



RESEARCH & INNOVATION



ANNUAL REPORT 2019



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Greater Manchester has a prestigious heritage in science and innovation. It is the birthplace of many great technological firsts including the first high-powered computer, the discovery of the proton and of course, many discoveries in cancer research.

We are immensely proud of the exceptional facilities and infrastructure available to researchers in Manchester. We have adopted a 'Team Science' mentality that means innovation is nurtured at every stage from basic research, conducted in laboratories at The University of Manchester and Cancer Research UK Manchester Institute, through translational research to clinical research used to treat patients at The Christie NHS Foundation Trust, Manchester University NHS Foundation Trust, and many of the other NHS facilities across the Greater Manchester area.

There have been many reasons to celebrate Greater Manchester's research-based heritage over the past year. We have seen new ideas developed by our brightest young researchers, we have established new centres of excellence to guide the future track of research for the years to come, and most importantly of all, we have demonstrated our commitment to developing exceptional patient care, with over 650 active clinical studies at The Christie alone offering the latest in breakthrough treatments to patients who need them most.

At the forefront of our research achievements over the past year has been the continued outstanding work in the field of early detection and cancer prevention. Earlier detection of cancer offers the greatest potential for transformational improvements in patient outcomes.

In October, Manchester became a founding member of the International Alliance for Cancer Early Detection (ACED), receiving a multi-million pound infrastructure award from Cancer Research UK. Through this Alliance and in conjunction with other world leading centres, research in the early detection of cancers will be accelerated and revolutionised by harnessing the best science from the UK and USA.

Radiotherapy has also taken centre stage in 2019, over 100 patients have now been treated at the NHS's first high energy proton beam therapy centre located at The Christie and research is an integral part of this centre with the inclusion of a dedicated research gantry.

Underpinning our radiotherapy research efforts is the Cancer Research UK RadNet Manchester, a new £16.5m Radiotherapy Research Unit which will pump prime new research initiatives and infrastructure to develop new state of the art radiotherapy treatments.

We hope you enjoy reading through our list of achievements and successes throughout 2019. **Innovation is not instantaneous, but it is influenced by everyone.** We have worked hard to nurture a collaborative and supportive 'Team Science' environment for research to flourish in Greater Manchester, and it is through involving researchers, clinicians and patients, at all stages of the scientific pathway that Manchester will continue to be an innovative scientific hub within the UK, and a global influencer.



PROFESSOR ROBERT BRISTOW

Director, Manchester Cancer Research Centre (MCRC) and Research Lead for Manchester Academic Health Science Centre - MAHSC

MANCHESTER'S HISTORY OF EXCELLENCE IN CANCER RESEARCH

We were the 1st to:



“ Research is all about collaboration; it can't be done in isolation! So organisations and institutions need to work to continue to make progress.. It goes deeper than that though; **cancer is about people, patients, carers, family as well as clinicians and researchers.**

Patients are involved in all areas of research, including influencing some of the work on the rebuilding of the Paterson Institute, which will in turn, encourage more yet patient involvement when the building is completed.

The future looks exciting in my opinion!

”



MIKE THORPE
Person Affected by Cancer

1. INTRODUCTION: THE CONNECTION TO THE WIDER SYSTEM

Greater Manchester (GM) has developed an internationally recognised reputation for delivering high quality, patient focused research which has improved cancer care for millions of people worldwide.

Since 2013, we have been developing an integrated cancer system – ‘Greater Manchester Cancer’, with the ambition to bring research, education and clinical services closer together, and align our objectives.

Research is driven by the Manchester Academic Health Science Centre (MAHSC) cancer domain and the Manchester Cancer Research Centre (MCRC), which help to drive basic and discovery research from The University of Manchester (UoM) and Cancer Research UK Manchester Institute (CRUK-MI) into the clinic. It is this alignment with the ambitions of Greater Manchester Cancer that has resulted in the seamless integration of research and patient care, and allows our continued collaboration with other key organisations.

