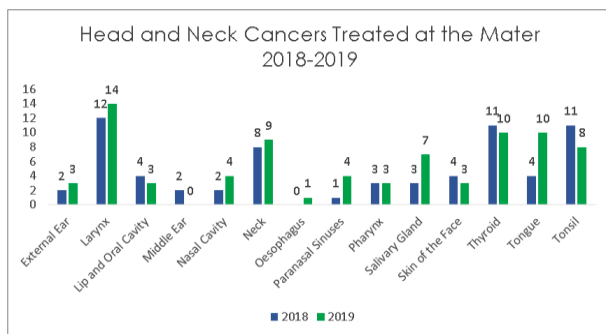
HIPEC for Ovarian Cancer

The Gynaecological Cancer service is one service operating across three sites (Mater Misericordiae University Hospital, National maternity Hospital, Holles Street and St Vincent's University Hospital). This single service integration aligns with the national strategy of centralising lower volume cancer services. Patients with a gynaecological cancer move between our sites to avail of capacity in our OPDs and theatres or gain access to specialised services in one of the group hospitals. This integration of service is exemplified by the provision of HIPEC for ovarian cancer. Hyperthermic intraperitoneal chemotherapy (HIPEC) is a highly concentrated, heated chemotherapy treatment that is delivered directly to the abdomen during surgery. The Mater Hospital is the only site in Ireland providing this service. Ovarian cancer patients attending the Gynaecological Oncology service, irrespective of which hospital they attend, can seamlessly avail of this treatment option if appropriate. The service is now the largest provider of gynaecological oncology care in the country and has developed a streamlined process to manage

the expected doubling of the requirement for HIPEC in ovarian cancer patients in the next 5 years.

Head and Neck Cancer

In 2018 the Head and Neck services from the Mater and St Vincent's Hospitals formed an integrated unified service. The integration of the services allows the pooling of our resources and takes advantage of the breadth of expertise in both units. Not only does this allow more efficient and flexible use of theatre time, ICU / HDU availability, it affords access to a broader range of specialties on-site for more complex cases. The direct benefit for patients has been the reduced waiting times for outpatient appointments and theatre access despite the high volume of Head and Neck cases passing through the new integrated service.



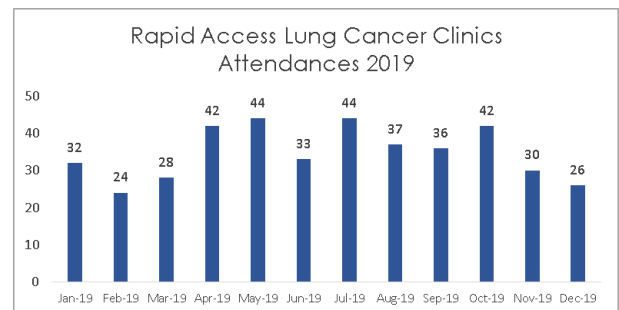
Head and Neck Cancers Treated at the Mater Hospital 2018-19

A bi-weekly Head and Neck Multidisciplinary Team Meeting (MDT) is run in both hospitals with more complex cases discussed at the multi-site teleconferenced MDT across both hospitals. For more complex surgical cases the service takes advantage of the broad mix of specialties and expertise with cases that require free flap reconstruction by our plastic surgery colleagues brought to the Mater Hospital for their surgery. While patients who require transoral robotic surgery (TORS) can have their surgery in either in Mater or St Vincent's. Once functioning across both sites the Head and Neck service will become a European centre for training and education in this field.

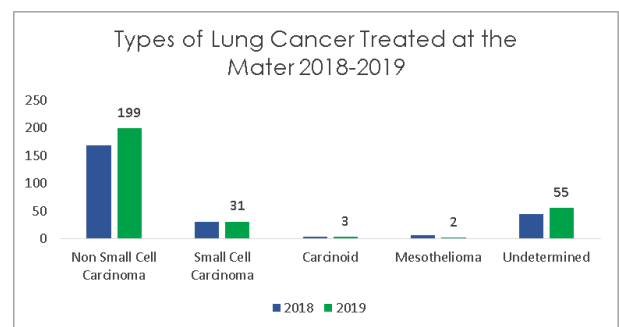
Lung Cancer

Rapid Access Lung Clinics

The Mater Hospital's Rapid Access Lung Cancer Clinic is one of the busiest services in the country. The National Cancer Control Programme designated KPI for Rapid Access Lung Cancer Clinics is % of patients attending lung rapid access clinics who attended or were offered an appointment within 10 working days of receipt of referral in designated cancer centres. The KPI is 95% which was exceeded by the rapid access team on every month in 2019.



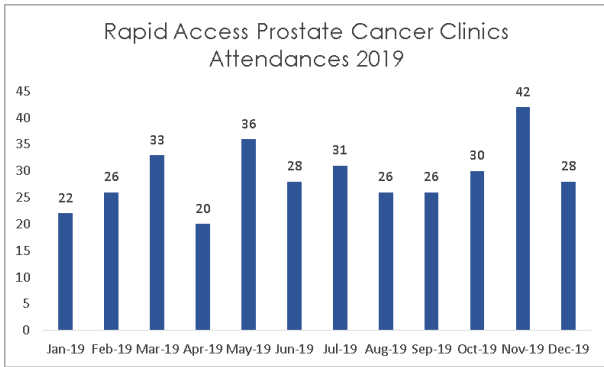
Rapid Access Lung Cancer Clinic Attendances 2019



Lung Cancers Treated at the Mater Hospital 2018-19

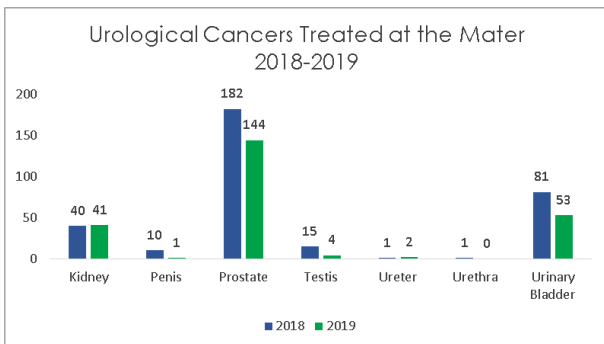
Urological Cancer

The Mater Hospital's Urology Department is the national centre for urethral surgery, a national centre for prostate cancer surgery, a national centre for kidney cancers involving the inferior vena cava (IVC), and is a tertiary referral centre for minimally invasive renal surgery and pelvic oncology.



Rapid Access Prostate Cancer Clinic Attendances 2019

The Mater Hospital is one of the eight National Rapid Access Clinics for patients with suspected prostate cancer. Rapid Access Prostate Clinics were established by the National Cancer Control Programme (NCCP) in 2012. Their aim is to provide faster access to diagnosis and treatment for patients with suspected prostate cancer. The Key Performance Indicator set by the NCCP is that *Men with suspected prostate cancer referred to a Rapid Access Clinic shall be offered an appointment to attend within 20 working days of receipt of referral. (Target 90%).*



Urological Cancers Treated at the Mater Hospital 2018-19

Colorectal Cancer

Colorectal Surgery

The Mater Hospital has five colorectal surgeons, with a special interest in colorectal cancer. The hospital is one of the national rectal cancer centres. Each year, over 250 colon cancers are diagnosed and treated at the Mater Hospital. The colorectal surgery department provides many innovative treatments to patients with cancer as

well as patients with various benign (non-cancerous) conditions including

► **Pseudomyxoma peritonei and HIPEC** The Mater Hospital is the only centre on the island of Ireland offering cytoreductive surgery and heated intraperitoneal chemotherapy (HIPEC) for certain cancers such as appendix tumours, advanced colorectal cancers, and other rare intra-abdominal cancers. HIPEC is a highly concentrated, heated chemotherapy treatment that is delivered directly to the abdomen during surgery.

► **TAMIS (Transanal minimally invasive surgery)** Transanal minimally invasive surgery (TAMIS or TaTME) provides a less invasive surgical option for patients with early stage cancer. Previously, surgery to remove these tumours required an abdominal incision. Now using innovative approaches, certain early stage cancers or rectal polyps may be removed without a surgical incision. Techniques such as this reduce pain and recovery time for patients.

Gastroenterology

The Mater Hospital is a tertiary referral centre and one of the National Leads in ERCP (Endoscopic Retrograde Cholangio-Pancreatography). In certain cases, patients require a more specialised endoscopic procedure with greater sensitivity and an ability to detect gastrointestinal abnormalities that a regular endoscopy may miss. ERCP is a diagnostic procedure used to examine the gallbladder, bile and pancreatic ducts. ERCP combines X-ray and endoscopy, allowing the consultant to obtain high-quality images of the anatomy.

ERCP is used when it is suspected that the person's bile or pancreatic ducts may be narrowed or blocked due to tumours gallstones that form in the gallbladder and become stuck in the ducts inflammation due to trauma or illness, such as pancreatitis infection valves in the ducts,

called sphincters, that won't open properly scarring of the ducts, called sclerosis pseudocysts—accumulations of fluid and tissue debris.

ERCP is a technically demanding procedure with the National Guidelines recommending between 200-300 procedures performed annually by each endoscopist to maintain the relevant competence level.

BowelScreen

In Ireland, bowel (colon, rectal or colorectal) cancer is the second most common newly diagnosed cancer among men and women with over 2,500 new cases reported annually. The number of new cases is expected to increase significantly over the next 10 years, due to the aging population. Colorectal cancer is currently the second most common cause of cancer death in Ireland.

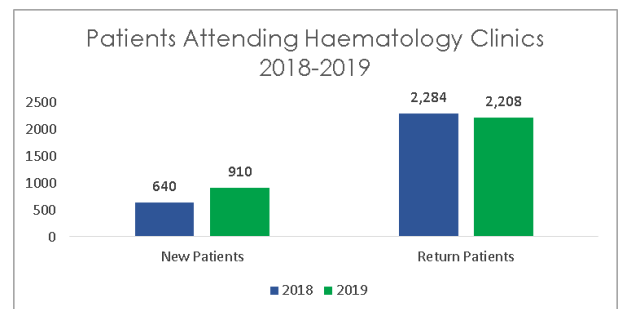
The national bowel cancer screening programme (BowelScreen) was set up as a national population screening programme for bowel cancer. It offers screening every 2 years to all men and women aged 60 to 69. Patients who have an abnormal screening test are offered a colonoscopy procedure. This investigational procedure is carried out in one of 14 designated hospitals around the country. The Mater is one of the 14 designated hospitals for BowelScreen and in addition it provides the full symptomatic service for patients that are diagnosed with cancer. The service at the Mater is accredited by the Joint Advisory Group on Gastrointestinal Endoscopy (JAG) whose purpose is to ensure that each endoscopy services have the skills, resources and motivation necessary to provide the highest quality, timely, patient-centred care.

Haematology

The haematology service in the Mater Hospital offers innovative treatment for a broad spectrum

of blood disorders, both non-cancerous and cancerous, including

- ▶ Anaemias
- ▶ Bleeding disorders
- ▶ Clotting disorders
- ▶ Anticoagulation problems
- ▶ Myeloproliferative disorders (essential thrombocythemia, myelofibrosis, chronic myeloid leukaemia)
- ▶ Plasma cell disorders
- ▶ Platelet disorders



Haematology Clinic Attendances 2018-2019 by patient type

Multidisciplinary working is integral to haematology and at the Mater this involves weekly multidisciplinary team meetings (MDT's) and work closely to utilise a variety of treatment strategies that will best meet the patient's individual needs, including

- ▶ Chemotherapies and combinations of existing treatments
- ▶ Anticoagulation problems
- ▶ Radiation therapies

▶ Novel targeted therapies, which block specific molecules involved in the growth and progression of cancer cells

▶ Immune therapies, such as vaccine and cellular therapy

▶ Bone marrow/stem cell transplantation, including traditional and reduced-intensity transplant, using related, unrelated or umbilical cord blood cells for transplant

In 2019 a total of 177 Apheresis procedures were carried out on 52 patients

Collective Leadership (Co-Lead) for Safety Cultures in the Cancer Directorate

Collective Leadership and Safety Cultures (Co-Lead) is a 5-year programme in UCD that is researching the impact of an emerging model of leadership (collective leadership) on team performance and healthcare safety. The programme designs and implements collective leadership interventions for different team types and tests the impact of those interventions on staff performance and patient safety.

The overall aim of the programme is to support quality and safety cultures through the development of a new model of leadership that is associated with effective team performance.

The teams involved in the Cancer Directorate are

▶ Gynaecology

▶ Breast Health Unit

▶ Clinical Trials and Research Unit

▶ Oncology / Haematology Day Unit

▶ Cancer Directorate Administration Team

Community Intervention Team

The hospital's Information Management Services Department together with the Community Intervention Team (CIT) Glasnevin, is providing specialised healthcare to Mater patients in the community.

Based on an agreement between the Mater and the community, patients can be referred to the Community Infusion Therapy clinic in Glasnevin and receive a selected range of oncology services in or near to their home. In collaboration with Dr Cathy Kelly, Consultant Medical Oncologist and Caroline Smyth, CNM2 in CIT Glasnevin, the hospital's IT team have facilitated electronic access to pertinent clinical data in a secure and timely manner.

This fast-tracked provision of services brings huge efficiencies to the management of patients in the community, providing a rapid and integrated response to those who require acute intervention outside the hospital. The service enhances the overall primary care system by readily providing to the Community Intervention Team up-to-date clinical information, the patient's history, appropriate test results and much more.

Cardiovascular, Respiratory, Renal, Diabetes and Endocrine Directorate

The Mater Misericordiae University Hospital is a major national and international cardiovascular centre, providing care to patients with the full spectrum of cardiac conditions.

The hospital is the National Referral Centre for Adult Congenital Heart Disease, Sudden Adult Death Syndrome, the National Pulmonary Hypertension Unit and is the National Transplant Centre for Heart and Lung.

In addition, the hospital is a tertiary referral centre for interventional cardiology, electrophysiology and heart failure.

National Audit of Hospital Mortality (NAHM)

The National Office of Clinical Audit (NOCA) was established in 2012 to create sustainable clinical audit programmes at a national level. One of the major audits that NOCA undertakes is the National Audit of Hospital Mortality (NAHM).

The National Audit of Hospital Mortality for 2018 was released in November 2019 and presents an analysis of hospital mortality across six key diagnoses

▶ Acute myocardial infarction (AMI)

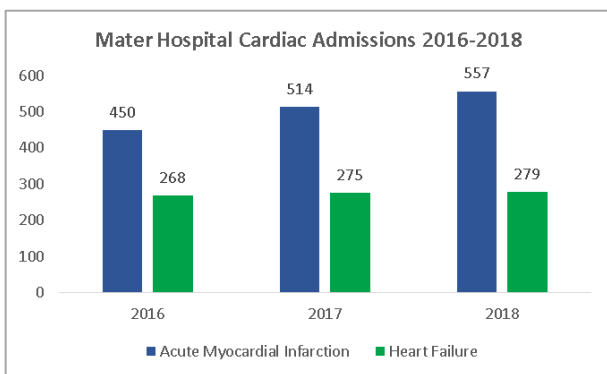
▶ Heart failure

▶ Ischaemic stroke

▶ Haemorrhagic stroke

▶ Chronic obstructive pulmonary disease (COPD)

▶ Pneumonia



National Audit of Hospital Mortality⁵ Admissions 2016-2018 for Acute Myocardial Infarction and Heart Failure

The audit uses a standardised mortality ratio (SMR) to calculate mortality trends. The SMR is a calculation of the number of patients that died within a hospital compared to the number that were expected to die when the SMR factors are taken into account. The SMR factors are

▶ Age

▶ Gender

▶ Co-morbidities (other existing conditions)

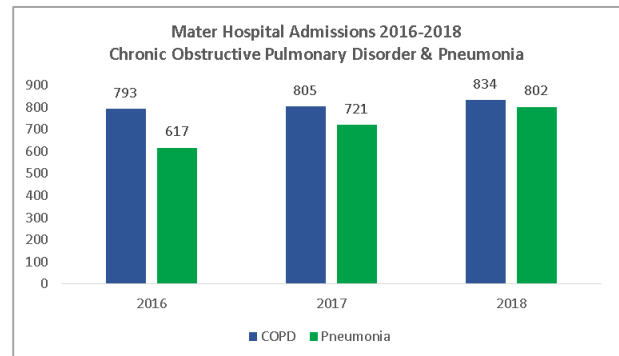
▶ Type of admission (emergency or elective)

▶ Source of admission (home, nursing home etc.)

▶ Number of emergency admission (last 12 months)

▶ Proxy level of deprivation (medical card)

▶ Palliative care



National Audit of Hospital Mortality Admissions 2016-2018 for COPD and Pneumonia

The National Audit found that the Mater Hospital was within the expected range for Standardised Mortality Ratio for all six diagnoses areas.

National Heart and Lung Transplantation Service

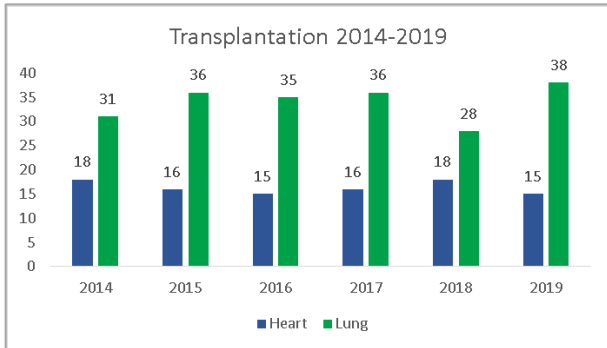
Heart and Lung Transplantation

The Mater Hospital is the National Centre for Heart and Lung Transplantation. 2019 saw the first successful combined lung/liver transplant, with less than 20 have been carried out worldwide. This was carried out jointly with colleagues in the National Liver Transplantation Service in St Vincent's University Hospital.

Overall, there were 53 transplantations carried out at the hospital over the course of the year, an increase of seven on the previous year, driven primarily by the increase in lung transplants. The

⁵ National Audit of Hospital Mortality 2018, National Office of Clinical Audit. Published December 2019

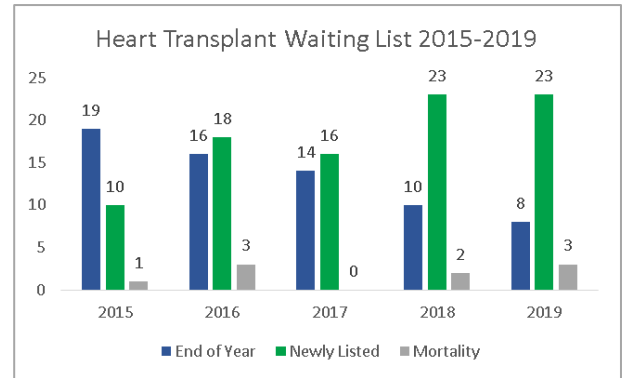
transplant activity once again showed the challenges of organ donation and matching recipients with surges of activity during the year, with relatively long periods of minimal activity.



Transplantations at the Mater Hospital 2014-2019

The programme is staffed by consultant surgeons with separate rotas for heart and lung transplantation. Most of the surgeons also cover one or more additional rotas (Thoracic, Cardiac or Congenital) within the Mater Misericordiae University Hospital or Children’s Health Ireland at Crumlin or St Vincent’s University Hospital.

The staffing of the transplant retrieval side of the service has been relatively static over the last few years. Recently there has been additional funding allocated to this service to allow for appointment of three further team members. There is general agreement that a thoracic organ retrieval team staffed by surgical retrieval specialist and theatre technicians / advanced nurse practitioners would support consistent retrieval of thoracic organs including expanding the use of marginal donors. Each retrieval team will likely consist of a retrieval specialist surgeon paired with a technical theatre assistant and / or with an advanced nurse practitioner. Once the retrieval team is expanded to its full numbers it should be possible to assist with retrieval of organs in Northern Ireland.



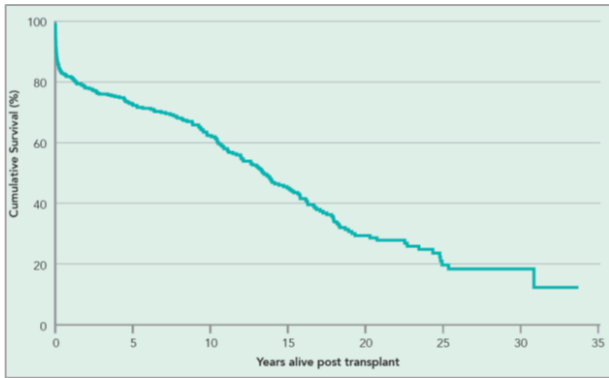
Heart Transplant Waiting List 2015-2019

Heart Transplantation

The left ventricular assist device programme has grown over the last few years with more patients on temporary and permanent ventricular assist devices. Left ventricular assist devices have reduced patients time spent in hospital awaiting transplant and has allowed for active rehabilitation before transplant.

The transplant team sees the potential for increased activity in the coming years, largely driven by the use of more marginal donors, the increased implementation of Ex Vivo Lung Perfusion (EVLP), the potential use of an organ care system for heart, as well as the appointment of new additional cardiothoracic transplantation surgeons to try to make the programme sustainable in terms of consultant.