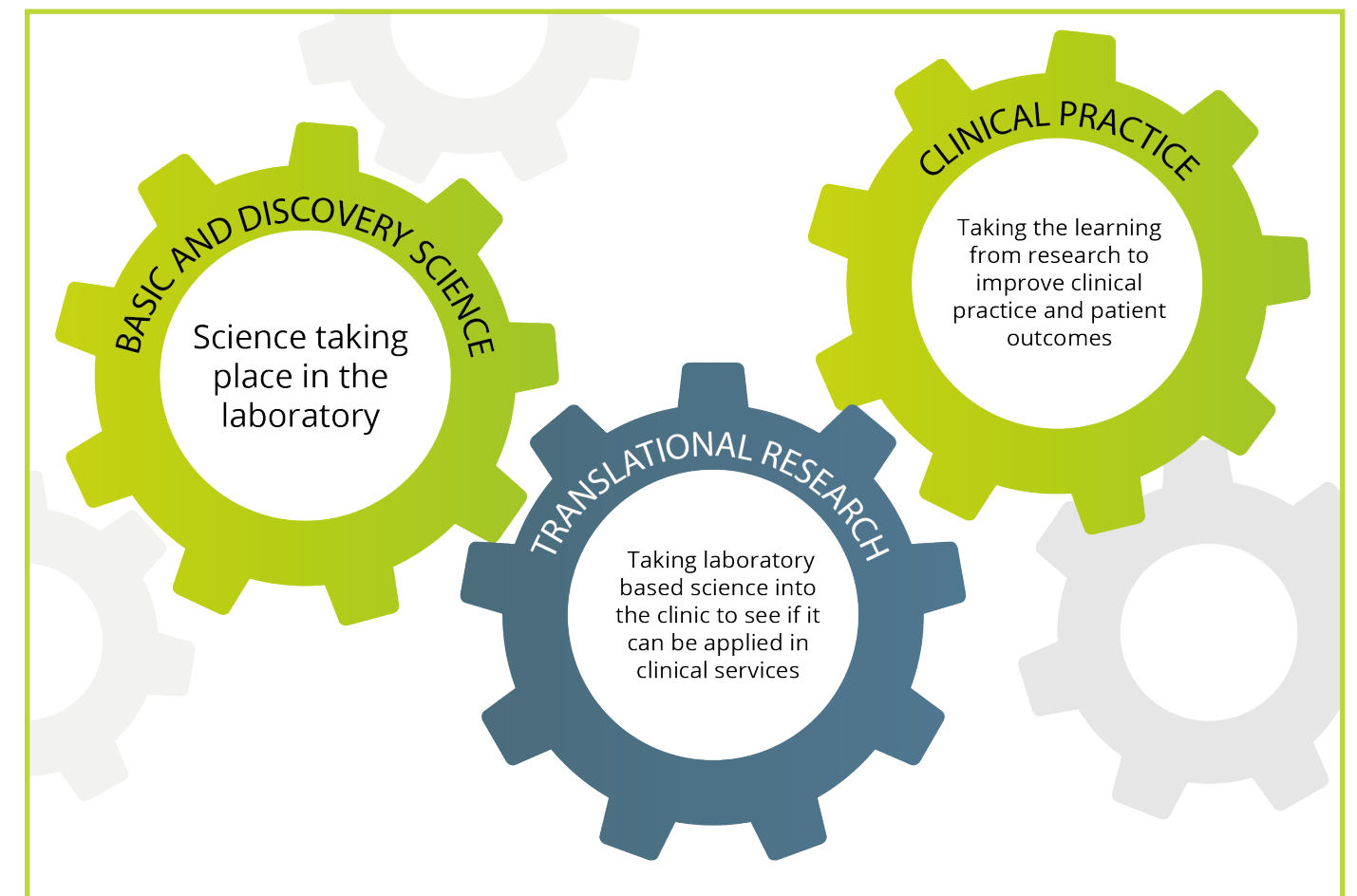
In 2019, in order to continue to improve patient outcomes and deliver the ambitious targets set out by the NHS Long Term Plan, Greater Manchester Cancer has developed, a ‘plan on a page’ to improve cancer services in the next five years (see Appendix A). We have worked with research leaders to create a joint strategy that reflects local priorities and strengths. Our main ambition is to increase the number of cancers detected at an earlier stage, whilst maintaining a focus on the whole patient pathway.

In this report we have highlighted the work of some of the institutions, facilities and collaborations that enable this integration of research and patient care.

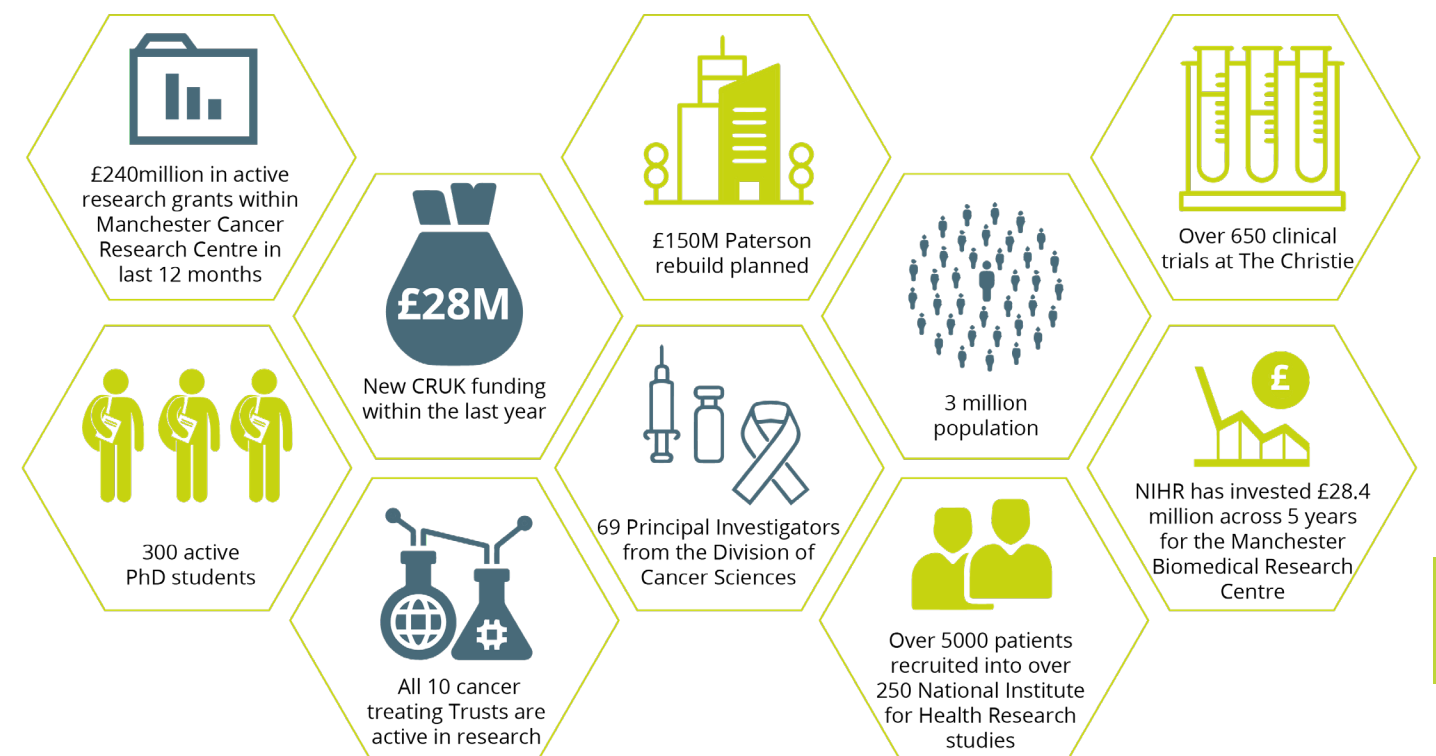
For more information on the development of cancer services in 2019, please see our complementary report: Greater Manchester Cancer Annual Report 2019.