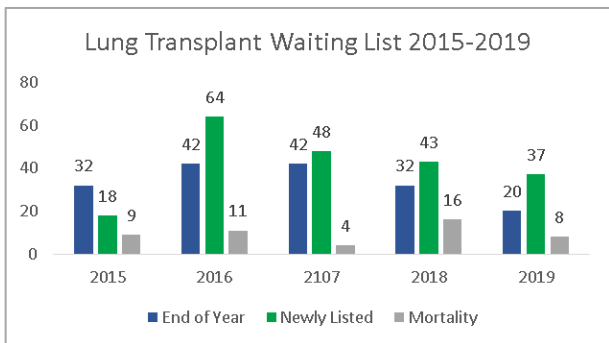
The multidisciplinary team includes transplantation surgeons, heart failure and transplantation cardiologist, respiratory and transplantation physicians, transplant coordinators, clinical nurse specialist, nursing, physiotherapist, psychologist, social workers and other medical personal depending on the patients underlying condition and associated conditions.



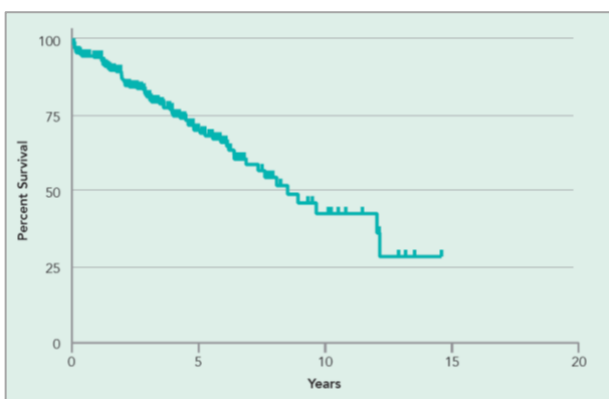
Survival Post Cardiac Transplant

Lung Transplantation

The team at the Mater works closely with the National Centre for Cystic Fibrosis in St Vincent’s University Hospital for Lung Transplantation. Ireland has the highest incidence of cystic fibrosis in the world and that cohort of patients are one of the main recipients of the lung transplantation service at the Mater.



Lung Transplant Waiting List 2015-2019



Survival Post Lung Transplant 2005-2019

Acute Myocardial Infarction

Interventional Cardiology at the Mater Misericordiae University Hospital offers cutting-edge diagnostic tests and nonsurgical interventional treatments for patients with coronary artery disease and congenital heart disease. The Mater Hospital is the designated primary PCI (percutaneous coronary intervention) centre for north Dublin and the North East of the country. All major myocardial infarctions (heart attacks) out of hours from this catchment area are treated in the Mater. In 2019 over **392** emergency cases were treated in the Mater’s cardiac catheterisation labs.

330 acute myocardial infarctions were treated in the Mater’s cardiac catheterisation labs in 2019.

Current guidelines for the treatment of ST-segment elevation myocardial infarction (STEMI) recommend a door-to-balloon time of 90 minutes or less for patients undergoing primary PCI. Door-to-balloon time has become a performance measure and is the focus of national and international quality improvement initiatives.

Heart Failure

The Heart Failure service at the Mater Hospital evaluates and manages a range of heart disease conditions that result in heart failure. Heart failure specialists use advanced therapies to treat patients with congestive heart failure and other conditions that might require a cardiac transplant.

Mater cardiologists are experts in diagnosing and treating heart failure, but also are well-versed in treating the following complex conditions

- ▶ Cardiac amyloidosis
- ▶ Cardiomyopathy
- ▶ Advanced congenital heart
- ▶ Cardiomegaly
- ▶ End-stage heart disease

The Mater Hospital runs a dedicated Heart Failure Clinic and Services for patients with heart failure. Heart failure services at the hospital covers the entire spectrum of care from medical management through device implantation and structural heart care to finally heart transplantation, if required. It is the provision of the complete range of services in one centre that make the Heart Failure services at the Mater unique.

Ventricular Device Programme

Ventricular Assist Devices (VAD) are mechanical pumps that takes over the function of one or both ventricles of the heart. It is a temporary device designed to help the heart pump enough blood to the body. To accomplish support, blood flows from the heart to the VAD (pump), and then back to the body. The patient may have a left ventricular assist device (LVAD), right ventricular assist device (RVAD) or biventricular assist device (BiVAD).

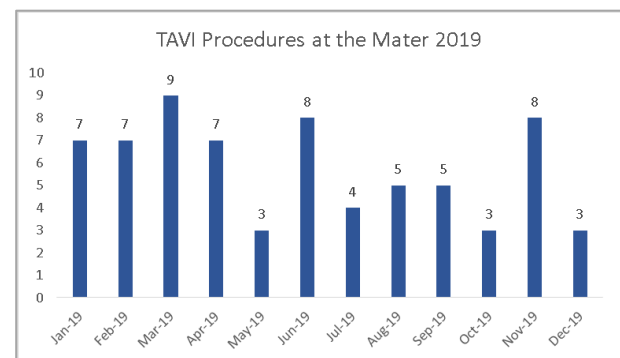
The devices are used as

- ▶ As a *bridge* to heart transplant surgery, increasing a patient’s survival time until a heart transplant can be carried out
- ▶ In a small number of instances, the VAD may be inserted as destination therapy or the only available treatment for the patient

The ventricular assist devices have reduced patients time spent in hospital awaiting transplant and has allowed for active rehabilitation before transplant.

TAVI Programme

The TAVI (Transcatheter aortic valve implantation) programme has, over the last few years in Ireland, been performed instead of Surgical Aortic Valve Replacement (SAVR) in patients at high risk of surgical complications. The main advantages of the technique is that the heart doesn't need to be stopped, so a heart-lung (bypass) machine doesn't need to be used, and it avoids making a large cut (incision) in the patients chest.



Transcatheter Aortic Valve Implantation at the Mater 2019

A review published by the Health Information and Quality Authority (HIQA)⁶ also assessed the costs of TAVI and SAVR in patients at low and intermediate risk of surgical complications and based on their assessment, HIQA advises that the

⁶ Health Technology Assessment of transcatheter aortic valve implantation (TAVI) in patients with severe symptomatic aortic

stenosis at low and intermediate risk of surgical complications, HIQA, November 2019

HSE should consider extending the TAVI care pathway to patients at low and intermediate risk of surgical complications.

National Pulmonary Hypertension Unit

Current international guidelines recommend that the management of pulmonary hypertension (PH) should take place in designated specialist centres where expert care can be provided at the correct stage of the disease process. There are seven specialist centres in Great Britain, one in Scotland and one in the Republic of Ireland, all of which are designated to treat pulmonary hypertension.

These form the association of pulmonary hypertension centres of Great Britain and Ireland. The National Pulmonary Hypertension Unit, a specialised centre for pulmonary hypertension, was established at the Mater Hospital in 2003. The Pulmonary Hypertension (PH) unit is the national referral and treatment centre for those diagnosed with PH in Ireland. The unit provides weekly specialty consultant led clinics and PH nurse specialist clinics and operates a hub and spoke model with Cork, Galway and Limerick to coordinate patient services and improve access to therapy.

The Pulmonary Hypertension programme at the Mater Hospital participates in numerous International Multi-Centre clinical trials for the treatment of PH thus providing treatment opportunities for patients to avail of innovative investigational drug therapy not yet available on prescription.

Adult Congenital Heart Disease Centre

Adult Congenital Heart Disease (ACHD) patients are complex patients with multi-faceted issues requiring integrated and coordinated care across specialities. The adult congenital heart disease service is a speciality service that provides medical and surgical treatment to patients who

were born with heart disease. This may include, abnormalities such as ventricular or atrial septal defects, anomalous pulmonary venous drainage, single ventricle, congenital mitral valve disease, bicuspid aortic valve disease in young patients and Marfan's syndrome.

The Mater multidisciplinary team (MDT) with representation from electrophysiology, the national pulmonary hypertension unit, national transplant team and the Rotunda obstetric team co-ordinates access for treatment for this complex patient group.

Hereditary Cardiac Syndromes

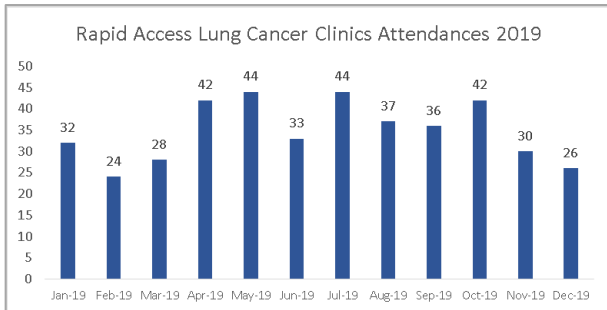
The Mater Hospital provides a national service for people with known or suspected inherited cardiovascular disease. The service diagnoses and manages the risk of inheritable cardiac risk and SADS (Sudden Arrhythmic Death Syndrome) in family run clinics. Clinical family screening can identify the cause of the SADS in approximately 25% of deaths, and genetic studies can help identify the cause in another 15-20%.

The team delivers a comprehensive evaluation for patients to understand their diagnosis and the potential genetic findings associated with the condition and provides a comprehensive education and a treatment plan based on their clinical diagnosis and specific needs. Experts in multiple disciplines including electrophysiology, cardiomyopathy, congenital heart disease, medical imaging, psychiatry and genetic counselling are brought together to provide the full spectrum of evaluation, clinical and genetic diagnostics and treatment modalities for adults and children.

Rapid Access Lung Clinics

The Mater Hospital's Rapid Access Lung Cancer Clinic is one of the busiest services in the country. The National Cancer Control Programme designated KPI for Rapid Access Lung Cancer Clinics is "% of patients attending lung rapid

access clinics who attended or were offered an appointment within 10 working days of receipt of referral in designated cancer centres”. The KPI is 95% which was exceeded by the rapid access team on every month in 2019.



Rapid Access Lung Cancer Clinic Attendances 2019

Cardio-thoracic Whole System Improvement Project

The Cardiothoracic Whole System Improvement project’s overall goals were to optimise capacity and flow through service with associated increased levels of activity. A number of key developments occurred in 2019.

The new Clinical Nurse Manager 2 focused on patient flow and continuity within the service with the following interventions

▶ Establishment and development of pre-op clinic for cardiac surgery

▶ Attendance at daily rounds and linkage with Operations Manager to facilitate patient movement through circuit and discharge

▶ Initiating improved links with patient flow departments in regional hospitals to expedite repatriation

▶ Linking with the CIT (Community Intervention Team) to set up remote monitoring of patient INR level (international normalisation ratio – used to monitor how well blood thinning medication is working) to enable earlier discharge of patients

▶ Establishment of outpatient wound care clinic enabling pro-active wound care negating the need for readmission

▶ Establishment of weekly education rehab sessions in conjunction with Cardiac rehab team

Pre-Op Clinic

The pre-op clinic for cardiac surgery patients commenced initially in pilot phase from February 2019 with full roll-out to all cardiac surgery consultants in the 3rd quarter of the year. The pre-op clinic allows full work up for patients a week in advance of surgery which will ultimately enable day of surgery admission for cardiac patients.

eReferral Portal

A successful submission was made to the Slaintecare Integration Fund for the development of a referral portal to improve effective communications and patient movement between the Mater Hospital and the referring hospitals. This will allow electronic transfer of critical information and diagnostic reports and potentially to reduce overall length of stay through the system and reduce instances of patients transferring from other hospitals who are not medically ready for surgery.

Phase 1 of the Cardiothoracic (CT) Whole System Improvement project has come to an end. It aimed at optimising CT bed usage, increasing surgical activity and improving patient experience of waiting and referral processes.

A review of current data, comparing year on year 2018 - 2019 data, showed a sustained 16% in cardiac cases since project initiation and 45 more CT bed days/ month. The next phase is the development of a nationwide eReferral portal for CT surgery.

Irish Heart Valve Bank

The Irish Heart Valve Bank (IHVB) collects, processes and stores human heart valves. The valves are donated by patients who have received heart transplants, multi-organ donors or neonatal donors. The tissue can then be used to repair congenital heart defects in other patients. Some examples of the types of surgeries that can be done using the donated tissue include

▶ Norwood operation - the initial surgery of palliation of hypoplastic left heart syndrome

▶ Ross Procedure – the surgery to replace a diseased aortic valve with living tissue

▶ Pulmonary valve replacement

▶ Aortic root replacement – endocarditis patients

The IHVB is the body licenced to collect, process and release human vascular tissue in Ireland. The IHVB is licenced under Irish and European law to perform this service. The Health Products Regulatory Authority (www.hpra.ie) are the licencing body in Ireland.

The generous donations have also allowed for the retrieval of homograft's when organs are not suitable for transplantation so that the Irish Heart Valve Bank has become nearly self-sufficient in terms of homograft availability for neonates requiring complex repairs, such as Norwood procedures or hypoplastic aortic arch repair, but also for older children and adults who need Ross procedures or aortic or pulmonary root replacements.

Critical Care, Anaesthesia, Elective Surgery, Theatres and Sterile Services Directorate

The CCAEST directorate encompasses Anaesthesia, Critical Care and Pain Medicine, the Operating Theatres and the Central Sterile Services Department and provides high quality, personalised patient care. The team at the Directorate works interdependently with the clinical teams to support patients with a diverse and complex case mix including

▶ Elective and emergency surgical patients

▶ Heart and lung transplant patients

▶ Critical care for acute medical and surgical patients

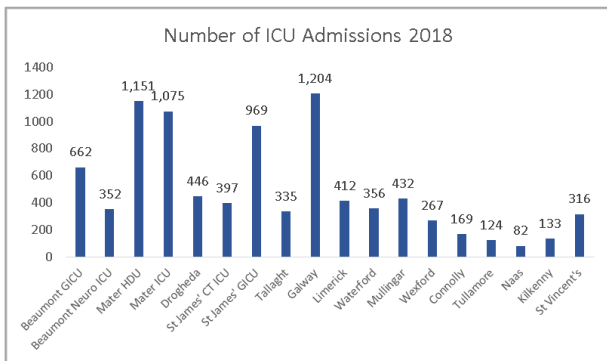
▶ Interventional cardiology

▶ Interventional radiology

Intensive Care

The Mater Hospital's critical care service includes the Intensive Care Unit (ICU) and the High Dependency Unit (HDU) and is one of Ireland's leading intensive care services. The Intensive Care service was established in response to the development of the National Cardiac Surgery Unit and the increased number of critically ill patients being cared for by the hospital. The service admits critically ill patients from all disciplines

from the Mater and Rotunda Hospitals and those referred from outside the hospital on a 24-hour basis.



Number of Admissions to each Unit in 2018
Source: NOCA Irish National ICU Audit

The Mater Hospital Intensive Care service has a central role in the provision of acute medical care for cardiothoracic surgery patients (including heart and lung transplant patients), spinal injury patients, general, vascular, hepatobiliary, and major head and neck surgery patients, cardiology, respiratory medicine, endocrine, haematology and oncology patients.

Extracorporeal Life Support Service (ECLS)

ECLS was established in the Mater in 2009 and provides advanced physiologic support for adult patients with acute severe potentially reversible heart or lung failure that have continued to deteriorate despite optimal conventional therapy. Specific equipment is required for ECLS but more importantly, continued high quality training is essential to ensure that both ICU nursing and physician staff acquire and maintain the necessary management skills to care for these very dependent patients. Approximately 15 – 25 patients are supported by ECLS in the ICU each year.

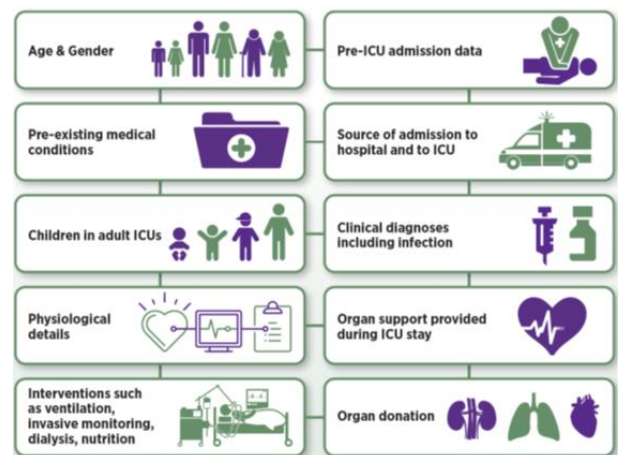
Irish National Intensive Care Unit (ICU) Audit

The Irish National ICU Audit was established by the National Office of Clinical Audit (NOCA) in

2013. It reports on the care of patients in adult Intensive Care Units (ICUs) and has the following objectives

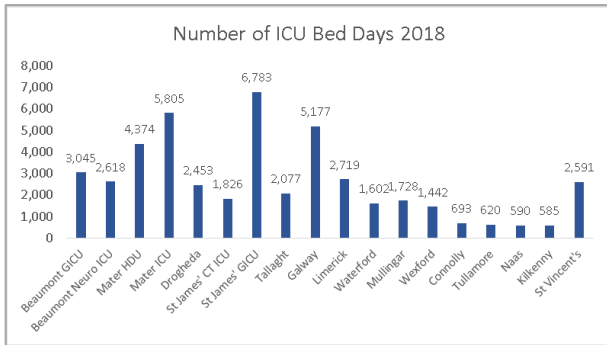
- ▶ Measure the quality of care in ICU by benchmarking outcomes
- ▶ Use the Audit to drive improvements in the quality of care
- ▶ Measure activity to inform the configuration of critical care
- ▶ Provides data to support the Hospital In-Patient Enquiry (HIPE) system and activity-based funding (ABF)
- ▶ Audit healthcare-associated infection (HCAI)
- ▶ Audit potential organ donors and organ donation

The audit captures the following information



Graphic of Data Collected through the Irish National ICU Audit

The Mater ICU is one of Ireland's leading intensive care services, providing treatment to approximately 2,200 patients each year and was the pilot site for first National ICU Audit.



Number of Bed Days Occupied 2018
Source: NOCA Irish National ICU Audit

The 2018 Irish National ICU Audit was published in February 2020 by the National Office of Clinical Audit (NOCA). The report contains data on critical care patients from 18 Units in 15 hospitals, which account for 70% of ICU activity in HSE-funded hospitals and produced the following recommendations.

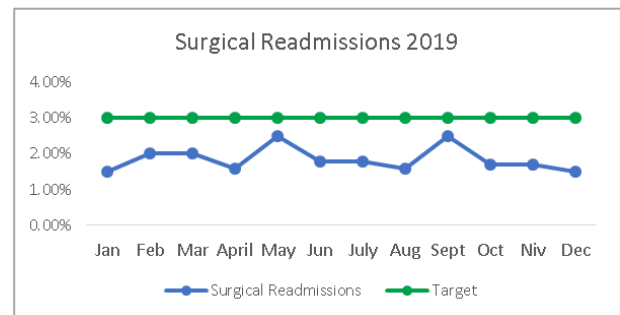
Hospital	<p>Recommendation 1: Increase bed capacity in adult Critical Care Units (ICU and HDU) towards the 430 beds recommended in the Department of Health’s Health Service Capacity Review 2018.</p> <p>Recommendation 2: Review the appropriateness of providing care for critically ill patients in Units with small numbers of patients with multiorgan failure, in line with the recommendations of the HSE Critical Care Programme Model of Care, the Joint Faculty of Intensive Care Medicine of Ireland and the European Society of Intensive Care Medicine.</p> <p>Recommendation 3: Prioritise the discharge of patients from ICU to the ward once they have been declared fit for discharge.</p> <p>Recommendation 4: Explore best practice in providing optimal care for high-risk patients outside critical care, including the potential benefits of critical care outreach teams.</p>
Organ Donation	<p>Recommendation 5: Improve the rates of organ donation after brain death in larger units.</p> <p>Recommendation 6: Improve the rates of organ donation after circulatory death (DCD).</p>
Family and Relatives	<p>Recommendation 7: Improve psychological care for relatives whose family member is in critical care.</p>

Reporting	Recommendation 8: Expand the range of reports produced by NOCA based on data already collected.
Support	Recommendation 9: Regrade ICU Audit Coordinator posts to clinical nurse manager level.

National ICU Audit 2018 Recommendations

Hospital Readmissions

Hospital readmission rates are an important indicator of patient health outcomes and of the healthcare system performance. Low readmission rates in healthcare are regarded as an indicator of effective care and efficient co-ordination of services. International studies and quality-reporting initiatives have shown that 15-25% of people who are discharged from the hospital will be readmitted within 30 days or less, and that many of these readmissions are preventable. The Mater Hospital has set the target for surgical readmissions at 3%.



Surgical Readmission Rates Mater 2019

Acute Pain Service

Poorly controlled acute pain results in increased pulmonary, cardiac, metabolic, gastrointestinal and metabolic complications. Post-surgical complications are a major cause of morbidity and mortality, in addition to increased length of stay, increased cost and patient suffering. Many techniques used for acute pain management require specialist training and intensive monitoring. The acute pain service is at the forefront of staff education and the safe delivery of care to patients. The activity of the acute pain

service has increased over the past number of years.

Chronic Pain Service

Chronic pain affects 35% of the Irish population. The role of tertiary service is to support, educate and assist primary care in managing patients suffering chronic pain. The demand for chronic pain service continues to grow.

Patients experiencing chronic pain are vulnerable, conflicted, stigmatised and often among the greatest health care utilizers. It is therefore imperative that a whole person inter disciplinary approach is adopted when assessing and managing patients with established chronic pain. As a tertiary referral centre the Department of Pain Medicine offers a neuromodulation and intrathecal drug delivery system service to patients with intractable cancer pain or severe pain from benign causes such as post-laminectomy syndrome or complex regional pain syndrome.