RESEARCH AND CLINICAL SERVICES COLLABORATION



SCALE OF RESEARCH IN GREATER MANCHESTER



ROGER SPENCER

GM Cancer Board Co-Chair and
Chair of Cancer Domain
of MAHSC



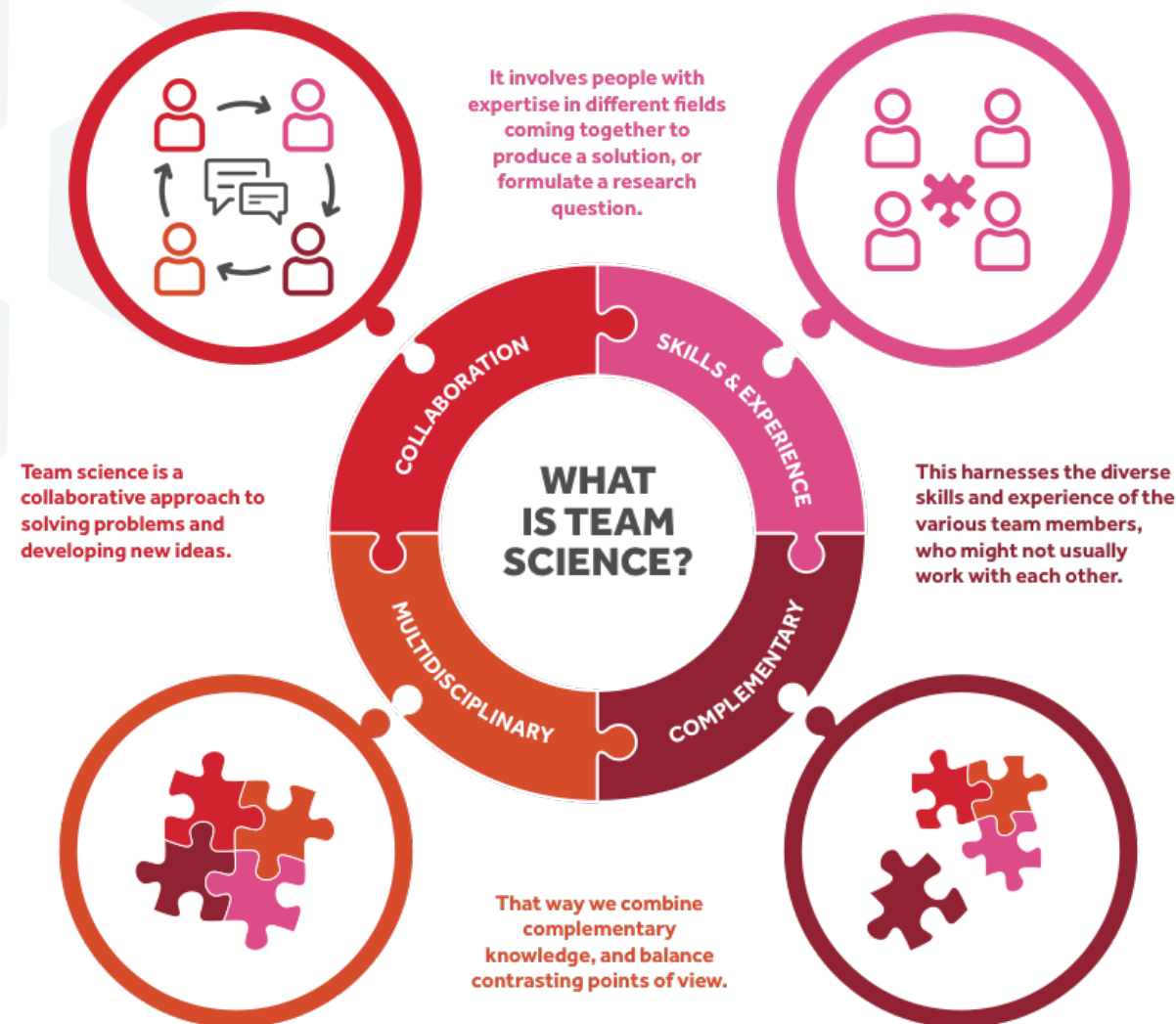
PROFESSOR DAVE SHACKLEY

Clinical Director of GM Cancer
and Clinical Lead of Cancer
Domain of MAHSC

2. TEAM SCIENCE:

WORKING COLLABORATIVELY TO ACHIEVE WORLD CLASS RESEARCH AND OUTCOMES IN GREATER MANCHESTER

As a system, we have adopted a highly successful collaborative approach to research. Team Science brings together clinicians, researchers, scientists and people affected by cancer together to deliver our vision for the future.



Such collaboration is essential to translational research, and underpins long-term multidisciplinary projects.

By adopting the 'Team Science' approach, we continue to develop new relationships, strengthen current partnerships, develop our infrastructure and create joint ambitions for the future with all stakeholders across the system.

We have an ever-growing, outstanding cohort of clinical and scientific researchers which facilitate our collaborative clinical network, meaning that our GM population of three million residents is best-placed to access a coherent, integrated cancer research programme, which in turn continues to benefit those across the UK and the rest of the world.

The abundance and proximity of world-class research organisations and institutions across GM further support the facilitation of excellence in research, both in terms of basic science and subsequently to then work closely with our clinical teams to deliver world class cancer care for our patients.

In this section, we have highlighted some of those key collaborations.

MANCHESTER CANCER RESEARCH CENTRE (MCRC)

The Manchester Cancer Research Centre (MCRC) was established in 2006 by The University of Manchester, Cancer Research UK and The Christie NHS Foundation Trust to share resources and maximise the academic output and productivity in cancer research. This partnership has since been expanded to include research activity at Manchester University NHS Foundation Trust and Salford Royal NHS Foundation Trust.

The MCRC has an ambitious vision to be a top five world-leading comprehensive cancer centre by 2025 – transforming the clinical care of cancer patients by developing and implementing a personalised medicine strategy and providing access to advanced novel treatments.

The MCRC works across the various cancer institutions and organisations within GM to facilitate collaboration between academic groups, nurturing innovation and discovery in various cancer disease sites across multiple research themes. It is this approach to cancer 'Team Science' that helps to drive basic and discovery science into the clinic.



TOWN HALL EVENTS

Demonstrating the 'Team Science' ethos, over the past 3 years, the MCRC has hosted a series of Town Hall events focused on specific disease sites. The aim of these events is bring together scientists, patients, clinicians, operations and other teams to identify and develop a new high risk/high gain multi-disciplinary strategic research project that can only be accomplished in Manchester.

Town Hall events have already been held for breast, lung, prostate, haematological, ovarian and melanoma cancers, and in July, the MCRC held the latest focused on hepato-pancreato-biliary (HPB) cancer. These projects then go out for external international peer review prior to the project commencing.



CASE STUDY: LAUNCH OF EUROPEAN NETWORK FOR YOUNG CANCER RESEARCHERS

“ In November 2019, the European Network for Young Cancer Researchers was launched at MCRC, which aims to build a European network of young researchers working in the cancer field as a platform to forge strong collaborations between research centres and promote scientific discussions. ”



NIHR | Clinical Research Network Greater Manchester

Greater Manchester (GM) Clinical Research Network (CRN) is one of 15 NIHR Local Clinical Research Networks in England, supporting research taking place in the NHS, Public Health and Social Care settings. The GM CRN works in partnership with the 14 local NHS Trusts and 11 Clinical Commissioning Groups in GM, providing infrastructure and support both within Trusts and through a central team to:



- **Work with patients to ensure their needs are met**
- **Help researchers to set up clinical studies quickly and effectively**
- **Match patients with potential studies and deliver those studies to time and target**
- **Gather intelligence about patient populations and care pathways**
- **Support the life sciences industry to deliver clinical research programmes**
- **Provide health professionals with clinical research training**



The GM CRN collates data on studies that have been adopted onto their portfolio. GM is currently the top recruiting locality across England into cancer portfolio studies based on population. All 10 cancer treating Trusts across GM are research active, with **5,164** patients being recruited into **248** portfolio studies this year.

THE UNIVERSITY OF MANCHESTER (UoM)

The University of Manchester's cancer research portfolio ranges from seeking to understand the molecular and cellular basis of cancer to the development and testing of novel drugs and other therapeutic approaches. Through nursing, psychology and policy work, research in to the physical, emotional and economic impacts of cancer is being conducted and put into practice across the University.

The Division of Cancer Sciences provides a focus for cancer research activity within the Faculty of Biology Medicine and Health. It combines an internationally leading academic reputation with the largest clinical cancer service in the UK. Research at UoM led by world-renowned scientists who understand the value of academic and scientific collaboration across disciplines, cultures and countries in transforming people's lives across the world.

UoM is contributing to improving the evidence base for the treatment and detection of cancer, both in the UK and globally, including in India where its researchers have increased survival rates of children with leukaemia by 15% in just four years.