The establishment of the Mater Acceptance and Commitment Pain Program (MAPP) has been a major innovation in the last few years. The 8 week programme is delivered by Clinical Psychology and Physiotherapy in conjunction with the department of Pain Medicine.

Another innovative process has allowed streamlined multidisciplinary assessment of complex patients. This process was formerly performed as inpatient only. However, its expansion has had a significant impact on admissions, which have reduced by approximately 60 per annum resulting in 300 bed days saved.

EPSiLon Project

The EPSiLon Project team was formed initially to explore high levels of cancellation for elective procedures within the hospital. Multiple scheduling and cancellation processes existed.

Following this exploratory process however, it was concluded that there was

▶ Wide variation in these processes inter and intra specialty had developed over time (37 different pathways)

▶ These factors were non-value add and did not support the hospital in achieving local and national scheduling and cancellation targets

The scope of the Project was therefore expanded to include

▶ Scheduling for both Day Cases and Inpatients

▶ Cancellation Process

▶ DNA/CNA Processes

▶ Re-scheduling Process

▶ Admission Process

▶ Discharge Process

Goals

▶ Standardised Electronic source of referral both internally within the hospital and from external agencies to the Mater. (Scheduled & Unscheduled)

▶ Direct electronic referral to the pre-op assessment clinic as indicated with full electronic visibility of the various tracking steps and outcomes

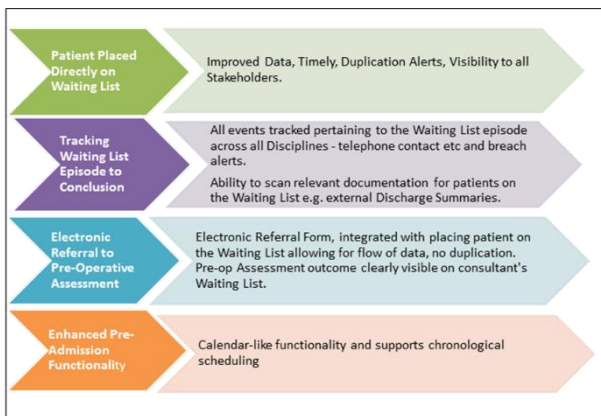
▶ Corporate confidence in the validity of cancellation, removal and suspension codes

▶ Standardised letters to Patients, GPs, Source of Referral e.g. cancellation, removal and suspension

▶ Full electronic linkage from waiting list add to scheduling, to bed booked / confirmed / pre-op referral & outcome / admission and final removal with inbuilt alerts and feasibility to scan patient documents during the full patient journey. Achieve hospital wide approach to eliminate diary usage and continuous emailing re scheduling/ admission priorities / bed booked / confirmed

In June 2019 the Hospital went live with real-time electronic Inpatient and Day Case Waiting List Management. End users have access to the electronic Waiting List Form on Patient Centre (the patient administration system), along with the ability to manage and track inpatient/day case waiting lists electronically real time. In addition, Pre-Operative Assessment Clinic referrals can now be made in Patient Centre with the ability to schedule and track each referral.

Overall, the system supports the process as follows



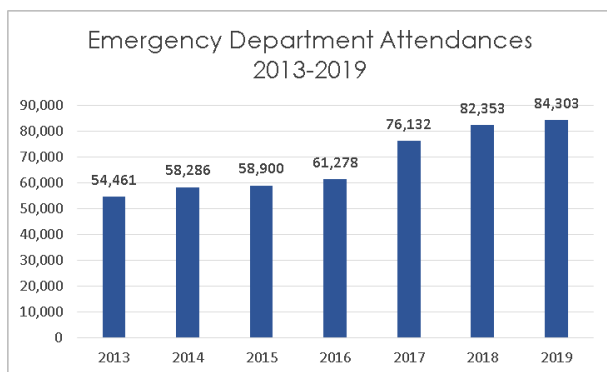
EPSiLon System Process

The overall goal is to improve the quality and safety of our Inpatient and Daycase Waiting Lists by giving users access to the right information at the right time.

Emergency and Specialty Medicine Directorate

Emergency Department

The Mater Misericordiae University Hospital has one of the busiest emergency departments in the country. Open 24 hours a day the service cares for patients with a wide variety of complex health problems including acute myocardial infarction and stroke. 2019 was the busiest year on record for the emergency department, with attendances at just over 84,000, an increase of 54% since 2013.

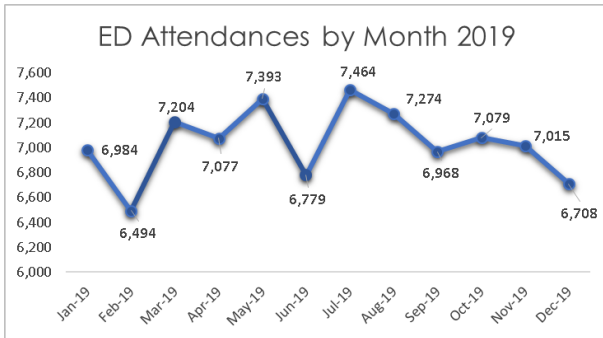


Emergency Department Attendances 2013-2019

Attendances across the services were split with 57,153 attending the main ED, 14,192 attending the Smithfield Rapid Injury Clinic and 12,958 attending the Eye Emergency Department.

Approximately 30% of those attending the main ED were triaged as very urgent.

The Eye Emergency Department is separate from the main emergency department of the hospital. You require a referral letter from your GP to attend the Eye Emergency Department (EED) or out of hours patients can call the on-call eye emergency doctor who can refer them into the EED.



Emergency Department Attendances 2019 by Month

Lean Programme for Unscheduled Care

The Unscheduled Care project is one of the major undertakings by the hospital in 2019. The whole system change approach was taken using six work-streams mapped onto the acute model. Combined, the work-streams address the impacts of unscheduled referral to or arrival at the hospital through acute assessment and management into specialty ward working and finally discharge.

The Transformation Office worked closely with the Acute Floor and Specialty Ward Project Steering Group to deliver the project and the hospital is aiming to be a future site for the HSE proposed model for development of an acute floor. A business cases for an additional 28 beds to develop an acute floor, including capital and non-capital running costs were submitted in 2018. In the second half of 2018, the project focused on those work-streams that do not require additional funding, physical restructuring or bed capacity.

The Bed on Time Project project aims to improve patient experience times (PETs) in the emergency department through system wide improvements to support patients' access to a bed on the right ward in a timely manner. The initial report out of the workshops on 5th October 2018 provided a structured implementation plan of over 20 actions.

There has been a particular focus on efficiencies in patient flow and discharge processes in 2019 including the Minimum Data Set, which focuses on timely and accurate information on patient movement and bed availability via the Flow System so that the Emergency Department, Wards and Patient Flow department have access to the same, high quality information for planning patient movements and hospital capacity. This project is now rolled out on 11 wards, with all scoring 98% or above median accuracy in December 2019.

A Weekend Discharge Pilot commenced on 11th October 2019 for 6 weeks and involved Medical Registrars providing information on expected discharges for the weekend every Friday. Facilitated by the Transformation Office and attended by Patient Flow, this provides an opportunity to flag patients for weekend review, diagnostic requirements to expedite discharge and to flag criterion based discharges.

The Transformation Office is facilitating quality improvement processes around the Navigation Hub which established at the start of October 2019. The Hub is a central forum to enhance patient flow processes to expedite discharges, admissions and interventions maximising timely scheduled and unscheduled care and providing whole hospital visibility. The 9:30 meeting provides strong operational grip on demand and expected capacity early in the day, allowing for relevant supportive measure to be initiated as required.

Care of the Elderly

Rapid Access Clinic

The Medicine for the Elderly Clinic at Charter Medical is designed for patients who are over 65 years of age. It is run in a partnership with the Mater Misericordiae University Hospital, Beaumont Hospital and Charter Medical.

The clinic is a recognised dementia friendly setting and guarantees access to patient appointments within 72 hours, upon referral from their GP. This clinic is under the governance of consultant geriatricians from Mater. The Rapid Access Clinic is a public service is fully covered by the HSE. The main reasons for referral are

- ▶ Unexplained weight loss
- ▶ Possible stroke or concern about stroke
- ▶ Falls
- ▶ Fainting and dizziness
- ▶ New onset of cognitive decline

Post-Acute Service

The Mater is an acute hospital which specialises in treating patients who have urgent short-term medical needs. With some patients, they reach a point of being medically stable but are not quite ready to go home or to a nursing home.

For these patients, we provide a specialised service called post-acute care where we provide support to patients and their family until they reach their full potential and can be discharged from hospital. The Care of the Elderly service also provides post-acute service for patients through the Synge, Yeats and Joyce units in St Vincent’s Hospital, Fairview.

Neurology

European Stroke Organisation Certification

The Stroke Unit in the Mater Hospital has become the first such unit on the island of Ireland to receive European Stroke Organisation (ESO) certification, making it just one of 19 stroke units across Europe to be certified.

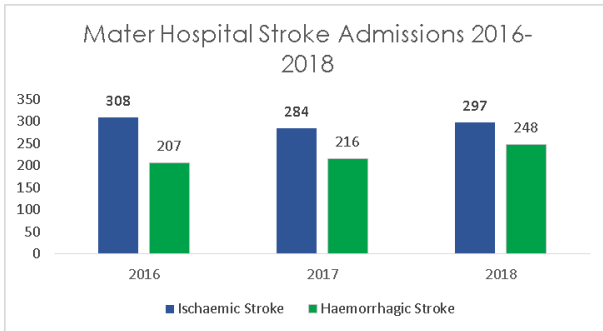
Founded in 2007, the European Stroke Organisation (ESO) is a pan-European society of stroke researchers and physicians, national and regional stroke societies and lay organisations that aims to reduce the burden of stroke by changing the way that stroke is viewed and treated.

To receive ESO Certification a stroke unit must meet a number of detailed criteria set out by the ESO that cover a stroke patient’s journey from initial assessment at the Emergency Department through to discharge and rehabilitation. These criteria include diagnostics such as MRI scans etc, treatment, multidisciplinary care; the involvement of specialist stroke doctors, nursing staff, physiotherapists, occupational therapists, speech and language therapists etc, secondary prevention and rehabilitation post stroke.

The ESO Certification process aims to

- ▶ Improve the quality of patient care by reducing variation in clinical processes
- ▶ Provide a benchmark for quality of stroke management
- ▶ Provide an objective assessment of clinical excellence – based on the *European Stroke Organisation recommendations to establish a stroke unit and stroke centre*
- ▶ Creates a loyal, cohesive clinical team
- ▶ Promotes a culture of excellence across the organization

The Mater Hospital’s acute stroke unit was set up in 2002 and was the first of its kind in Ireland. The unit provides specialist early-stage care for stroke. This includes any assessments required, as well as early rehabilitation.



National Audit of Hospital Mortality⁷ Admissions 2016-2018 for Ischaemic and Haemorrhagic Stroke

While the hospital specialises in providing acute services, focused on care for patients in the early stages after a stroke. Once the patient is medically stable, the Mater team will coordinate the patient’s ongoing care in other units including

▶ **Isolde Stroke Rehabilitation Unit A** specialist stroke rehabilitation unit located in St Mary’s Hospital in the Phoenix Park

▶ **The Royal Hospital, Donnybrook** Provide a dedicated stroke rehabilitation unit for patients

▶ **The National Rehabilitation Hospital** Based in Dun Laoghaire, the hospital provides a comprehensive range of specialist rehabilitation services

Rheumatology

Gout and Crystal Arthropathy

The Gout and Crystal Arthropathy service at the Mater Hospital provides individualised, high-quality care to patients with gout, pseudogout, and other crystal arthropathies.

The diagnosis and treatment of gout and crystal arthropathy requires a careful review of the patient’s symptoms, physical findings, and

previous testing. Once the diagnosis is confirmed, our team delivers optimal gout care with a coordinated long-term approach that involves

▶ Patient education

▶ Individualised lifestyle advice

▶ Appropriate use of anti-gout medications

Inflammatory Arthritis Service

The rheumatology team at the Mater provides an emergency review clinic that aims to quickly assess, and if appropriate, start treatment for patients with suspected inflammatory arthritis (IA). The clinic performs clinical assessments, laboratory investigations and imaging, including ultrasound examinations where indicated. This can be more sensitive than clinical examination alone for picking up the presence of inflammatory arthritis. The information from these investigations is used to optimise treatment and identify patients who are at high risk of developing erosive disease. These patients are offered treatment as early as possible, ideally within four months of their symptoms starting.

Rheumatology Research Group

The Rheumatology Research Group is a UCD based research group comprising consultants from the Mater and St Vincent’s University Hospitals. The research team has specific expertise in a wide range of musculoskeletal diseases including inflammatory arthritis, osteoarthritis, crystal-induced disease, vasculitis, connective tissue disease and sports and exercise medicine.

The clinical research programme integrates clinical and basic research and engaging with pharmaceutical industry partners to create an innovative, globally competitive translational

⁷ National Audit of Hospital Mortality 2018, National Office of Clinical Audit. Published December 2019

research facility attracting early stage clinical trials to Ireland. This Research Centre provides an integrated, multidisciplinary multi-institutional environment to coordinate clinical and basic research activities in the only IMB-certified CRC facilities in Ireland linked directly to the UCD Conway Institute.

Infectious Diseases

The Mater Misericordiae University hospital has a long tradition of being a designated referral centre for the management of infectious diseases in Ireland and has a dedicated cadre of doctors and nurses with specialty training in this area. It has been designated as the National Isolation Unit of Ireland (NIU) to deal with such contingencies.

The team at the Mater Misericordiae University Hospital also looks after a large number of patients with other infections including

▶ Hepatitis B and C

▶ Meningitis

▶ MRSA

▶ Tuberculosis

▶ Malaria

▶ HIV

PrEP Clinic

The Infectious Disease team at the Mater run a PrEP Clinic (pre-exposure prophylaxis). PrEP is a type of medication that can be taken by HIV negative people before having sex and after having sex to prevent HIV. PrEP has been shown in many studies to be safe and highly effective at preventing HIV. When taken correctly PrEP has been found to be about 99% effective. PrEP is the newest HIV prevention tool available and is best

used in combination with other HIV prevention measures.

National Isolation Unit

Ireland's National Isolation Unit is based at the Mater. The unit is responsible for caring for patients from around the country who are suffering from both hazardous and highly infectious diseases, such as

▶ Tuberculosis (TB)

▶ SARS

▶ Ebola

▶ Avian (bird) flu

▶ Viral haemorrhagic fever

It also provides essential care to people who are suffering from bioterrorism-related infectious diseases and from other infections, including HIV, hepatitis B and C, meningitis, MRSA and malaria. The unit is equipped with two high specification negative pressure rooms with HEPA filtrated individualised air-handling systems and appropriate anteroom for decontamination as outlined by the European Network of Highly Infectious Diseases.

HepCare Europe

Hepatitis C infection is a major cause of chronic liver disease and death throughout the world. Approximately 3% of the world's population is infected with hepatitis C virus (HCV). In the last few years a medical revolution has seen the development of HCV drugs, called direct-acting antivirals, which can cure almost all those who receive an evaluation and treatment.

Treatment consists of one or two pills administered orally each day for a period of often just 12 weeks. The treatment has led to cures and

reversals among those with advanced HCV-related liver disease.

HepCare Europe Project

The HepCare Europe project focuses on providing an *integrated care* model for HCV treatment based on the joint participation of primary and speciality care practitioners to allow for more efficient use of limited specialist resources.

The Mater Hospital's Hepatitis Check programme has sought to improve access to HCV testing and treatment among key risk groups, including drug users and homeless, through outreach to the community and integration of primary and secondary care services. Previous attempts to engage these patients in hospital care have previously been shown to be unsuccessful.

Health and Social Care Professions Directorate

Audiology

The Mater Hospital's audiologists provide comprehensive, collaborative and patient-centred hearing healthcare for patients. Audiologists assess patients hearing prior to consultation with the otolaryngologist, provide pre-operative and post-operative evaluations and assist in the diagnosis of hearing and vestibular problems.

The service that includes precision testing, informed interpretation, and care plan development towards workable hearing loss solutions with aural rehabilitation and assistive devices including hearing aids and cochlear implants.

Balance Assessments

The audiology services utilise a range of diagnostic tests to assess an individual's balance including

▶ Posturography

▶ Videonystamography

▶ Caloric testing

▶ Video Head Impulse Test

Bone anchored hearing aids (BAHAs)

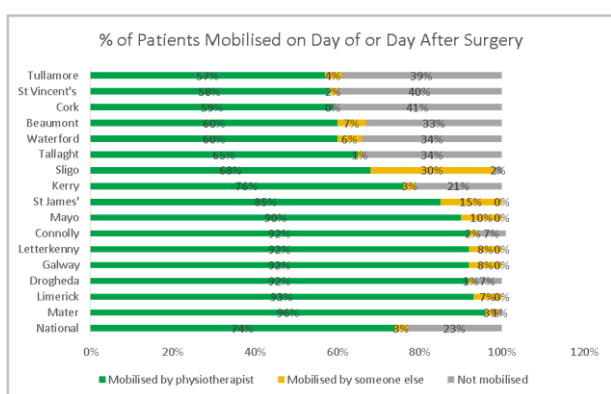
The Mater Hospital is a leading centre for bone anchored hearing aid (BAHA). The BAHA is a surgically implantable system for treatment of hearing loss. The system works by enhancing natural bone transmission as a pathway for sound to travel to the inner ear — thus bypassing the external auditory canal and middle ear. The titanium implant is placed during a short outpatient surgical procedure. Over several months, the implant naturally integrates with the skull bone. The Audiology service at the Mater Hospital is one of four leading Irish sites that provide adult patients with BAHA fittings.

Physiotherapy

The Mater Physiotherapy team provides services that develop, maintain and restore people’s maximum movement and functional ability. Physiotherapy can help people at any stage of life when movement and function are compromised by aging, injury, diseases, disorders, conditions or environmental factors – taking account of physical, psychological, emotional and social wellbeing.

Hip Fractures (Irish Hip Fracture Database)

In 2018, one research request was received and granted to examine national Irish Hip Fracture Database data from 2013–2017 and evaluate patient characteristics and patterns of care to determine their influence on patient outcomes. The first substantial piece of work has been completed examining predictors of in-hospital mortality in an Irish hip fracture population. This was undertaken by Professor Tara Coughlan, Dr Helena Ferris and Louise Brent, with support from the HSE National Quality Improvement Team. The findings, highlight that older patients, males, patients with poor pre-fracture mobility and those who are not mobilised on day one after surgery have the highest rate of inpatient mortality.



% of Patients that were mobilised by a physiotherapist or by someone else on the day of or day after surgery. Source: Irish Hip Fracture Database 2018

Early mobilisation of hip fracture patients is a key measure of the standard of care and is directly linked to better outcomes⁸. International guidelines recommend that all hip fracture patients receive a physiotherapy assessment on the day of or day after surgery⁹. The previous figure from the Irish Hip Fracture Database 2018 shows that 99% of patients at the Mater Hospital were mobilised on the day of or the day after surgery, with 96% of patients were mobilised by a physiotherapist.

Hydrotherapy Plantroom: The refurbishment of the hydrotherapy plantroom was undertaken in 2019. Hydrotherapy is an extremely useful treatment adjunct to physiotherapy that helps with pain relief and allows patients to exercise in water when this is too difficult or painful on land. Regular users of the gym and pool includes patients with Ankylosing Spondylitis, who attend weekly, to help manage their condition. In addition, students from National College of Art and Design created a new design for the changing rooms, allowing for improved patient comfort and experience while accessing the service. Phase 1 of planned work is now complete, there are two further phases to the planned work. Phase 2 involves redesigning of the changing rooms. This will allow for an increase in number of adequately sized changing rooms that will minimize delays and Phase 3 is the planned resurfacing of the interior of the pool and surrounding area.

Speech and Language Therapy

The Mater’s Speech and Language Therapy Department works with patients, to assist them in reaching their maximum potential for communication and swallowing, with a focus on evidence driven holistic intervention.

⁸ Dubljanin-Raspopović *et al.*, 2013; Hirose *et al.*, 2010

⁹ Australian and New Zealand Hip Fracture Registry, 2014; NICE, 2011; Waddell, 2011; Scottish Intercollegiate Guidelines Network, 2009

FEES Training (Fiberoptic endoscopic evaluation of swallowing)

Speech and Language Therapist (SLT)-led FEES is a well-established service in the Mater for evaluation of patients with oro-pharyngeal dysphagia. To meet training demands from SLT's in other hospital sites and to work towards standardised protocols, the SLT department organised and taught a two-day introductory FEES course in September.



Professor Susan Langmore PhD, from Boston USA, a world expert on FEES acted as an external examiner for the course. She also delivered a lecture entitled *Dysphagia Treatment for the post-radiated Head and Neck Cancer Patient: What is our best evidence*. The training was also video conferenced to Belfast and Cork, from the Freeman Auditorium. The practical component was held in the state of the art voice and swallowing clinic (Clinic 8, Whitty Building), where attendees had the opportunity to pass an endoscope on a mannequin and each other. The SLT department has sought accreditation of the course from the Irish Association of Speech & Language Therapists.

Early Supported Discharge

The department is a core element in the Early Supported Discharge for Stroke patients. This multidisciplinary team initiative, developed at the Mater Hospital, provides rehabilitation at home for people who have suffered a stroke. Speech

and Language Therapists provide high quality level of rehabilitation and support to stroke survivors with specific treatment aims of

▶ Restoring lost function

▶ Identifying and capitalising on remaining skills and abilities

▶ Teaching new skills to patients to facilitate conversation

Pharmacy and Medicines Optimisation Directorate

The Pharmacy Department at the Mater plays a pivotal role in the safe, effective and economic provision of pharmaceutical care to patients. The responsibilities of the Pharmacy Department in relation to patient welfare, value for money, innovation, service planning and strategic service delivery have adapted and expanded to meet healthcare demands of patients and their carers. The complex organisational, regulatory, research and economic considerations of the department's workload is integrated into the activities in other hospital directorates and impacts all levels in the Mater. The need for greater cohesion between all areas involved in the delivery of patient care led to the integration of the wide-ranging responsibilities of the Pharmacy Department into the hospital Directorate structure. The Pharmacy and Medicines Optimisation Directorate (PAMO) Directorate was established in July 2018.

The core services delivered within the PAMO directorate include clinical pharmacy and medicines optimisation; medicines compliance, regulation and logistics; safety, innovation and informatics, and pharmacy sterile production and cancer services.

The PAMO Directorate offers the hospital the exciting opportunity to advance even further in its delivery of process-driven, sustainable pharmaceutical care to patients. The relationship between the PAMO Directorate and the Drugs and Therapeutics Committee (DTC) is essential. The oversight provided by the DTC is an institutional priority and a key component to the provision of pharmaceutical care to Mater patients as underwritten by HIQA.

Drug Expenditure Monitoring Review Committee

The Drug Approval Application Policy and the Policy for Participation in Managed Access Programmes govern the approval of new drugs, increase in the usage of existing drugs and the use of high cost drugs for individual patients for licensed and unlicensed indications in the Mater. Those with a financial implication are reviewed by the Drug Expenditure Monitoring Review Committee (DEMRC), chaired by the Chief Executive Officer. In 2019, a total of 203 Drug Approval Applications (DAAs) were submitted to the DEMRC.

Additional actions of the Drug Expenditure Monitoring Review Committee in 2019 included

- ▶ Review and update of the Mater Drug Approval Application Policy
- ▶ Development of a Mater position on patient self-funding of drug therapies
- ▶ To maximise reimbursement and funding for drugs for the hospital from the National Drug Management Scheme (NDMS), National Cancer Control Programme (NCCP), Acute Hospitals Drug Management Programme (AHDMP) and pembrolizumab for cervical cancer patients etc
- ▶ Maximising Mater Biosimilar adoption
- ▶ Liaison with the National Centre for Pharmaco-economics (NCPE) regarding drug reimbursement for Rituximab
- ▶ Harmonisation of Nivolumab scheduling to optimise OHU capacity
- ▶ Drug reimbursement changes, e.g. high-tech drug approvals and implementation of the high tech hub and oral nutritional supplement reimbursement changes

- ▶ Liaison with the Acute Hospitals Drug Management Programme (AHDMP), HSE regarding best value biologic implementation and the appointment of the state's first Integrated Medicines Optimisation Pharmacist (IMOPT)

- ▶ The evaluation of the monthly drug expenditure *Top 70* report to identify increases in specific, or grouped, drug expenditure and/or use and follow up with clinical stakeholders, or Directorate Clinical Chair, for the careful management of drug expenditure in the Mater

Falsified Medicines Directive

The *European Commission's Delegated Regulation (EU) 2016/161 on Safety Features on Medicinal Products for Human Use* came into operation across Europe in 2019. The Delegated Regulation supplements the Falsified Medicines Directive (FMD) 2011/62/EU. Since implementation in March 2019, the Pharmacy Department must verify every medicine pack received into the Mater via the two safety features; a 2D barcode (scan for electronic IMVO verification) and visual inspection of the tamper-proof seal. The verification processes necessitated the refurbishment of the Dispensary Receipt of Goods area. The HSE recognised the impact of FMD on the functionality of Pharmacy Departments and in March 2019 two additional FMD pharmacy technicians were funded by the HSE in the Mater and other Level 4 hospitals.

Medicines Reconciliation Service

Medicines Reconciliation (MR) is the formal process in which health care professional's partner with patients to ensure accurate and complete medication information transfer at interfaces of care. The main objective of the MR Service on admission is to obtain a *best possible medication history* (BPMH). The BPMH provides a

detailed list of regular medicines including prescribed and non-prescribed, using a variety of information sources. The BPMH records name, dose, frequency and route of administration of medicines the patient is taking and may be different to what was prescribed. The BPMH is more comprehensive than a standard primary medication history. In 2019, the MR form was integrated into the Mater General Drug Chart ensuring that information of the patients BPMH is readily available at the point of prescribing.

The Mater MR Service follows the World Health Organisation High 5s Project guidelines on service implementation, including recommendations on the priority patient cohort and service measures. The priority patient cohort are patients aged ≥ 65 years admitted through the Emergency Department. The WHO recommends 3 primary service measures

▶ **MR 1** Percent of Patients with Medications Reconciled within 24 hours of the decision to admit the patient (on admission). In 2019, the average MR1 was 56%.

▶ **MR 2** The Mean Number of Outstanding Unintentional Medication Discrepancies (within the MR process) Per Patient. Both MR2 audits met the WHO targets.

▶ **MR 3** Percent of Patients with at Least One Outstanding Unintentional Discrepancy (within the MR process). Both MR3 audits were in line with the WHO target.

HIQA Medication Safety Inspections

In January 2019, HIQA published new guidance document relating to monitoring against the National Standards for Safer Better Healthcare with a specifically targeted Medication Safety Monitoring Programme. Announced inspections include assessment of the measures that hospitals have put in place to specifically manage the risk associated with certain high-risk medicines or high-risk situations where medicines are used to

mitigate these risk issues. The Mater commenced preparations for HIQA Medication Safety Monitoring Inspections. Progress in 2019 included

▶ Educating staff on drug prescribing and administration policies, protocols and guidelines

▶ Development and approval of an Emergency Tray Drugs policy

▶ Convening a Procedural Sedation policy subgroup to review and, where possible, standardise procedural sedation practice hospital-wide

An example of a risk reduction strategy is limiting access to high-risk medicines and standardisation of how these medicines are prescribed, stored, prepared and administered. Anticoagulants, e.g. heparin, and sedatives, e.g. benzodiazepines, are classified as high risk medicines, widely used in the Mater.

▶ There are a number of Mater guidelines detailing appropriate use of benzodiazepines and z-drugs. In Q1 & Q2 2019, hospital-wide ward usage of 6 specific benzodiazepines and z-drugs was reviewed. The review prompted ward based review of storage and security of these drugs.

▶ There are a number of Mater guidelines detailing appropriate use of heparin. In Q3 2019, hospital-wide ward usage of two strengths of heparin was reviewed.

Mater Policy on High Risk Drugs

High-risk drugs are associated with a heightened risk of significant patient harm when used inappropriately. A Policy on High-Risk Drugs was developed to identify and promote the safe use of high-risk drugs in the Mater. The policy identifies ten main drug groups, based on locally reported medication variances and international

references. An educational strategy to heighten staff recognition of high risk drug categories using the APINCH: High-Risk Medication List Acronym. APINCH represents Anti-Infectives, Potassium & Other Electrolytes, Insulin, Narcotics (= Opioids) & Other Sedatives, Chemotherapeutic Agents, Heparin & Other Anticoagulants. The policy highlights risk minimisation strategies, audit and guidelines / protocols which have been undertaken or are in place within the Mater, to promote safe practice with these high-risk drugs.

Drug Safety

The aim of the PAMO Drug Safety Service (DSS) is to promote patient safety, through the safe use of medication in the Mater. The DSS works with the Mater Drug Safety Committee, the Mater Drugs & Therapeutics Committee and a wide range of stakeholders, to achieve this aim. A new Drug Safety Service SOP was developed in June 2019 detailing the functionality of the service. The policy includes the Mater management and dissemination of HPRSA safety alerts that was formalised to meet HIQA recommendations.

A joint PAMO and Quality & Patient Safety interdepartmental Medication Variance Escalation Policy was developed and implemented, July 2019.

Medicine doses may be omitted or delayed in hospital for a variety of reasons. While often these events may not seem serious, for some critical medicines or conditions, delays or omissions can cause serious harm or death. A Mater Time Critical Medicines List was developed in 2019.

A Drug Safety Committee insulin subgroup with PAMO input was established in 2019. The group reviews medication variances involving insulin and drives quality improvement initiatives.

A Drug Safety Committee subgroup with PAMO input, the Medication Variance Review Group, was established mid-2019 to review medication variances causing patient harm and make

recommendations to the hospital to improve safety.

Accessing Drug Information on the New MaterNet

On behalf of the Drugs and Therapeutics Committee, the Pharmacy Head of Operations and Clinical Pharmacy Services Manager re-developed the *Information on Drugs* MaterNet content for migration to the new MaterNet Roxen platform. The Mater content was successfully reduced to the following subsections, facilitated by the availability of the functioning search capacity

▶ Prescriber's Guide (22 chapters)

▶ Intravenous Drug Protocols (87 protocols)

▶ Drug Information and Safety, incorporating the Patient Information Leaflets

Liaison with the clinical specialists was necessary to update the information available and the applicable content. Internet usage statistics between February and June 2019 identified that the Information on Drugs section was the third most popular page after the homepage and the staff bleep list.

New Mater General Drug Chart

The new General Drug Chart had been in development since 2016, with extensive multi-disciplinary input. The new General Drug Chart was developed and approved by the Drug Safety Committee and the Drugs & Therapeutics Committee and was implemented hospital-wide in May 2019. The new General Drug Chart includes a number of new (tabbed) sections

▶ Medicines Reconciliation section

▶ Anticoagulants section incorporating Venous Thromboembolism (VTE) Prophylaxis, Therapeutic Anticoagulation (parenteral and oral), Heparin Infusion section, Direct Oral Anticoagulant (DOAC) & Warfarin prescriptions

▶ Regular and Variable Dose section, e.g. for steroids or chlorthalidone reducing dose

▶ Antimicrobial section incorporating Surgical Antimicrobial Prophylaxis, Antimicrobials Requiring Therapeutic Drug Monitoring and Regular Antimicrobial prescriptions

▶ PRN (as required) section

▶ Once Only / Stat prescriptions and Intravenous Infusions and Added Electrolytes section

This was a large project that required

▶ Hospital-wide education and training, via multiple forums

▶ Extensive update of the Mater Prescribing and Administration Standards, to ensure alignment with the new General Drug Chart

A post-implementation review of drug chart use was completed in September 2019. A total of 273 general drug charts were reviewed, with an average of 16 medicines prescribed per patient (range: 1 - 41).

Approximately half the review population (51%) were prescribed at least one antimicrobial. The review identified learning points and areas for improvement.

CATO Updates

CATO® is a software system that facilitates electronic prescribing, manufacture and administration of chemotherapy. Chemotherapy prescribing errors and omissions have significantly reduced following the introduction of CATO® electronic prescribing in the Mater.

Roll Out to St Vincent's Ward

Having successfully implemented CATO® in the out-patient setting of the Oncology Haematology Day Unit in 2015, the system was further rolled out to all Haematology and Oncology in-patients in 2019. This was the final step to full integration of this medication safety tool across the Oncology Haematology Service.

CATO Substantial Upgrade

Since implementation of CATO® in 2012 the Mater has carried out small upgrades of the software. The Aseptic Compounding Unit (ACU) and IMS Department planned and implemented a substantial upgrade and a server migration during Q1 2019. This involved developing a sample database with associated review, delivery of upgrade training to medical, nursing and pharmacy staff, interface and system functionality testing and hardware compatibility checks. The final result was a successful and efficient upgrade with minimal disruption to patients and on-site training to all affected service users.

Integrated Medicines Optimisation Pharmacist (IMOP)

Medicines optimisation is a patient-centred, evidence-based approach which ensures the most clinically-effective and cost-effective interventions are utilised to improve patient outcomes. In delivering quality patient outcomes, it also provides value for money for the health service

provider by maximising benefit from available financial resources.

The HSE approved and funded the Mater appointment of an Integrated Medicines Optimisation Pharmacist (IMOP) to progress medicines optimisation initiatives in the hospital. The initial priority was implementation of the HSE Best Value Biologic (BVB) adalimumab and etanercept. Stage one necessitated implementation of the electronic High Tech Hub (HTH) for the applicable specialities, Gastroenterology, Dermatology & Rheumatology. The post was appointed on 2st June, 2019. In 2019, the achievements of the IMOP pharmacist were

▶ Co-ordination and management of 49 HTH registration forms for Mater staff, leading to one of the highest national uptakes of HTH usage

▶ Provision of HTH training to gastroenterology, rheumatology and dermatology teams

▶ Development of Patient Information Leaflets and Consultant Correspondence Letters in consultation with Medicines Information

▶ Education of patients switching to a biosimilar with provision of Patient Information Leaflets (PILs), Consultant Correspondence letters and BVB booklets

▶ Liaison with IMS and clinical staff to ensure a co-ordinated and streamlined switching to the BVB. A number of additional printers were secured for clinic rooms, to support accessibility to electronic prescribing and the HTH

▶ Liaison with the HSE regarding national initiatives and strategies for medicines optimisation

Infectious Diseases Pharmacy Service

In June 2019, the treatment of Hepatitis C in Primary Care Settings was rolled out in Dublin city. This marked a significant step forward in the goal of achieving Hepatitis C elimination in Ireland by 2030 by expanding access to treatment to a wider patient cohort. The Mater Hepatitis C Pharmacist was central to the development of Community Treatment Guidelines and the implementation process for this initiative. The Mater Hepatitis C Pharmacist sits on the Clinical Advisory Group to support those treating patients in Primary Care and continues to provide education and training to those participating in the initiative. It is hoped the success of this HSE lead initiative can lead to implementation of several Community Based Hepatitis C Treatment Programmes throughout the country.

Antimicrobial Stewardship Pharmacy Service

The Mater Antimicrobial Stewardship (AMS) Team is supported by 1.5 WTE Antimicrobial Pharmacists. The AMS programme continued to deliver on monitoring of appropriate antibiotic prescribing during 2019. AMS rounds, commenced in Jan 2018, continue on a weekly basis focussing on the use of meropenem and other antimicrobials. Just over half of meropenem courses in 187 patients were appropriately stopped by the AMS team in 2019. Greater uptake of Microbiologist recommendations was also seen. These rounds play a large part in reducing meropenem use and minimising the development of CRE in Mater.

The AMS team launched an inaugural newsletter series in March and November 2019. These newsletters outlined various aspects of AMS to NCHDs as well as updating staff on local antimicrobial resistance and prescribing issues.

Antimicrobial Stewardship Research

Antimicrobials administered to patients, prior to cardiothoracic surgery, to prevent post-surgical infections at Mater were reviewed in 2019. The Antimicrobial Pharmacist reviewed 750 patients to ensure the new choice of antimicrobials would be appropriate for the organisms observed in patients and compiled new antimicrobial guidelines following multidisciplinary input from Cardiothoracic, Anaesthetics and Microbiology.

The procedure types include CABG, Valve repair/replacement, TAVI's, insertion of permanent pacemakers or cardiac implantable electrical devices.

PAMO Awards and Achievements, 2019

Hospital Professional Awards Finalists

There were three Mater PAMO winners at the 2019 Hospital Professional Awards.

Excellence in Oncology - Ms Brid Ryan, Aseptic Compounding Services Manager. This is the second year in a row that Brid has been honoured with this award.

Excellence in Patient Safety - Ms Claire Shine, Pharmacy Lead – Medicines Reconciliation and Ms Maríosa Kieran, Clinical Pharmacy Service Manager for the MMUH Medicines Reconciliation Service.

Haematology Project of the Year - Ms Aisling Beakey, Drug Safety Facilitator and Prof Fionnuala Ni Ainle, Consultant Haematologist for the development of a combined Surgical and Medical VTE and Bleeding Risk Assessment Tool which has been included in the new General Drug Chart.



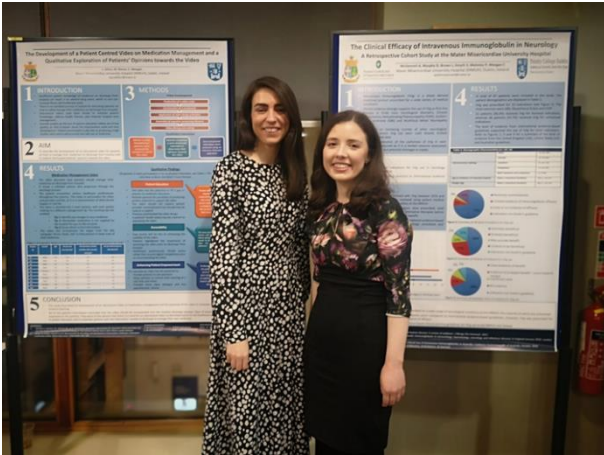
PAMO Educational Achievements, 2019

The PAMO directorate collaborated with the RCSI School of Pharmacy to develop a series of workshops for final year pharmacy students focussing on the leadership role of hospital pharmacists. The PAMO Directorate delivered seminars took place in the Mater Pillar Centre under the guidance of senior and chief pharmacists. The activities enabled the participants to appreciate the role of hospital pharmacists in clinical leadership and service delivery across the breadth of services offered by the PAMO directorate.

Aisling Beakey, Drug Safety Facilitator, delivered a lecture as part of the UCD Graduate Diploma in Healthcare (Risk Management and Quality).

Patricia Ging was an invited speaker at the International Society of Heart and Lung Transplant in Orlando on the topic *Challenges of Medication Administration in Older People*.

Aoife McDonald and Laura Dillon completed their MSc in Hospital Pharmacy theses through Trinity College Dublin. Aoife's thesis was conducted in collaboration with the neurology service and involved a review of the use of immunoglobulin. Laura's project included the creation of a video entitled *Managing your medicines when you leave hospital* which has been uploaded on the Mater website.



Laura Dillon and Aoife McDonald, Mater Pharmacists & MSc in Hospital Pharmacy, through Trinity College Dublin, Graduates 2019

Quality and Patient Safety Directorate

The Quality and Patient Safety Directorate supports the delivery of patient care that is safe, high quality and person-centred. The directorate’s work includes patient safety and risk management, quality assurance, clinical audit and quality improvement. Quality, safety and patient experience are central to everything we do at the Mater Hospital, with the hospital’s ambition to be the safest hospital in Ireland.

Safe Care	Avoid harm to patients
Effective Care	Provide effective, co-ordinated and integrated care
Person-Centred Care	Provide care that is respectful of, and responsive to, individual patient preferences

Effective Care

The guiding principle at the Mater Hospital is to continuously improve the quality of care for our patients by providing world class patient centric care across all clinical areas. Our goal of putting our patients first and always providing safe and effective care is achieved by our continued focus

on safe, effective, evidence-based care for all patients.

We continuously measure outcomes and monitor our performance to support the delivery of safe, effective, quality health care. Clinical audit forms an integral part of the clinical governance framework through which the hospital is accountable for continually improving the quality of services and safeguarding high standards of care. Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic measurement against explicit criteria and the implementation of any necessary change.

The Mater is also part of the wider national initiatives to improve the quality of care delivered and is part of several large scale national clinical audits in the following areas

- ▶ National Audit of Hospital Mortality
- ▶ National Cancer Control Programme, Rapid Access Clinic, Reviews
- ▶ Irish Hip Fracture Database
- ▶ National Stroke Register

▶ Major Trauma Audit

▶ National ICU Audit

▶ National Quality Improvement Programmes (Endoscopy, Histology and Radiology)

National Audit of Hospital Mortality (NAHM)

The National Office of Clinical Audit (NOCA) was established in 2012 to create sustainable clinical audit programmes at national level. The National Clinical Effectiveness Committee (NCEC, 2015) defines national clinical audit as *a cyclical process that aims to improve patient care and outcomes by systematic, structured review and evaluation of clinical care against explicit clinical standards on a national basis.*

Hospital level reporting commenced in 2016, and the Mater Hospital has adopted a transparent approach to the process, with the purpose of improving insight into the care we provide, utilising high quality data and ultimately improving patient outcomes.

Hospitals share their data and experiences of learning and improving from this audit. With all hospitals receiving quarterly updates that they use on an on-going basis to monitor their expected mortality ranges and to trigger prompt investigation regarding areas of concern. The National Audit of Hospital Mortality for 2018 was published on the 17th December 2019 and presents an analysis of hospital mortality across the following diagnoses

▶ Acute myocardial infarction (AMI)

▶ Heart failure

▶ Ischaemic stroke

▶ Haemorrhagic stroke

▶ Chronic obstructive pulmonary disease (COPD)

▶ Pneumonia

The National Audit of Hospital Mortality displays in-hospital mortality patterns and standardised mortality ratios (SMRs) in a national context, where hospitals have an ongoing view of their mortality data and can produce local reports. Hospitals are not compared against one another but are compared against a national average. National progress over the 6 diagnosis areas can be summarised as follows

▶ **Acute Myocardial Infarction** There has been a significant reduction (35%) in in-hospital mortality for acute myocardial infarction (AMI) over the past 10 years.

▶ **Heart failure Heart Failure** There was a 6% (not significant) reduction in in hospital mortality for heart failure over the past 10 years.