The University of Manchester



Work at the Cancer Research UK Manchester Institute is led by Professor Richard Marais and spans the whole spectrum of cancer research, from programmes investigating the molecular basis of cancer, especially those focused on developing new treatments. World-class facilities in the institute, including the imaging and molecular biology labs, support these programmes, paving the way for new discoveries.



CRUK's Drug Discovery Unit works with industry partners to help drive the translation of research breakthroughs in the lab into new treatments for patients as quickly and cost-effectively as possible.

In partnership with University College London, Manchester hosts our Lung Cancer Centre of Excellence. By working together with internationally renowned scientists and clinicians, CRUK-MI have a real and exciting opportunity to make significant advances in the prevention, diagnosis, treatment and care of lung cancer.

Research in GM benefits from the strong partnership between Cancer Research UK, the University of Manchester and The Christie NHS Foundation Trust. This collaboration allows us to develop kinder, targeted and more effective treatments to help people with cancer survive their disease.



CASE STUDY: PATERSON REDEVELOPMENT

“ In April 2017, the former Paterson research building, located on the site of The Christie NHS Foundation Trust, suffered a devastating fire. Over 300 scientists and support staff were displaced and relocated to Alderley Park, Cheshire, to allow them the best opportunity to continue their world-leading cancer research.

Plans are now underway to replace the severely damaged site with a new £150m comprehensive cancer research building, complete with state-of-the-art research facilities, to create one of the top five cancer research centres in the world – right in the heart of Manchester.

Within this new facility, cross-disciplinary research will be embedded in the patient experience and lead to more clinical trials than ever before. Realising this unprecedented opportunity will transform the 'disaster' of the fire into a bold and exciting future.

The new facility will bring world-leading researchers and clinicians together to change the future of cancer.”

EXPERIMENTAL CANCER MEDICINE CENTRES (ECMC)



Dr Natalie Cook and Professor Caroline Dive co-lead the Manchester Experimental Cancer Medicine Centre, a unique partnership between CRUK and the National Institute for Health Research (NIHR) to bring together scientists and clinicians to accelerate the flow of ideas and new treatments from the laboratory to the clinic.

Manchester ECMC collaborates with other ECMCs in the North of England to increase opportunities for patients to participate in early phase clinical trials including trials with targeted therapies.

Manchester ECMC is strategic lead for the ECMC Precision Medicine working group which looks at ways of offering standardised molecular profiling and developing initiatives for access to clinical trials and targeted agents matched to genomic findings.

In July 2019, in conjunction with the Manchester Cancer Research Centre (MCRC), Manchester ECMC hosted an international conference entitled *Phase 1: where science becomes medicine*.

The conference attracted over 200 local, national and international delegates to hear presentations from a number of internationally renowned speakers with expertise in the field of early phase cancer research. The conference was an important networking opportunity for researchers in Manchester to develop relationships with other leading centres and discuss the opportunities for further collaboration.



Award in Experimental Cancer Medicine

Manchester’s Experimental Cancer Medicine Team (ECMT) was awarded the award for ‘Research Team of the Year 2019’ at the GM Clinical Research Awards. The team continues to deliver a diverse portfolio of early phase clinical trials, including a number of first time in human trials.



HEALTH INNOVATION MANCHESTER (HInM)

Health Innovation Manchester is an academic health science and innovation system at the forefront of transforming the health and wellbeing of Greater Manchester’s 2.8 million citizens.



Health Innovation Manchester was formed in October 2017 by bringing the former Greater Manchester Academic Health Science Network (GM AHSN) and Manchester Academic Health Science Centre (MAHSC) under one umbrella. Through an innovation pipeline they support the discovery, development and dissemination of new solutions into front line services.