▶ **Ischaemic Stroke** There has been a significant reduction (38%) in in-hospital mortality over the past 10 years.

▶ **Haemorrhagic Stroke** There was a 17% reduction in in-hospital mortality over the past 10 years.

▶ **Chronic Obstructive Pulmonary Disease (COPD)** There was no reduction in in-hospital mortality over the past 10 years.

▶ **Pneumonia** There has been a significant reduction (28%) in in-hospital mortality over the past 10 years.

The audit uses a standardised mortality ratio (SMR) to calculate mortality trends. The SMR is a calculation of the number of patients that died within a hospital compared to the number that were expected to die when the SMR factors are taken into account.

The SMR factors are

- ▶ Age
- ▶ Gender
- ▶ Co-morbidities (other existing conditions)
- ▶ Type of admission (emergency or elective)
- ▶ Source of admission (home, nursing home)
- ▶ Number of emergency admissions (last 12 months)
- ▶ Proxy level of deprivation (medical card)
- ▶ Palliative care

Cardiovascular Disease

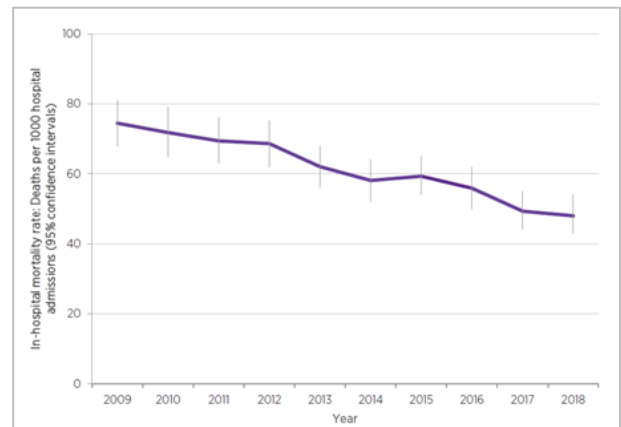
Cardiovascular disease is the number one cause of death globally, causing approximately 17.9 million deaths each year. Of these deaths, 85% are due to heart attack or stroke (World Health Organization, 2019). Cardiovascular diseases are a group of disorders affecting the heart and blood vessels. These conditions include coronary heart disease (myocardial infarction and heart attack), cerebrovascular disease (ischaemic and haemorrhagic stroke), heart failure, and rheumatic heart disease

Over the last two decades, in-hospital mortality patterns have been used internationally as one indicator of the quality of care. Several broadly similar methods have evolved, and the standardised mortality ratio (SMR) is the most commonly used approach for exploring hospital mortality patterns within a country.

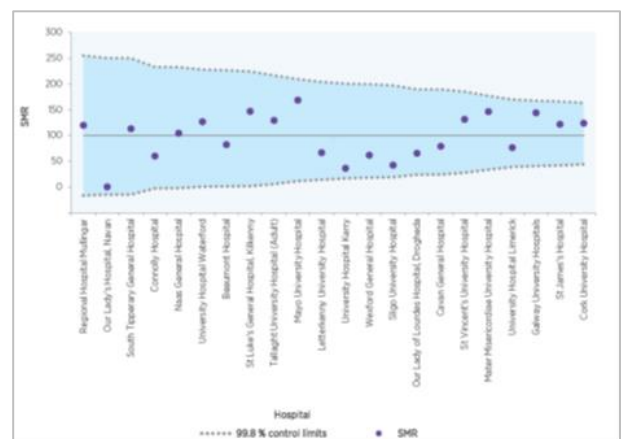
The National Audit found that the Mater Hospital was within the expected range for Standardised Mortality Ratio for all six diagnoses areas. While this reflects the quality of care at the Mater, the hospital is using the NAHM data to continuously

identify areas for quality improvement in the care we provide to patients.

Acute Myocardial Infarction

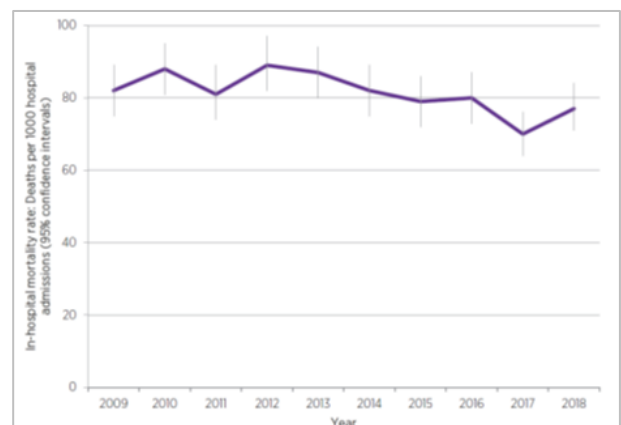


National In-hospital Mortality following admission with a principle diagnosis of AMI 2009-2018

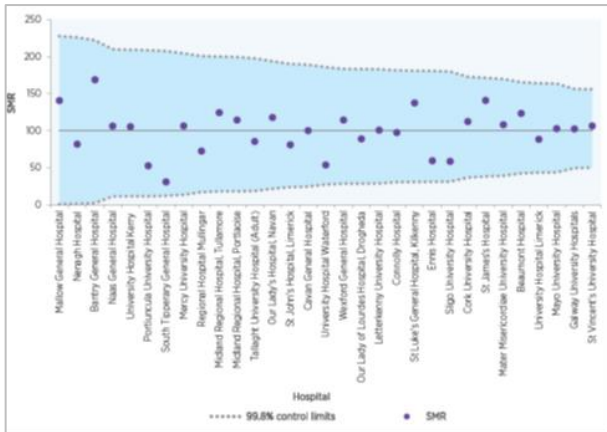


National In-hospital SMR following admission with a principle diagnosis of AMI 2018

Heart Failure

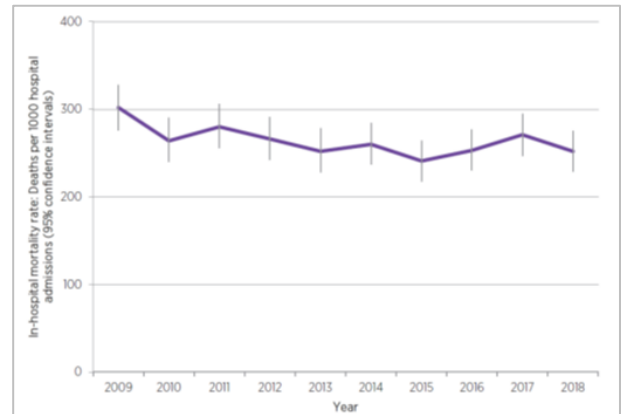


National In-hospital Mortality following admission with a principle diagnosis of Heart Failure 2009-2018



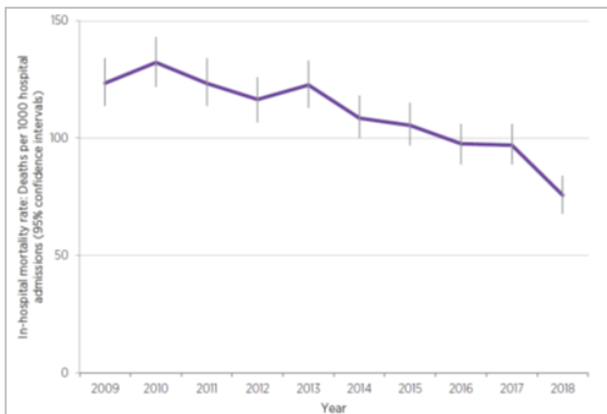
National In-hospital SMR following admission with a principle diagnosis of Heart Failure 2018

Haemorrhagic Stroke

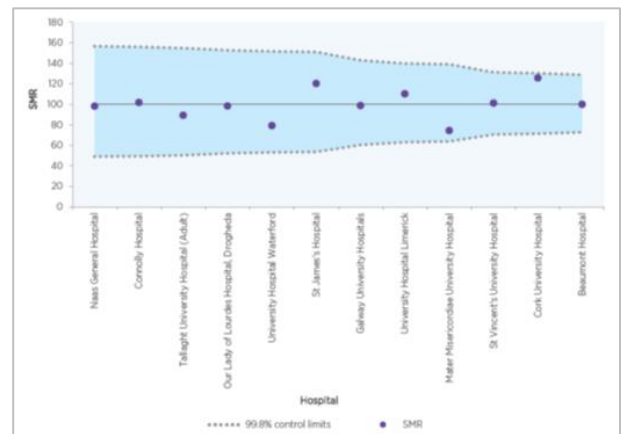


National In-hospital Mortality following admission with a principle diagnosis of Haemorrhagic Stroke 2009-2018

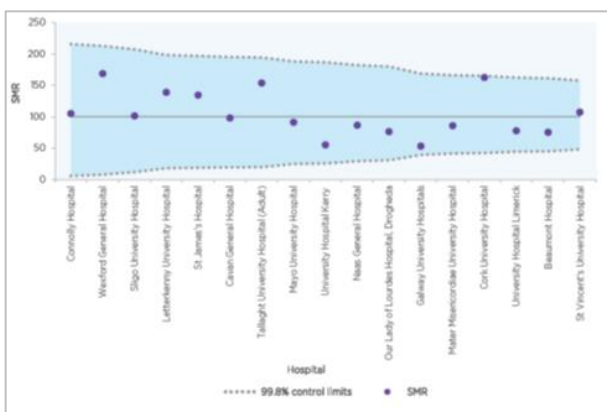
Ischaemic Stroke



National In-hospital Mortality following admission with a principle diagnosis of Ischaemic Stroke 2009-2018



National In-hospital SMR following admission with a principle diagnosis of Haemorrhagic Stroke 2016-2018

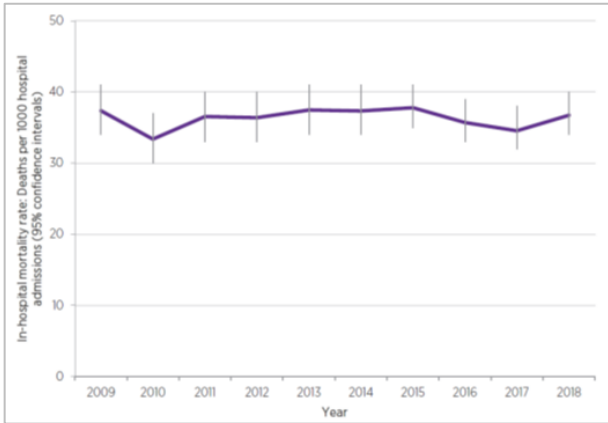


National In-hospital SMR following admission with a principle diagnosis of Ischaemic Stroke 2018

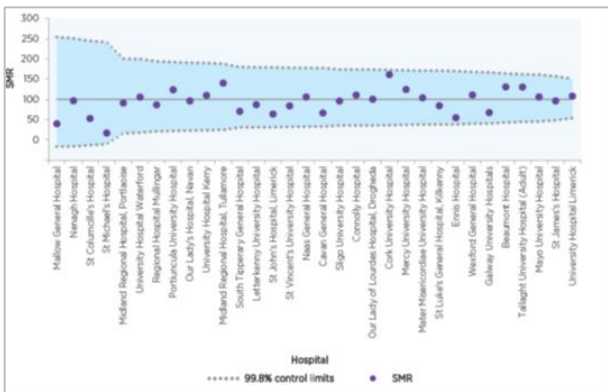
Respiratory Diagnosis

Respiratory diseases are diseases of the airways and other structures of the lung. Some of the most common are chronic obstructive pulmonary disease (COPD), asthma, occupational lung diseases and pulmonary hypertension.

COPD

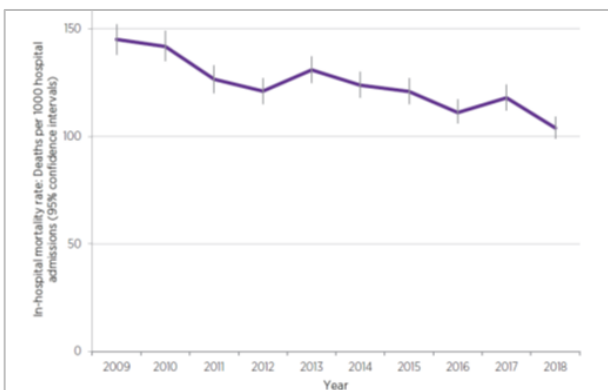


National In-hospital Mortality following admission with a principle diagnosis of COPD 2009-2018

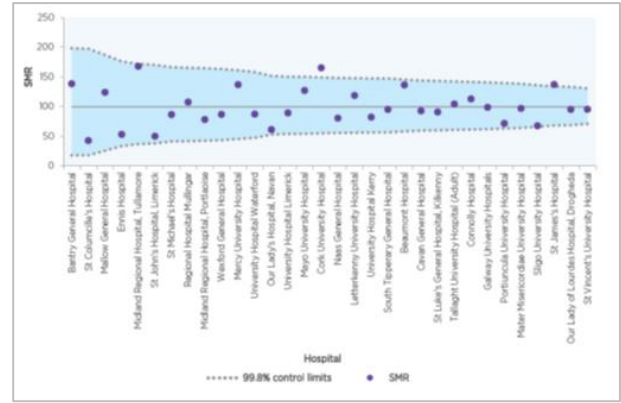


National In-hospital SMR following admission with a principle diagnosis of COPD 2018

Pneumonia



National In-hospital Mortality following admission with a principle diagnosis of Pneumonia 2009-2018



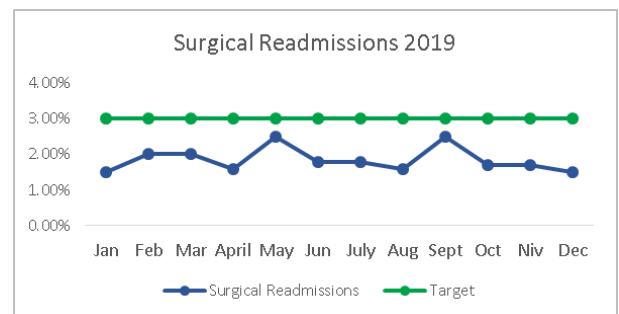
National In-hospital SMR following admission with a principle diagnosis of Pneumonia 2018

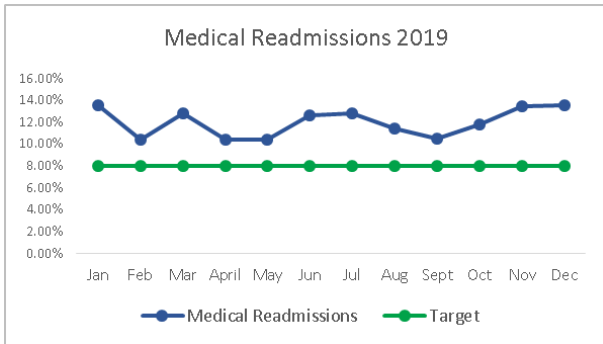
Hospital Readmissions

Hospital readmission rates are an important indicator of patient health outcomes and of the healthcare system performance. Low readmission rates in healthcare are regarded as an indicator of effective care and efficient co-ordination of services. International studies and quality-reporting initiatives have shown that 15-25% of people who are discharged from the hospital will be readmitted within 30 days or less, and that many of these readmissions are preventable. The Mater Hospital has set targets for readmissions

- ▶ 3% for surgical re-admissions
- ▶ 8.3% for medical re-admissions

Reducing readmissions is a benefit for both the patient and the hospital. The patient benefits from not requiring further hospitalised care, while the hospital benefits from not having to incur the cost and time of treating the patient again.



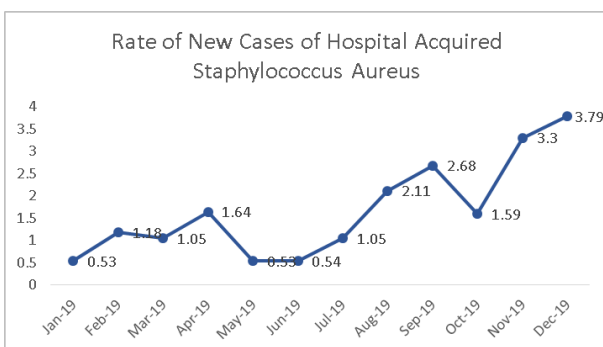


Safe Care

Infection Control

Hand Hygiene is the single most important factor in preventing the spread of infection. Frequent hand hygiene audits, which incorporate the World Health Organisation’s guidelines on the 5 Moments of Hand Hygiene, are carried out at the Mater.

Feedback is provided to all clinical areas following each audit and specific staff groups are given education when indicated. Monthly audit results are shared at a Directorate level and the hospital continues to educate and encourage all staff members to ensure hand hygiene compliance throughout the hospital. The HSE has set a target of 90% for hand hygiene.



Rate of New Cases of Hospital Acquired Staphylococcus Aureus bloodstream infections

Infection Rates

Hospital-acquired infections (HAIs) are a long-recognised problem affecting the overall quality of health care. The Mater Hospital monitors the

level of hospital acquired infections to provide quality outcome indicators and identify key measures in order to reduce the burden of HAIs. This level of monitoring enables the hospital to

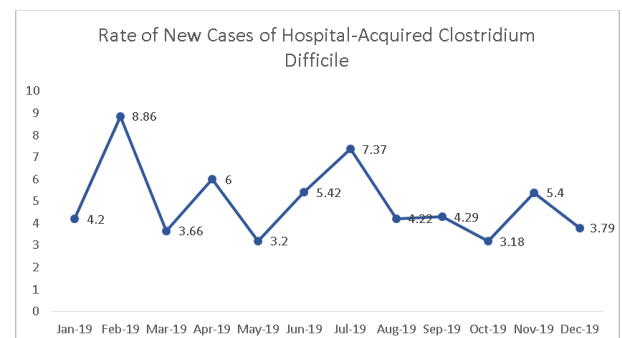
- Identify trends, including the detection of outbreaks

- Providing early warnings and investigation of infectin problems and subsequent planning and intervention and control

- Prioritise resource allocation

- Examine the impact of interventions

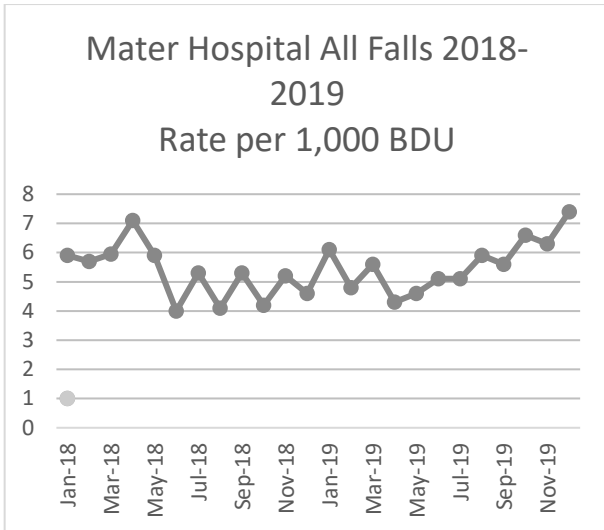
- Gain information of the overall quality of patient care



Rate of New Cases of Hospital Acquired Clostridium Difficile

Falls

Whilst it is evident from the literature that patient falls occur, it is the injuries sustained that can result in the need for surgical intervention and/or a longer hospital stay, and this ultimately can contribute to negative patient care outcomes.

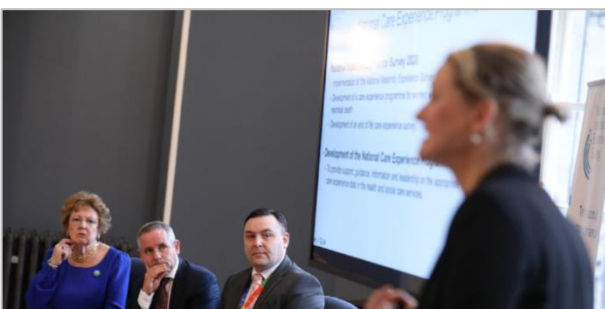


MMUH Falls 2018-2019

National Patient Experience Survey

The National Patient Experience Survey is a nationwide survey that offers patients the opportunity to describe their experiences of public acute healthcare in Ireland. The survey is a partnership between the Health Information and Quality Authority (HIQA), the Health Service Executive (HSE) and the Department of Health. The survey was conducted for the first time in 2017 and repeated in 2018 and 2019.

The results of the 2019 National Inpatient Experience Survey were launched in November 2019 in the Mater. The 2019 findings show improvements over 2018, with patients reporting more positive experiences of discharge or transfer procedures. Questions on dignity, respect and privacy scored highly, and the majority of people gave a very positive rating of the cleanliness of rooms or wards. In addition, most people said that they trusted and had confidence in hospital staff.

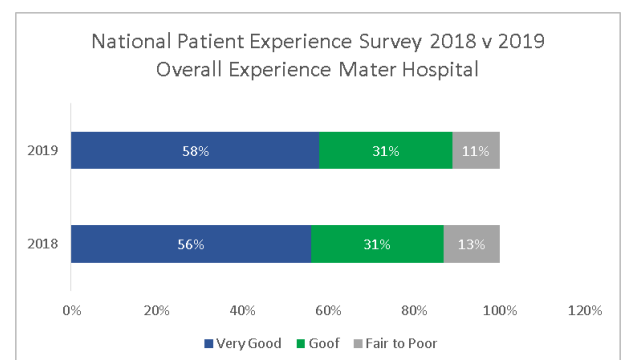


“ I would like to thank our patients, their carers’ and families for taking the time to complete the survey and for sharing their experiences of hospital care with us. It is important that we listen to and learn from our patients so that we can continue to improve patient care. I also wish to acknowledge the work of our hospital staff, who have listened to and are responding to the feedback from previous surveys, and are implementing quality improvement plans in their hospitals.”

Paul Reid, Chief Executive Officer, HSE

Survey Results

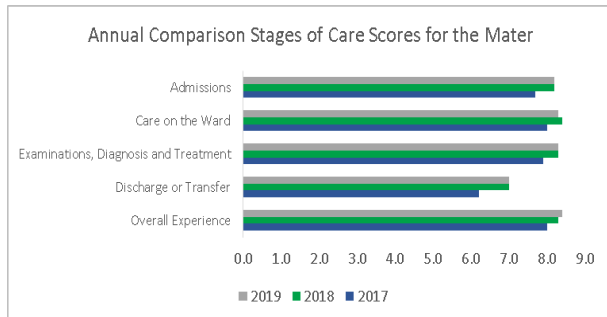
The majority of patients surveyed from the Mater reported positive experiences in hospital. 87% of participants said they had *good* or *very good* overall experiences, compared with 84% nationally. The hospital achieved significantly above-average scores for the admissions, and examinations, diagnosis and treatment stages of care, with scores that were similar to the national average for the other stages.



Overall Experience 2018 vs 2019 Mater Misericordiae University Hospital

Several areas of good experience were identified. These were areas that were related to participants’ overall experiences and where participants gave above-average ratings. For

example, patients generally had confidence and trust in the hospital staff treating them, and felt that they were treated with respect and dignity. Patients also received clear answers from nurses to their questions.

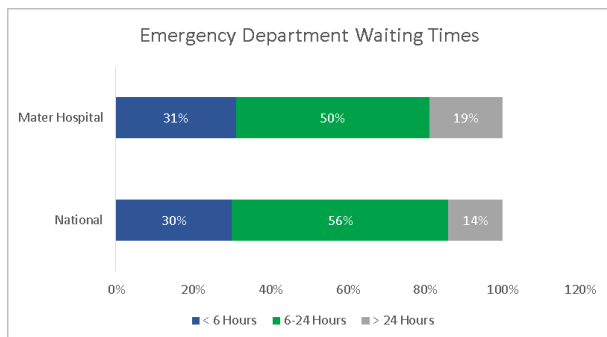


Comparison of care stage scores for the Mater Hospital for 2017, 2018 and 2019

Emergency Department Waiting Times

The HSE sets targets for the performance of acute hospitals, including targets on waiting times in emergency departments, such as

- ▶ 75% of people attending the emergency department are discharged or admitted to a ward within six hours of registration and none should wait for longer than nine hours
- ▶ 95% of people attending the emergency department aged 75 years or older are discharged or admitted to a ward within six hours of registration and none should wait for longer than nine hours



Comparison of Emergency Department Waiting Times Mater Hospital V National

Patient ratings of admission to the Mater were higher than the national average and similar to the hospital's 2018 score. Most patients said they were treated with respect and dignity in the emergency department.

Voice of the Patient

“The absolute professionalism of staff from surgeons to ordinary members — friendly and happy environment created by the friendliness displayed made me feel comfortable in my extended stay at the Mater hospital.”

“The Hospital staff could not do enough for you to help you to feel comfortable. On the night that I had my procedure I was feeling very sick and in a lot of pain and dizzy – they were there at every turn to make sure I was OK.”

“Yes the walk from admissions to theatre (through the hospital) was very humiliating. I felt embarrassed in my dressing gown and afraid I would meet someone I knew.”

The majority of participants from the Mater reported positive experiences in hospital. 89% of participants said they had *good* or *very good* overall experiences, compared with 84% nationally.

The findings have been reviewed and a Quality Improvement Plan has been developed to address the findings of the 2019 survey to help the Mater to continue to improve patients' experiences of care in the hospital.



Dr Michael Marnane (Clinical Director Quality & Patient Safety), Cora Herbert (Patient Liaison Manager) and Ruth Buckley (Quality Manager) accepted the award on behalf of the Mater Hospital staff and presented on Mater Hospital quality improvement plans

Pathology Directorate

The Pathology Directorate at the Mater Misericordiae University Hospital provides local, regional and national diagnostic services in all laboratory medicine disciplines. The Directorate is committed to providing a high quality, efficient, cost effective and comprehensive pathology service to its users who include Mater Misericordiae University Hospital clinicians, other hospitals and General Practice's in the area.

The case-mix has continued to become increasingly more complex over time and a greater emphasis on oncologic pathology (colorectal, breast, gynaecological, lung, urological and head and neck cancer) is expected to continue into the foreseeable future.

Laboratory resources are devoted to high quality analysis and reporting on these patients' biopsies and resected specimens. Significant experience has been built up over time in both the hospital's Consultant Histopathologists and Medical Scientific staff in the analysis of these specimens.

There are six departments, supported by central specimen reception and the pathology office.

▶ **Blood Transfusion** provides a routine and emergency blood grouping and compatibility testing service for surgical and medical patients and provides a stock of manufactured blood products. It includes haemovigilance and traceability functions

▶ **Clinical Chemistry and Diagnostic Endocrinology** provides a routine and emergency service in clinical chemistry and immunodiagnosics and involves the investigation and monitoring of endocrine, bone and reproductive disorders

▶ **Haematology** provides a routine and emergency service in haematology and investigates haematological abnormalities. The department also provides a routine and specialised coagulation service

▶ **Histopathology/Cytopathology** provides a diagnostic histopathology and cytopathology service (excluding cervical cytology). The service includes BreastCheck and the symptomatic breast service and the other cancer specialties

▶ **Immunology** provides a diagnostic service for the investigation of disorders affecting the immune system, including a multiple myeloma service, autoimmunity and rheumatic diseases testing, HIV monitoring, allergy investigations and immunochemistry

▶ **Microbiology** provides a routine and emergency diagnostic service in the investigation of bacterial, fungal and parasitic infection. It also contributes to disease surveillance and infection prevention and control

Designated Cancer Centre

The Mater Misericordiae University Hospital is one of the eight nationally designated cancer centres. Pathology provides a key service as part of the cancer team, with a complete and accurate pathology report is crucial to getting a precise diagnosis and deciding on the best treatment plan for each individual patient.

Patients at the Mater Hospital benefit from the experience and expertise of Mater pathologists. The pathologist determines the precise type and severity (stage) of the cancer and may also work with other members of the care team to recommend a treatment strategy that could include observation, surgery, chemotherapy, radiation therapy, or a combination of these approaches.

For most types of cancer, a biopsy is the only way to make a definitive cancer diagnosis. The most common types of biopsy include

▶ Incisional biopsy, in which only a sample of tissue is removed

▶ Excisional biopsy, in which an entire lump or suspicious area is removed

▶ Needle biopsy, in which a sample of tissue or fluid is removed with a needle

As cancer care becomes more personalised, obtaining a biopsy sample that provides enough material not only for diagnosis but for genetic analysis is critical.

The pathology report details the type of cancer involved, whether it's invasive and able to spread to other parts of the body, and how far the cancer has penetrated into surrounding healthy tissues. It also includes information about

▶ Histologic grade, which compares the size, shape, and other characteristics to those of healthy cells

▶ Mitotic rate, which details how often the cancer cells are dividing

▶ Lymph node status, which documents whether the cancer has spread to nearby lymph nodes or other organs

▶ Stage, or extent of cancer in the body based on the tumour's size, location, and spread. The pathologic stage, along with the results of other diagnostic tests, guide individualised treatment options

Next Generation Sequencing (NGS) Laboratory

The Next Generation Sequencing Laboratory was opened in the Mater Hospital in 2017. Patients and families suffering from heart disease, blindness and cancer, specifically BRCA 1 and BRCA 2 cancer patients will benefit from genetic testing provided by the NGS Laboratory.

Genomic sequencing, bring benefits to patient and treatment including

- ▶ Improved diagnostic rates
- ▶ Treatment of patients with the right drug first time
- ▶ Lengthened progression free survival
- ▶ Correct selection of patients (based on likely benefit) for clinical trials
- ▶ Identification of family members at increased risk of developing disease
- ▶ Guide clinical management decision – timing of surgery, surveillance, invasive procedures

In 2019 the Next Generation Sequencing (NGS) Laboratory in the Mater Hospital received new equipment for their bio blood bank. Purchased with funds granted by the Mater Foundation, the Lab acquired a scanner, barcoded tubes and processing software. The Lab's aim is to build up an extensive bank of patient blood samples, vital for research into blood cancers.

Patients with haematological malignancies, like Multiple Myeloma Chronic Lymphocytic Leukaemia (CLL) or Acute Myeloid Leukaemia (AML), will benefit, as the samples collected from patients will be used to test new treatment strategies and research into blood cancers. Haematological malignancies account for up to 11% of new cancer diagnoses in Ireland.

Radiology Directorate

The Radiology Directorate provides advanced imaging services to the patients and clinicians within the hospital, to GPs in the catchment area, and a tertiary care service to hospitals within and beyond the Ireland East Hospital Group. The radiology service is led by highly qualified radiologists with dedicated fellowship training from world-leading medical centres and provides a range of services include emergency, elective and urgent care for all areas of the hospital, including cancer, cardiovascular, spinal trauma and stroke.

Cancer

The Mater Radiology Directorate is one of the most advanced radiology services in the country. In cancer, diagnostic imaging is the process of producing valuable images of body structures and organs that are used to

▶ Detect cancer

▶ Determine whether the cancer has spread

▶ Assess the effectiveness of a cancer treatment plan

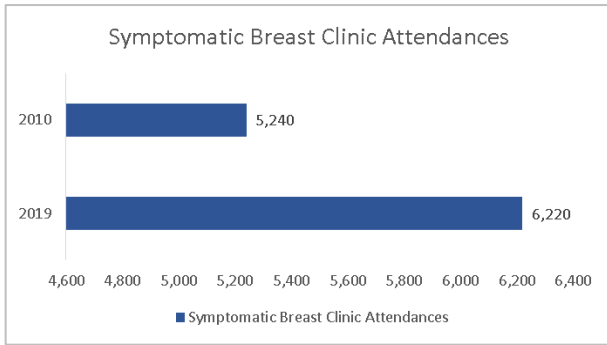
▶ Identify re-staging of existing cancer

Imaging can also be used when performing biopsies and other surgical procedures.

Radiologists are core members of the multi-disciplinary teams that plan the best treatment option for each patient. Each multidisciplinary team is a group of doctors and other health care professionals, with expertise in a specific cancer, that discuss and manage each patient's care.

Breast Imaging

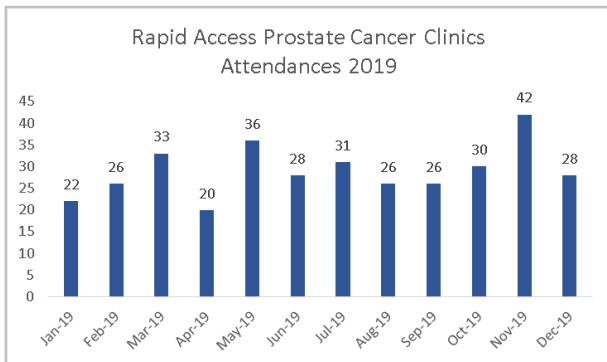
The Breast Imaging service at the Mater Misericordiae University Hospital provides comprehensive breast-imaging services, including screening and diagnostic mammography, through the Symptomatic Breast Health service. The team provide a range of clinics specially tailored to the needs of the patients including the Triple Assessment Clinics (TAC) where a woman may receive her clinical examination, radiological investigation and, if necessary, tissue sampling on the same day.



The Mater Symptomatic Breast Service is the largest Rapid Access Clinic service in the country with over 6,000 patients attended the symptomatic breast clinics in 2019. The presence of BreastCheck (the national breast cancer screening service) on the Mater campus has been a major addition to the development of one of the largest services in the country.

Prostate Cancer

The Mater Hospital employs leading edge diagnostic tests including MRI, CT, ultrasound and image-guided biopsy in the care of patients with suspected prostate cancer. The Mater provides one of the eight national rapid prostate clinics for rapid assessment and diagnosis of prostate cancer. Almost 350 patients attended the service in 2019.



Rapid Access Prostate Cancer Clinic Attendances 2019

Nuclear Medicine

Nuclear medicine is a type of medical imaging that uses small quantities of radioactive material to diagnose and determine the severity of a

disease within the body. It is also used to treat a variety of diseases. Small amounts of radioactive materials called radiotracers that are usually injected into the bloodstream, inhaled or swallowed. The radiotracer then travels through the area being examined and gives off energy in the form of gamma rays, which are detected by a special camera

Nuclear medicine imaging can provide unique information that may not be obtained using other imaging procedures and offers the potential to identify disease in its earliest stages. In the Mater, the nuclear medicine images are superimposed with computed tomography (CT) to produce special image views. These views allow the information to be interpreted with more precision.

The service provides a full range of clinically focused diagnostic and therapeutic nuclear medicine procedures, including

- ▶ Bone imaging
- ▶ Functional studies of renal and gastrointestinal physiology
- ▶ Tumour imaging
- ▶ PET/CT
- ▶ SPECT
- ▶ SPECT/CT

One unique aspect of a nuclear imaging test is its extreme sensitivity to abnormalities in an organ's structure or function. It is used in the diagnosis, management, treatment and prevention of serious disease and often identifies abnormalities very early in the progression of a disease long before medical problems are apparent.

Although nuclear imaging is commonly used for diagnostic purposes, it also has valuable

therapeutic applications such as treatment of hyperthyroidism, thyroid cancer, blood imbalances, and any bony pain from certain types of cancer.

Cardiac MRI

The Mater Hospital is a national leader in the management of complex structural heart disease. In patients with suspected structural heart problems a Cardiac MRI may be recommended.

The images produced by the use of magnetic resonance and a special dye help diagnoses structural issues including

- ▶ The size of holes in the heart
- ▶ Whether a cardiomyopathy exists
- ▶ The extent of any damage to the heart muscle

Cardiac MRI offers superior images of the heart muscle when compared to other Imaging techniques such as echocardiography (cardiac ultrasound) or CT (computed tomography) and can produce high-quality moving or still images and is usually performed to offer complementary information that other exams cannot provide.

The National Centre for Adult Congenital Heart Disease is based at the Mater Hospital.

Cardiac MRI has become the standard of reference for measurement of right ventricular volume and function. Reproducible right ventricular assessment is of particular importance in the Adult Congenital Heart Disease (ACHD) population, as clinical decisions are usually based on a change in serial data rather than single absolute values.

Interventional Radiology

Interventional radiology (IR) is a therapeutic and diagnostic specialty that includes a wide range of minimally invasive image guided therapeutic procedures, as well as minimally invasive diagnostic imaging.

The range of diseases and organs amenable to image-guided therapeutic and diagnostic procedures are constantly evolving, and include diseases of the vascular, gastrointestinal, hepatobiliary and genitourinary systems.

Interventional radiology is used to diagnose and treat patients using the least invasive techniques currently available. This minimises risks to patients and improves their health outcomes. These procedures have less risk, less pain and less recovery time when compared with open surgery. Real-time imaging techniques allow clinicians to perform minimally invasive procedures for a number of different conditions.

The priority is to treat each patient with the most appropriate treatments available which include

▶ **Tumour ablation procedures** These minimally invasive treatments destroy tissue using extreme temperatures. Ablation may be used to treat tumours or alleviate symptoms. Examples of ablation procedures are radiofrequency ablation and microwave ablation

▶ **Liver-directed therapies** This targets treatment directly to liver tumours, sparing nearby healthy tissue and reducing some side effects. Some therapies we use to treat liver tumours include Yttrium-90 radioembolization and chemoembolization

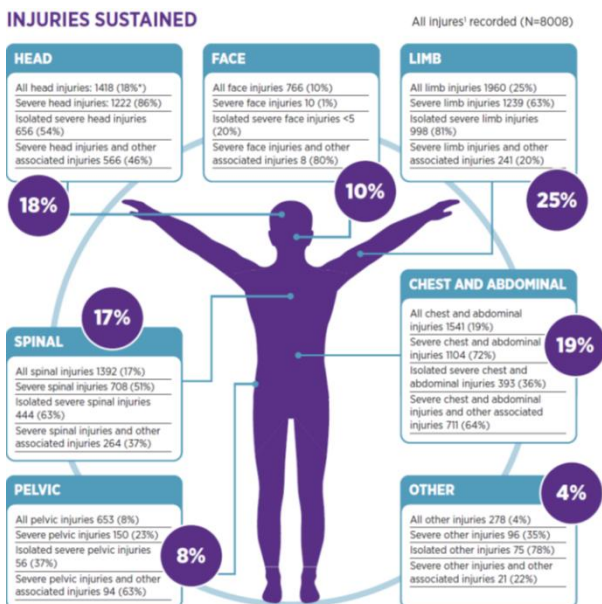
▶ **Vascular work** The Mater team uses minimally invasive techniques to place stents, stop bleeding and block the flow of blood to or from tumour tissue to support chemotherapy and radiation therapy response

▶ **Port and Peripherally Inserted Central Catheter (PICC) Line Placement** Many patients are given temporary ports and PICC lines to minimise the number of needle pricks during chemotherapy treatment or diagnostic blood work

Surgery Directorate

National Spinal Injuries Unit

The National Spinal Unit has been located at the Mater Hospital since 1991. The National Office of Clinical Audit's Major Trauma Report 2018 indicated that over 700 patients sustained severe spinal injuries in that year. The unit provides specialised, coordinated, interdisciplinary, medical and surgical care to patients with spinal cord injuries.



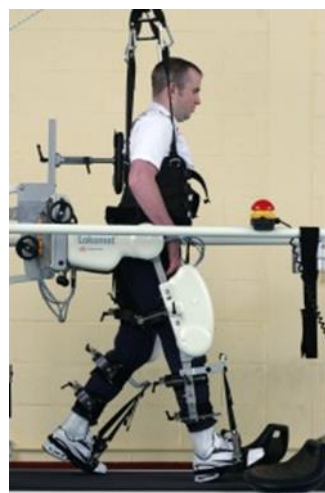
Injuries Sustained by Body Region (N= 8,008). Source: Major Trauma Audit 2018

This specialist team includes surgeons, nursing staff, physiotherapists, occupational therapists, speech and language therapists, dieticians, pharmacists and provides care for patients with

- ▶ Spinal trauma
- ▶ Spinal tumours
- ▶ Deformities
- ▶ Infections
- ▶ Degenerative spinal conditions

Spinal Cord System of Care

The National Spinal Cord Injury Service operates between the Mater Misericordiae University Hospital and the National Rehabilitation Hospital (NRH). This service provides comprehensive care for patients with spinal cord injury from the acute



episode through to their return to the community. For the majority of patients, this will be followed by a lifelong outpatient service at NRH. The service admits patients with spinal cord injury from throughout the country, and also Irish nationals

injured abroad who require ongoing treatment and care for their injury.

Robotic Surgery

Robotic surgery commenced in the Mater Hospital on the 16th April 2019 with the first robotic procedure being carried out using the DaVinci Robotic Surgery platform. To date six surgical specialities have used the robot which brings the following benefits

▶ **Urology** Significantly shortened recovery time for patients compared to both open and laparoscopic prostatectomy techniques

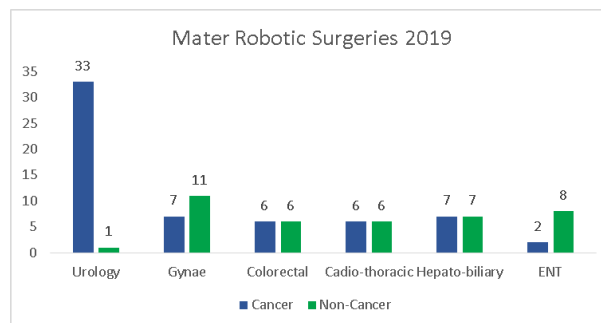
▶ **Thoracic** Tumours previously only accessible by open chest approached can now be removed via a minimally invasive approach with reduced healing times

▶ **Head and Neck Surgery** Posterior tongue tumours can be removed via the robotic approach as compared to the alternative of a very debilitating destructive open surgery with a hospital stay of 2-3 months

▶ **Gynaecology** Cancer of the endometrium in women with extremes of body mass index are ideally performed via the robot as the open/laparoscopic technique is more difficult and brings a greater morbidity

▶ **Colorectal Surgery** Very low rectal tumours usually down staged with chemoradiation have previously been extremely difficult to remove especially in the narrow male pelvis. The advanced robotic approach is ideal here

▶ **Hepatobiliary Surgery** The robotic approach is ideal for the excision of metastatic lesions in various lobes of the liver. The shortened recovery time enables patients to resume systemic chemotherapy without delay



Robotic Procedures at the Mater 2019

Colorectal Surgery

Colorectal surgery provides treatment for diseases of the colon, rectum and anus, such as cancer, diverticulitis and inflammatory bowel disease. The Mater Hospital has five colorectal surgeons, with a special interest in colorectal cancer. The hospital is one of the national rectal cancer centres. Each year, over 250 colon cancers are diagnosed and treated at the Mater Hospital.

Innovative treatments

The colorectal surgery department provides many innovative treatments to patients with cancer as well as patients with various benign (non-cancerous) conditions including

▶ **Pseudomyxoma peritonei and HIPEC** The Mater Hospital is the only centre on the island of Ireland offering cytoreductive surgery and heated intraperitoneal chemotherapy (HIPEC) for certain cancers such as appendix tumours, advanced colorectal cancers, and other rare intra-abdominal cancers. HIPEC is a highly concentrated, heated chemotherapy treatment that is delivered directly to the abdomen during surgery. Prior to 2013, patients had to travel to the UK for this treatment. The first case was completed in Ireland at the Mater Hospital in June 2013 and since then, over 60 cases have been successfully completed

- ▶ **TAMIS (Transanal minimally invasive surgery)** Transanal minimally invasive surgery (TAMIS or TaTME) provides a less invasive surgical option for patients with early stage cancer. Previously, surgery to remove these tumours required an abdominal incision. Now using innovative approaches, certain early stage cancers or rectal polyps may be removed without a surgical incision. Techniques such as this reduce pain and recovery time for patients

National Centre for Urethral Surgery

The Mater Hospital is the national referral centre for urethral reconstruction surgery (urethroplasty). The service is a consultant-to-consultant referral service with the clear majority of patients referred to the hospital by urologists from around the country.

Urethroplasty is the surgical procedure that repairs an injury or a defect within the walls of the urethra. The two main sources of patients for surgery are

- ▶ **Urethral Stricture** A narrowing of the urethra most commonly from injury, previous surgery, infection and some non-infectious inflammatory conditions of the urethra. Patients can suffer with a range of complications with some patients suffering acute urinary retention

- ▶ **Pelvic Bone Fractures** from motor vehicle trauma or crush injuries which result in urethral tears or disruptions. Often the urethra is completely torn

Patients who suffer traumatic urethral injuries (from road traffic accidents) often have associated vascular and nerve damage affecting the penis and urethra, and over half suffer erectile dysfunction as a result of the injury. A

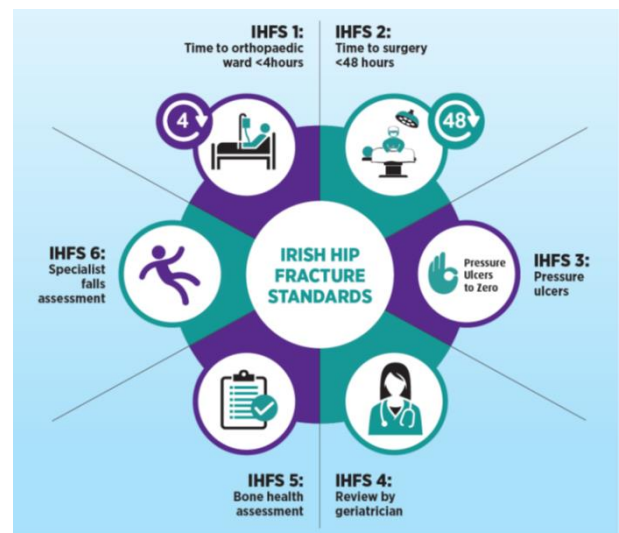
two-stage urethroplasty is indicated in patients with complex stricture disease.

Orthopaedics

Irish Hip Fracture Database

The Irish Hip Fracture Database is a clinically led, web-based audit, carried out by the National Office of Clinical Audit that measures the best practice standards (see Hip Fracture Standards below) of care and outcomes of patients with hip fractures.

The aim of the audit is to "Maintain a database of all patients in Ireland aged 60 years and over with a hip fracture in order to drive continuous quality improvement for better safer care.

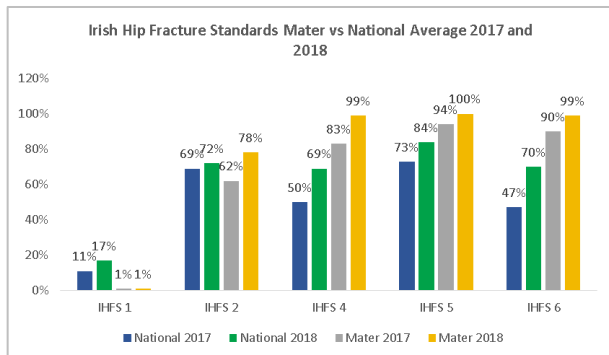


IHFS 1	Time to orthopaedic ward <4 hours Percentage of patients admitted to an orthopaedic ward within four hours of first presentation or admitted to the theatre from the emergency department within four hours
IHFS 2	Time to surgery <48 hours Percentage of patients receiving surgery within 48 hours of first presentation (and within normal working hours)

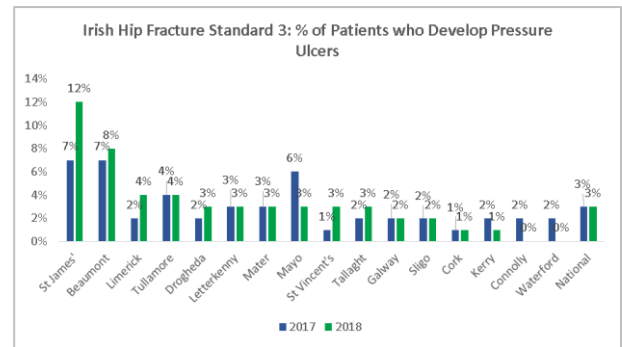
IHFS 3	Pressure Ulcers Percentage of patients developing a pressure ulcer following admission
IHFS 4	Review by Geriatrician Percentage of patients reviewed by a geriatrician at any point during admission
IHFS 5	Bone Health Assessment Percentage of patients receiving a bone health assessment
IHFS 6	Specialist Falls Assessment Percentage of patients receiving a specialist falls assessment

Irish Hip Fracture Standards

Early mobilisation of hip fracture patients is a key measure of the standard of care and is directly linked to better outcomes¹⁰. International guidelines recommend that all hip fracture patients receive a physiotherapy assessment on the day of or day after surgery¹¹.

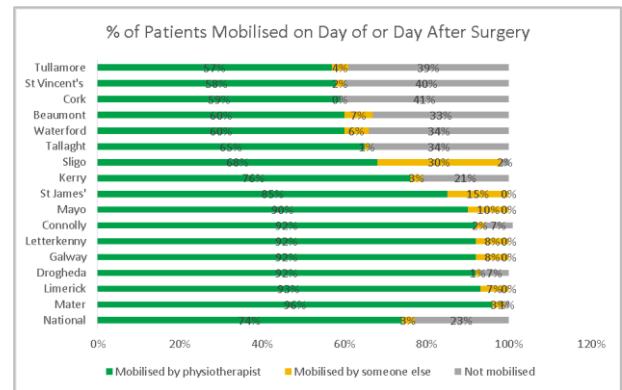


Irish Hip Fracture Standards 1,2,4,5 and 6 for the Mater Hospital performance vs National Average



Irish Hip Fracture Standard 3 - % of patients who develop pressure ulcers following admission

The figure below shows that 99% of patients at the Mater Hospital were mobilised on the day of or the day after surgery, with 96% of patients were mobilised by a physiotherapist.



% of Patients that were mobilised by a physiotherapist or by someone else on the day of or day after surgery. Source: Irish Hip Fracture Database 2018

Ophthalmology

The Ophthalmology Department at the Mater Misericordiae University Hospital is the main hub for the provision of Ophthalmology services in North Dublin and the North East area. It has established clinical links with Eye Departments in Beaumont Hospital, Children's University Hospital Temple Street, Dundalk Hospital and Connolly Hospital Blanchardstown.

¹⁰ Dubljanin-Raspopović *et al.*, 2013; Hirose *et al.*, 2010

¹¹ Australian and New Zealand Hip Fracture Registry, 2014; NICE, 2011; Waddell, 2011; Scottish Intercollegiate Guidelines Network, 2009

It is the main Ophthalmology teaching hospital for University College Dublin and is one of the main post-graduate training units in Ophthalmology and Ophthalmic surgery at both Basic Specialist Training and Higher Surgical Training levels. It also provides training for optometry students from DIT, Kevin Street.

The hospital provides a comprehensive Ophthalmology service and specialist, tertiary expertise in Retina, Glaucoma, Cornea and External Eye Disease, Eyelid, Lacrimal and Orbital Disease, Neuro-Ophthalmology, Strabismus, Cataract and Refractive Surgery.

National Programme

The National Clinical Programme for Ophthalmology (Model of Eye Care, May 2017) recommends the integration of hospital and community care, with clinicians and care providers working in teams, as the best approach to deliver care for patients and to address the structural deficits in the current system.

The efficient operation of the multidisciplinary team (MDT) is central to the delivery of primary eye care. Implementing a more community-based model will improve access to care and will help address the current adult and paediatric waiting list crisis. The Mater took a first step on delivering an integrated community care model with the development of the ophthalmology service at the Grangegorm Primary Care Centre.

Eye Emergency Department

The Eye Casualty Department service works on a Monday to Friday basis from 8am to 8pm with the consultant team on call outside of those hours. The Mater provides accident and emergency treatment for urgent, sight-threatening problems and for issues that cannot wait for a routine appointment. Patients are assessed, on arrival, by a nurse who will determine the seriousness of the condition with patients treated in a clear and prioritised manner.

Inherited Retinal Degeneration Programme

The Inherited Retinal Degeneration (IRD) programme has been running between the Mater Misericordiae University Hospital, Royal Victoria, Belfast and the Royal Victoria Eye and Ear Hospital over the last few years. This multi-disciplinary programme is co-funded by the patient group Fighting Blindness and was established to provide world class standard in IRD care at clinical phenotyping, genotyping, support and counselling level.

Sight Loss Advisors

The Mater working in collaboration with the National Council for the Blind received approval from the HSE of a Sight Loss Advisor post. The sight loss advisor (counsellor / community resource) will be based in the clinics and will support the numerous patients with marked vision impairment and blindness. The advisor will cover three weekly clinics at the Mater and will support patients at a very difficult time and guide them towards the key services and steps they need to take.

Diabetic Retinal Treatment Centre

The National Diabetic Retinal Screening Programme was introduced in 2013 to provide free regular diabetic retinopathy screen to people with diabetes. The Mater Misericordiae University Hospital is the largest Diabetic Retinal Treatment Centre. The service continues to grow as more and more patients with diabetic retinopathy attending facilitated by an overhaul of appointment scheduling.

Digital Surgery Unit

Ireland's first Digital Surgery Unit was officially opened at the Mater Hospital on 25th July 2019. The unit is a collaboration between the Mater, the Royal College of Surgeons, and IBM.

New visual and artificial intelligence technology will allow surgeons in operating theatres to make quicker and more accurate decisions, reducing post-surgery complications and significantly reducing the risk of cancers returning. This research is intended to contribute to a deeper bank of knowledge which can then be used to improve the patient experience for patients undergoing surgery.

Change Agenda

The Mater Hospital has been at the forefront of advancing healthcare for over a century and a half. Healthcare is constantly changing and providing new challenges to those delivering care. To address those challenges and to maintain and improve the care we provide, we must be always seeking out better ways of doing things. The Mater Hospital's decision to embark on an ambitious change agenda is to address these challenges and thereby transform the care we deliver.

To support the hospital through this extensive change programmes the Transformation Office (incorporating the Mater Lean Academy) was established. The office is charged with driving forward the change agenda and implementing an array of other change management initiatives.

Transformation Office

The Transformation office at the Mater Hospital supports and drives the change agenda across the hospital. It manages a number of large-scale projects relating to both un-scheduled and scheduled care. All projects have a central purpose of improving our patients' experience, irrespective of whether they are directly related to frontline care or the infrastructure and processes that support the delivery of care.

The ethos of the office is underpinned by the principle of collective leadership. It seeks to build organisational capability and capacity for change

from the ground up through investing in training and development of staff. Including facilitating the introduction of an executive leadership programme to address the ever-changing needs of managers in today's healthcare environment. The Transformation Office encompasses the Mater Lean Academy which to date has provided training to over 1,000 healthcare professionals, empowering them to employ lean principles in leading change at the frontline.

UCD and Mater Lean Academy

The mission of the UCD and Mater Lean Academy programmes are to use the principles of Lean Six Sigma management and science to improve the quality of the healthcare experience for patients, their families and staff. Our programmes offer quality improvement projects that incorporate consulting, coaching, and training services for all staff involved in healthcare delivery. The project work adopts a person-centred approach to deliver process improvement in a healthcare environment and offers a suite of Lean Programmes in Healthcare including

- ▶ **Fundamentals of Lean for Healthcare (White Belt)** Intensive One-Day introduction to Lean Six Sigma for Healthcare NMBI accreditation 6 CEU's

▶ **Professional Certificate in Lean Six Sigma for Healthcare (Green Belt)** Understand the principles and philosophy of Lean and apply them in your own healthcare organisation. Six Month, part time programme NFQ Level: 8; ECTS credits: 10

▶ **Graduate Diploma in Lean Six Sigma for Healthcare (Black Belt)** Develop process improvement, leadership, research and project management skills to drive the changes necessary for a successful Lean healthcare transformation within your organisation. 1-year part time programme. NFQ Level: 9; ECTS credits: 60

What is Lean Healthcare?

Lean means using less to do more. Lean thinking is not typically associated with healthcare, where waste of time, money, supplies, and good will is a common problem. But the principles of Lean management do, in fact, work in health care in much the same way they do in other industries. Many Healthcare organisations are successfully using Lean thinking to streamline processes, reduce cost, and improve quality and timely delivery of products and services.

Lean principles can have a positive impact on productivity, cost, quality, and timely delivery of service. While sceptics are right when they say, *Patients are not cars*, healthcare is, in fact, delivered in extraordinarily complex organisations, with thousands of interacting processes, much like the manufacturing industry. Many aspects of the Toyota Production System and other Lean tools therefore can and do apply to the processes of delivering care.

EPSiLon Project

The EPSiLon Project team was formed initially to explore high levels of cancellation for elective procedures within the hospital. Multiple scheduling and cancellation processes existed.

Following this exploratory process however, it was concluded that there was

▶ Wide variation in these processes inter and intra specialty had developed over time (37 different pathways)

▶ These factors were non-value add and did not support the hospital in achieving local and national scheduling and cancellation targets

The scope of the Project was therefore expanded to include

▶ Scheduling for both day cases and inpatients

▶ Cancellation process

▶ DNA/CNA processes

▶ Rescheduling process

▶ Admission process

▶ Discharge process

Goals

1. Standardised Electronic source of referral both internally within the hospital and from external agencies to the Mater. (Scheduled and Unscheduled)

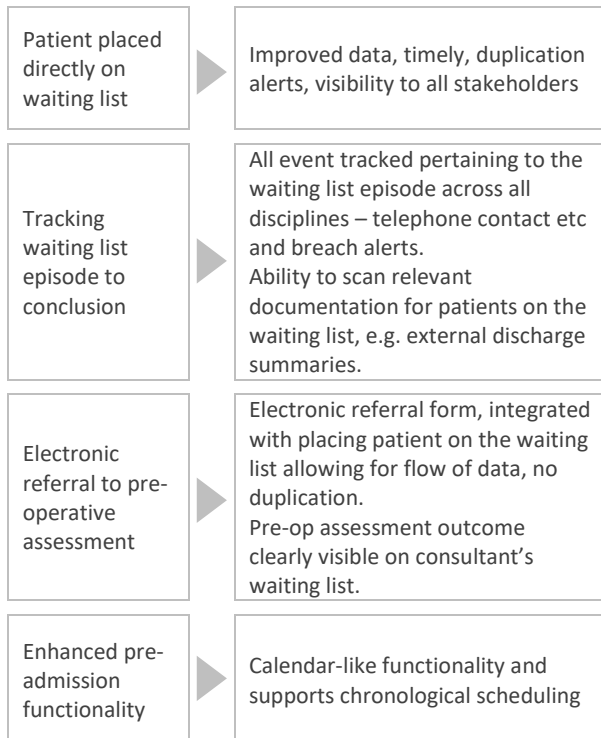
2. Direct electronic referral to the pre-op assessment clinic as indicated with full electronic visibility of the various tracking steps and outcomes

3. Corporate confidence in the validity of cancellation, removal and suspension codes

4. Standardised letters to Patients, GPs, Source of Referral e.g. cancellation, removal and suspension

5. Full electronic linkage from waiting list add to scheduling, to bed booked / confirmed / pre-op referral & outcome / admission and final removal with inbuilt alerts and feasibility to scan patient documents during the full patient journey. Achieve hospital wide approach to eliminate diary usage and continuous emailing re scheduling/ admission priorities / bed booked / confirmed

In June 2019 the Hospital went live with real-time electronic Inpatient and Day Case Waiting List Management. End users have access to the electronic Waiting List Form on Patient Centre (the patient administration system), along with the ability to manage and track Inpatient/Day case Waiting Lists electronically real time. In addition, Pre-Operative Assessment Clinic referrals can now be made in Patient Centre with the ability to schedule and track each referral. Overall, the system supports the process as follows



The overall goal is to improve the quality and safety of our Inpatient and Daycase Waiting Lists

by giving users access to the right information at the right time.

IBEC's Lean Leadership Programme, October 2019

Driving Operational Excellence through Lean Leadership

In October the Mater Lean Academy was host to IBEC's Lean Leadership Programme. This programme, run in conjunction with LBS Partners and the Irish Medtech Association End-to-End Advanced Manufacturing Working Group, is now in its seventh year and focuses on hands-on learning delivered with practical immersions in workplace settings.

The course is delivered over eight and a half days in different Lean environments. The October session was delivered over 2 days here in the Mater Hospital's Pillar Centre for Transformative Change. Participants all worked in the areas of medical device technology and manufacturing.



The programme's objective is to provide delegates with the ability to explore the theory of Lean and the key concepts which constitute Lean from the point of view of Lean practitioners. It looks at the relationship of the principles and philosophy of Lean with other improvement approaches such as Six Sigma, Shingo and TPM. In the Mater the focus was on the strategic, operational and people aspects of Lean Leadership, with an emphasis on sustainability and applying Lean in different environments.

Masterclass with Mark Graban, November 2019

In November the Mater Lean Academy was delighted to host Mark Graban, internationally recognised Lean Consultant and author, who presented a masterclass to 40 Mater lean champions as part of his current European tour. Mark has worked with executives and frontline employees, in manufacturing and healthcare, to practice methods including Lean management, continuous improvement, statistical methods, and person-centred leadership approaches. He enjoys working with organisations that are looking for better ways to improve, with leaders who are willing to lead that change. His books includes Lean Hospitals, Healthcare Kaizen: Engaging Frontline Staff in Sustainable Continuous Improvements, Practising Lean and Measures of Success: React Less, Lead Better, Improve More.

Shingo Discover Excellence

Mater Lean Academy hosts first programme in an Irish Hospital

The Shingo prize is named in honour of Dr Shigeo Shingo, who was instrumental in developing the world-famous Toyota Production System, dubbed the Nobel Prize of Manufacturing by BusinessWeek, the Shingo Prize was established in 1988 at the Jon M. Huntsman School of Business at Utah State University as a way to recognise great organisations worldwide, and to set a world standard for Enterprise Excellence.

The Shingo prize measures an organisation's successful establishment of a culture anchored on principles of operational excellence based on the understanding that enterprise excellence is much more than the application of lean tools, which aligns with the Mater Lean Academy approach to Lean and Six Sigma as being more than a toolset, but a methodology, and through our research, a philosophy to approach change in a person-centred way.

In 2013 the Shingo Institute formed a collaborative partnership with SA Partners to bring this knowledge to a wider global audience. Since then, SA Partners has been helping to update and improve Shingo related courses and the consulting support activities offered to organisations.



In May, the Mater Lean Academy hosted SA Partners first Shingo Discover Excellence programme in an Irish Hospital. This two day practical workshop, led by Prof. Peter Hines covered the Shingo principles of enterprise excellence, demonstrating how these principles drive behaviour to deliver cultural change. The event was hosted in the Pillar Centre.

Dublin North City Frailty Event

Over 110 staff from acute, ambulatory, primary and social care services from the Mater catchment area participated in a Dublin North City Frailty Event in the Pillar Centre for Transformative Healthcare over three days in October. This event brought together community and Mater staff with a view to integrating services for frail older people. Over the three days, participants shared their experience of current care and developed a shared vision of optimal care.

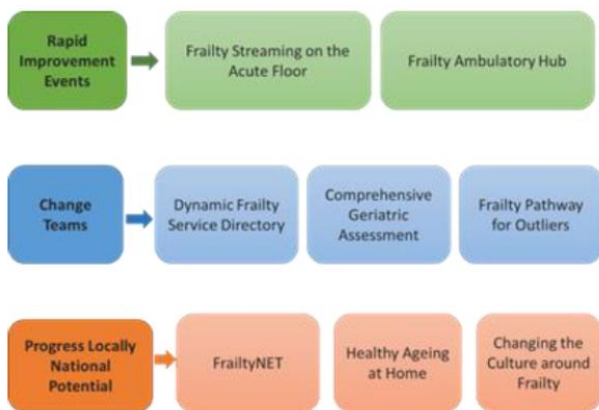
Day one involved presentations from Mater and external partners on current practices. Participants then broke into teams, mapping care pathways, validating available data, reviewing

patient journeys and highlighting challenges for future improvement.

Areas reviewed included

- ▶ Primary and social care pathways for frail older persons
- ▶ Frailty on the acute floor
- ▶ Inpatient pathway for frail older persons
- ▶ Ambulatory care for frail older persons in Dublin North City

On day two Sandra Tuohy, Assistant National Director in the HSE Services for Older People presented on Ideal Care for Frail Older Persons. Themes from day one were brainstormed for solutions and six key areas for intervention, with the following suggested methodologies for implementation, were identified



On day three Liz Sargeant, NHS Lead for Social Care Integration challenged our thinking with a stimulating talk entitled Think Home First. The debate which followed highlighted cultural and operational opportunities for change. Graduation 2019

Graduate Diploma in Lean Six Sigma (Healthcare)

Post graduate students from UCD, Ireland East Hospital Group, RCSI Hospital Group and Dublin Midlands Hospital Group received their Graduate Diploma in Lean Six Sigma (healthcare) at the UCD ceremony in March. The students now have the ability to become process and quality improvement leaders within their own Hospital groups, leading and innovating on change. Other students continue on their Lean Six Sigma pathway as they take their process improvement journey through the MSc Leadership, Innovation and Management with UCD. This year, UCD SNMHS were delighted to partner with Novartis to commence and present the first UCD Lean Six Sigma award to the process improvement graduate who had demonstrated both project outcome/s and academic excellence. The award sponsors further modules on the MSc pathway.



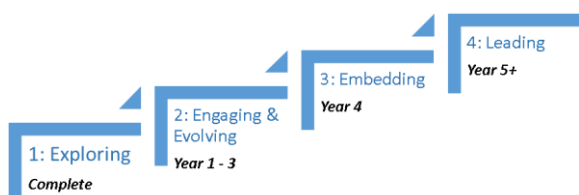
Aileen Igoe, Lean Manager MMUH/Adjunct Assistant Professor UCD SNMHS/ / Kieran McDonnell, Transformation Office/HSCP Directorate MMUH/ Liz Greene - Novartis Lean Six Sigma Award winner 2018, Clinical Skills Manager, UCD SNMHS /Seán Paul Teeling, Programme Director/Assistant Professor

Innovation

At the request of the Strategic Board, the Transformation Office led out on a consultation process to inform the development of a new innovation function for the hospital. Findings and recommendations were presented to the Strategic Board in February which agreed

- ▶ A new innovation function to be created and incubated within the Transformation Office for a minimum of two years. At that point, specific elements may become independent entities outside of the Transformation Office

- ▶ The innovation function will evolve iteratively over the next five years as follows



An Innovation Manager was appointed in June 2019 to lead on the evolution of this new function and the core business of the Innovation function will be across three domains

- ▶ **Culture, Systems and People** The innovation function will build on the Design Week initiative to embed *Design Thinking* culture and capability across the organisation. Design thinking complements Lean methodology and the two together will provide the hospital with uniquely holistic transformation capability. Where Lean excels at systematic, incremental process re-design through deep analysis and data, Design Thinking draws on the designer's toolkit, promoting creativity and enabling fresh and often more radical solutions to emerge

- ▶ **Enabling technologies** The innovation function will leverage opportunities to transform services through the application of digital and other enabling technologies

- ▶ **Medical devices & commercial innovation** The innovation function will build a robust network across the hospital, industry and academia to accelerate the hospital's engagement with medical device innovation

Innovation funding streams

StrokeLINK

Slaintecare funding has been secured for this initiative which innovates care after stroke by providing a holistic support system that will move

with the patient through the acute phase and into the community via

▶ Two stroke clinical nurse specialists (CNS) who will act as *keyworkers*, supporting patients from their acute hospital stay through to community living

▶ Personalised education and support tools which will consist of complementary digital and more traditional (e.g. paper-based) tools co-designed with patient representatives, healthcare professionals, interaction designers and a software provider

This project is a collaboration between the Mater stroke service (led by Dr Michael Marnane), the Transformation Office and National College of Art and Design.

HeartFlow

The Cardiothoracic Transformation Project identified a need for a web based clinical portal to streamline referrals into the Mater Hospital for cardiothoracic surgery. The desired solution would be similar to the existing and successful Spinal Portal. Funding has now been secured through the Spark Consultant Led Innovation fund and contract negotiations are underway. The new portal – *Heartflow* will build on SpinalPortal, expanding functionality, making it more user-friendly and ultimately transferrable to other specialties that refer into the Mater and for patient/carer use.

Design for Innovation in Emergency Services

A new and more ambitious collaboration with National College of Art and Design was carried out across November and December 2019. This five week design sprint saw 18 design students working in close collaboration with the Emergency Department to explore ways of redirecting avoidable ED presentations and to improve the arrival experience for patients

coming into the Emergency Department, in particular, frail older people. A series of novel and exciting solutions were presented at a showcase event in December. The Transformation will now work with ED staff to drive forward the most promising of these solutions.

Small Business Innovation Research scheme - Falls project

This project was initiated by the Mater Falls committee with support from the Innovation Manager and the Clinical Nurse Manager for Innovation, Technology and research. The project aims to reduce incidence of falls, harm from falls and resulting cost to the organisation (bed days plus human and diagnostic resources). €200k funding was secured through the Enterprise Ireland Small Business Innovation Research scheme, whereby Irish SMEs will be funded to research novel solutions to this currently unmet and pressing need.

Good Problems Roadshow

In August 2019, the Innovation Manager commenced a *Good Problems* roadshow around the hospital. This involves small group sessions in various departments around the hospital to explain to staff what the new Innovation function is about and how it can support staff to solve innovation challenges or to progress solutions that they may have in mind. The focus on the value of identifying *good problems* as the foundation of needs-led innovation. The aim is to encourage staff to come forward with ideas even when they are very early stage.

Artist in Residence Programme

A pilot Artist in Residence Programme was established in September 2019. The aim of the programme is to create connections between artists and the clinical community and vice versa. With this pilot programme, we have a unique opportunity to explore how such connections might help stimulate conversations about the role of the arts and creativity in healthcare and

healthcare innovation. Our first Artist, Navin Hyder, took up her six month residency in September 2019. The hospital will provide Navin with studio space in the Misericordiae building. The hospital will also facilitate introductions to staff and access to areas of the hospital to provide stimulation and inspiration for her evolving work. In return, Navin will share her work with the hospital through displays/exhibitions and she will also help us to develop and promote an ongoing residency programme for the Mater.

Navin's key area of interest is around cancer and surgery and to enable her to explore this, she has observed in the colorectal operating theatres and carried out cadaveric studies - with permission and ethical oversight by Prof of Surgery, Ronan Cahill and Prof of Anatomy, James Jones (UCD). Plans are underway for her to observe Pathology staff working with resected specimens as well as observation in outpatient clinics such as ENT/Head and Neck Cancer. Navin exhibited some early pieces at Culture Night which generated significant interest.

The goal now is to work toward a public exhibition of work at the hospital in 2021 and to enable this, Navin's contract has been extended for an additional 18 months taking her up to September 2021. During this time, Navin will also work with the hospital to evaluate the process and develop a plan for an ongoing residency if deemed desirable.

Education

The Mater's academic partnership with University College Dublin goes back to the foundation of the hospital, covering undergraduate and postgraduate programmes and in recent years the development of the lean programme in healthcare, in the form of the Mater Lean Academy. The Mater continues to work closely with UCD to provide high-class undergraduate, postgraduate and specialist training programmes in surgery, medicine, nursing, physiotherapy and radiography.

The Mater also works closely with other institutions including Trinity College and Dublin City University and provides clinical placements and internships to hundreds of students every year, including pharmacists, nurses, clinical therapists, radiographers, psychologists, podiatrists' audiologists and lab technicians.

Undergraduate Education

The Mater is the primary location for clinical education for the final two years of the UCD undergraduate Medicine Preprogramme and hosts approximately 250 undergraduate students each year for training in medicine and surgical specialities. The medicine and surgery curriculum is coordinated through the UCD team at the Catherine McAuley Centre and includes rotation through the Mater, Cappagh National Orthopaedic Hospital, the Beacon Hospital, the Midlands Regional Hospital Mullingar, Wexford

General Hospital, St Michael's Hospital and St Columcille's Hospital.

Student facilities at the Mater Hospital were further expanded in 2014 with the opening of the UCD Mater Hospital Education and Training Centre on the 3rd floor of the historic original Mater building. This represented a significant investment by UCD in sustaining the mission of education and scholarship intrinsic to the ethos of the Mater, UCD and the Sisters of Mercy. The restoration of an in-hospital *residence* area for doctors in training has further integrated our students into the hospital's campus, culture and heritage.

Postgraduate Education

The Postgraduate Medical Centre, located within the Catherine McAuley Centre, provides high quality, dynamic and innovative education programmes for consultants, NCHD's and the North Dublin Faculty of the Irish College of General Practitioners. The centre strives to exemplify the Mater Hospital's commitment to outstanding training for medical professionals.

The centre plays a key role in providing for the training needs of NCHD's and facilitates the professional development of consultants within the hospital and beyond by developing a programme of continuing medical education relevant to medical staff in the Mater Hospital including in house multidisciplinary meetings and

regular teaching sessions designed for Interns and SHOs as well as providing education sessions to members of the North Dublin ICGP.

All meetings overseen by the Centre of Postgraduate Medical Education are recognised and accredited by governing bodies such as RCPI, RCSI and ICGP.

Nursing Education

The Mater Hospital has been providing the highest quality nursing training since 1891. Nurses are offered a wide range of courses and subjects with the Centre for Nursing Education providing for both undergraduate and postgraduate education with specialist postgraduate programmes and professional development.

Centre for Nurse Education

Through the Centre for Nurse Education (CNE) and clinical placements on the Mater Hospital campus, the Mater provides a wealth of clinical expertise and rich clinical learning opportunities for nurses. Through our close partnership with UCD and DCU we provide a variety of postgraduate and undergraduate nursing programmes. The central location on the hospital campus helps to ensure that our courses reflect and respond to current patient and service needs.

The Centre is a purpose-built building with a central focus on the provision of continuous professional nursing education, specialist nurse education, in-service days and professional education courses for registered general nurses and other health care professionals. Specialist

Postgraduate Nursing Programmes

The Centre offers many specialist postgraduate programmes facilitated by specialist experts and run in partnership with UCD. These programmes are one year in duration and include

▶ Graduate Diploma Critical Care Nursing: Cardiovascular Nursing

▶ Graduate Diploma in Cancer Nursing

▶ Graduate Diploma in Critical Care Nursing: Intensive Care

▶ Graduate Diploma in Peri-operative Nursing

▶ Graduate Diploma in Emergency Nursing (Adult)

▶ Graduate Diploma in Diabetes Care

▶ Graduate Diploma in Pain Management

Mater Lean Academy

The Mater Lean Academy are a team of healthcare professionals fully qualified in Lean Six Sigma who are committed to improving healthcare processes for patients and staff. The Lean Academy has trained over 2,000 healthcare staff in process improvement methodologies and supervised over 100 healthcare process improvement projects in over 50 different healthcare organisations around the country. All of the projects have as their primary goal a direct patient benefit or outcome in addition to cost savings.

The Mater Lean Academy and the UCD School of Nursing, Midwifery and Health Systems have a range of university accredited part-time programmes. The programmes offer a flexible educational pathway to a MSc in Leadership, Innovation and Management for Healthcare. The different programmes are tailored to suit different levels of experience and are suitable for all staff, clinical and non-clinical.

The mission of the UCD and Mater Lean Academy programmes are to use the principles of Lean Six Sigma management and science to improve the quality of the healthcare experience for patients, their families and staff. The programmes offer

quality improvement projects that incorporate consulting, coaching, and training services for all staff involved in healthcare delivery. The project work adopts a person-centred approach to deliver process improvement in a healthcare environment and offers a suite of Lean Programmes in Healthcare including

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▶ **Graduate Diploma in Lean Six Sigma for Healthcare (Black Belt)** Develop process improvement, leadership, research and project management skills to drive the changes necessary for a successful Lean healthcare transformation within your organisation. 1-year part time programme. NFQ Level: 9; ECTS credits: 60

In December, 41 students from 8 different Irish healthcare organisations celebrated their academic achievement and received their Professional Certificates in Lean Six Sigma for Healthcare. The graduation ceremony was held in the Pillar Centre for Transformative Healthcare, Mater Hospital.

The Pillar Centre for Transformative Health

The Pillar Centre for Transformative Healthcare, opened in November 2018, is a unique, flexible, interdisciplinary educational space within a hospital setting. The Centre houses facilities for clinical research, genomics, bio-banking, interdisciplinary team training and education.

The next phase of development will include state-of-the-art simulation facilities including a *wet lab* and a device development space, which will focus on advanced postgraduate education and surgical skills training. These facilities will enable the development of training courses for healthcare professionals. They will also allow for engagement with industry to progress the development and deployment of new and innovative solutions within healthcare. It is anticipated that this phase of development will be completed by January 2021.

Collective Leadership

The Collective Leadership for Safety Cultures (Co-Lead) programme was launched in the Mater Misericordiae University Hospital in 2019. Co-Lead is a research project at UCD that aims to develop and test the impact of collective leadership on patient safety cultures. The Co-Lead programme is based on the premise that healthcare is delivered by teams and therefore it is important that every team member's expertise and knowledge is leveraged, recognising that all team members play a vital role in quality and patient safety. Co-Lead enables teams to lead collectively, sharing responsibility for team performance and patient safety.

The programme was co-designed by healthcare staff, patient representatives and researchers. It comprises 19 components, eight of which should be completed by teams: six core components related to collective leadership for team performance and safety culture, and two additional components which teams can select depending on their team needs, goals and priorities. All components take one hour to complete and can be self-run by healthcare teams in their work environment at regular intervals.

Research

Research at the Mater

The Mater Misericordiae University Hospital prioritises research that translates rapidly into patient benefits. Through our partnerships with our academic partner UCD and other academic institutions, we have a strong track record of producing high quality research that delivers real and meaningful results to patients.

Since 1852 we have worked hand in hand with our partners in UCD to deliver the very best clinical research and innovation as well as in education and training.

In fact, UCD has been ranked in the top 100 globally for pre-clinical, clinical and health sciences, in no small part due to its partnership with the Mater Hospital.

The Mater's commitment to academic medicine is encompassed in the vision and values of the organisation and specifically called out in Strategic Goal 3 which commits to enhancing our education, research and innovation capability and profile.

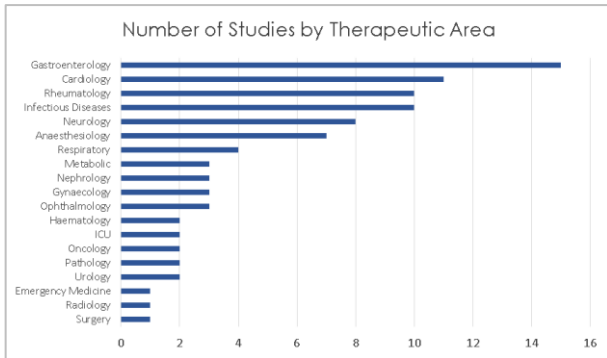
Research Ethics Committee

The Institutional Research Board (formerly the Research Ethics Committee) is designed to protect patients and staff involved in research studies and to ensure quality and value to the wider community of all research conducted at the hospital.

All clinical research conducted in the Mater Hospital needs to be submitted for review by the committee to ensure that it is in compliance with the Declaration of Helsinki, Irish law and European Union (EU) law.

UCD Clinical Research Centre

The UCD Clinical Research Centre (CRC) is an academic led, multi-site, patient-focused centre supporting high quality clinical and translational research. It operates under a single integrated governance structure within the UCD School of Medicine. The UCD Clinical Research Centre at the Mater Hospital opened in 2006 and forms part of a research network across UCD, St Vincent's University Hospital and the Mater Misericordiae University Hospital. The CRC's aims are to discover ways to improve medical care and to establish new treatments for patients who are living daily with chronic illness.



Studies by Therapeutic Area at the Mater Hospital

The Clinical Research Centre contributes to ongoing research creating a scientific and caring culture for the benefit of present and future patients. Its research contributes to the development of new cures and better treatments.

The specific research arenas in which the CRC focus include

- ▶ Collection of phenotypically well-defined repositories of biomaterials for molecular investigations
- ▶ Development of translational research programmes
- ▶ Clinical trials and investigations
- ▶ Population-based studies
- ▶ Investigations into the impact of disease on the individual and society

In addition, the sequencing of the human genome has enabled researchers to pinpoint errors in genes that cause or contribute to disease. Researchers at the CRC use this information to develop new ways to treat, cure, or even prevent the thousands of diseases that afflict all of us.

Cancer Research

The Clinical Trials and Research Unit (CRTU) is a core component of the Cancer Directorate. The CRTU was established in 2000, under Prof John McCaffrey, and supports research in oncological and haematological malignancies. The CRTU has opened over 200 trials since it opened, providing treatment options to over 1,500 patients.

Breast

Early Hormone Positive/ HER2 negative

A randomized phase 3 trial of Palbociclib with adjuvant endocrine therapy versus endocrine therapy alone for hormone receptor positive/HER2-negative breast cancer

Breast

Early Hormone positive/Her 2 Negative

The Impact of the 21 Gene Recurrence Score (RS) on Chemotherapy Prescribing in Estrogen Receptor Positive, Lymph Node positive early stage Breast Cancer in Ireland

Breast

Early Triple Negative

Neo-Adjuvant study with the PDL1-directed antibody in Triple Negative Locally Advanced Breast Cancer undergoing treatment with nabpaclitaxel and carboplatin NeoTRIPaPDL1 (Neoadjuvant therapy in TRIPLE negative breast cancer with antiPDL1)

Gastro-Intestinal

Metastatic Bowel (Colorectal) Cancer

The Impact of the 21 Gene Recurrence Score (RS) on Chemotherapy Prescribing in Estrogen Receptor Positive, Lymph Node positive early stage Breast Cancer in Ireland

Leukaemia

Untreated Leukaemia

CLL13 Trial - A phase 3 multicentre, randomized, prospective, open-label trial of standard chemoimmunotherapy (FCR/BR) versus rituximab plus venetoclax (RVE) versus obinutuzumab (GA101) plus venetoclax (GVE) versus obinutuzumab plus

Lung*Early Lung Cancer*

A randomized, phase 3 trial with anti-PD-1 monoclonal antibody pembrolizumab (MK-3475) versus placebo for patients with early stage NSCLC after resection and completion of standard adjuvant therapy (PEARLS)

Lung*Metastatic Lung Cancer*

A Phase III, Open Label, multicentre, randomised study to investigate the efficacy and safety of ATEZOLIZUMAB compared with Chemotherapy in patients with treatment-naïve advanced or recurrent (Stage III B not amenable for multimodality treatment) or metastatic (Stage IV) non-small cell lung cancer who are deemed unsuitable for platinum-containing therapy

Lymphoma*Relapsed Lymphoma*

A Phase III, randomized, double-blind, placebo-controlled study evaluating the efficacy and safety of copanlisib in combination with rituximab in patients with relapsed indolent B-cell non-Hodgkin's lymphoma (iNHL) – CHRONOS-3 (Bayer 17067)

Lymphoma*Relapsed Lymphoma*

A Phase III, 2-arm, randomized, double-blind, placebo-controlled study of intravenous PI3K inhibitor copanlisib in combination with standard immunochemotherapy in patients with relapsed indolent non-Hodgkin's lymphoma (iNHL)

Ovarian*Untreated Ovarian*

A randomised controlled trial comparing weekly chemotherapy +/- bevacizumab to standard 3-weekly chemotherapy + bevacizumab for women with recently diagnosed ovarian cancer

Prostate*Metastatic Prostate*

A prospective randomised phase III study of androgen deprivation therapy with or without local radiotherapy with or without abiraterone acetate and prednisone in patient with metastatic hormone-naïve prostate cancer

Prostate*Metastatic Prostate*

A randomized, open label, multicentre study of Cabazitaxel versus an Androgen Receptor (AR)-targeted agent (abiraterone or enzalutamide) in mCRPC patients previously treated with Docetaxel and who rapidly failed a prior AR-targeted agent (CARD)

Prostate*Metastatic Prostate*

A phase III, randomized, double-blind, placebo-controlled, multicentre trial testing ipatasertib plus abiraterone plus prednisone/prednisolone, relative to placebo plus abiraterone plus

Prostate*Metastatic Prostate*

A Multicenter, Open-label Phase 2 Study of Rucaparib in Patients with Metastatic Castration-resistant Prostate Cancer Associated with Homologous Recombination Deficiency

Prostate*Metastatic Prostate*

A Multicenter, Randomized, Open label Phase 3 Study of Rucaparib versus Physician's Choice of Therapy for Patients with Metastatic Castration resistant Prostate Cancer Associated with Homologous Recombination Deficiency

Other*Multiple Cancers, Early Stage*

A phase III, double-blind, placebo-controlled, randomised trial assessing the effects of aspirin on disease recurrence and survival after primary therapy in common non-metastatic solid tumours

Open Cancer Clinical Trials at the Mater¹²

The unit supports academic, collaborative and industry sponsored trials with 15 studies actively recruiting in breast, prostate, hepatobiliary, gastric, melanoma, endometrial, ovarian, cervical and lung cancers as well as non-Hodgkin's Lymphoma, follicular lymphoma and chronic lymphocytic lymphoma.

Prof Catherine Kelly is the Medical Director of the CTRU and is supported by an experienced team comprising a CTRU manager, nurse lead, CTRU registrar, five research nurses, five data managers, two administrative assistants and two pharmacists.

¹² Source: <https://www.mater.ie/healthcare-professionals/clinical-trials-research-unit/>

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