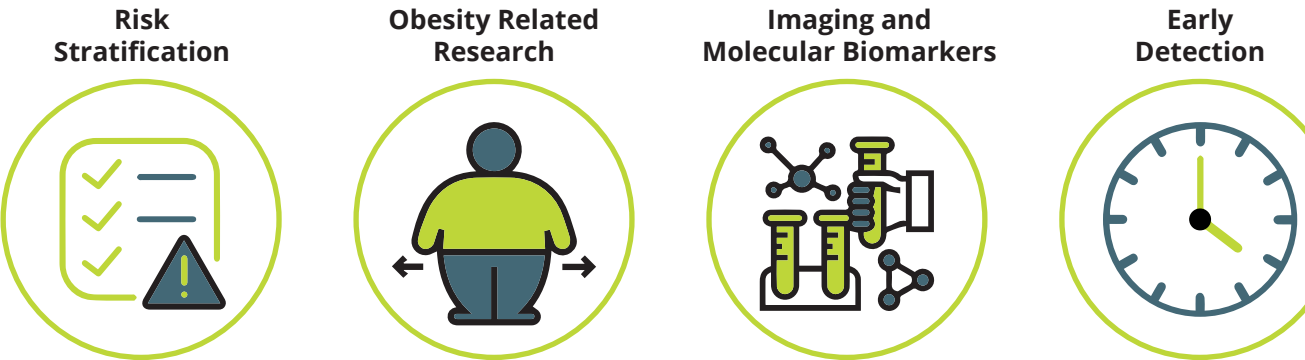
The MAHSC research domains are focused on addressing the greatest population health challenges, with research projects undertaken via MAHSC and GM’s other research bodies pulled through Health innovation Manchester’s innovation pathway. This provides a rich pipeline of evidence-based innovations that can be deployed at pace and scale, making fast-tracked improvements to the health of local people and beyond.

Through the cancer research domain, HInM are supporting transformational change in cancer-related life sciences in order to provide outstanding healthcare to the population of Greater Manchester. This includes; supporting the development of exceptional facilities to enable research transformation; research into prevention and early detection of cancer; identifying new targets and developing new treatments; and delivering personalised cancer care.

Manchester holds a unique position within cancer research, with world-leading basic science research co-located with the largest single site cancer centre in Europe – Cancer Research UK Manchester Institute and Division of Cancer Sciences researchers (part of The University of Manchester) are both based on The Christie NHS Foundation Trust site. This co-location provides an ideal opportunity to support research that goes from bench to bedside, supporting the integration of clinical and basic scientists so that laboratory-based research is rapidly translated into the clinic.

NATIONAL INSTITUTE FOR HEALTH RESEARCH
MANCHESTER BIOMEDICAL RESEARCH CENTRE (NIHR-BRC)

The NIHR Manchester Biomedical Research Centre (BRC) connects world-leading researchers based at the University of Manchester and three NHS Trusts in Greater Manchester, with a joint vision to drive forward the transformation of scientific breakthroughs into life-saving treatments and care for patients. Established in 2017, the NIHR has invested £28.4 million across five years to drive forward fundamental research in several key areas. Cancer Prevention and Early Detection is one of three cancer themes in the BRC, and comprises of four programmes of work:



Manchester BRC aims to create a peerless and integrated health research, translation and innovation infrastructure to improve health and attract inward investment. The team are passionate about patient and public involvement and through a range of activities they work with people and patients to inform, discuss, listen and make decisions about their research.

The BRC sits at the heart of the ‘One Manchester’ innovation ecosystem, embedded within Health Innovation Manchester (HInM - Ian Bruce Academic Director, Jan 2019) and Manchester Academic Health Science Centre. Prof Graham Lord, Dean of the Faculty of Biology Medicine and Health (Feb 2019).

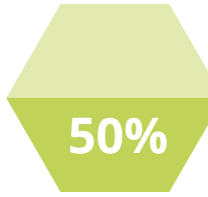
THE BRC’S MISSION:
“Driving health improvements and lasting change for all through creative, inclusive and pro-active research that identifies and bridges gaps between new discoveries and individualised care.”

3. PREVENTION AND EARLY DETECTION

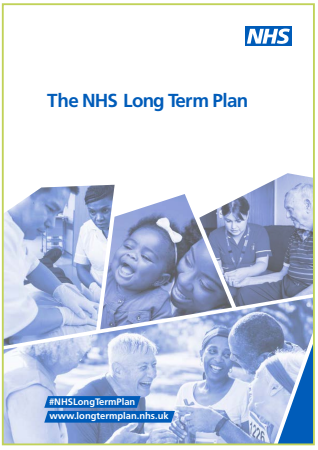
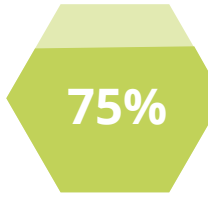
Cancer prevention and early detection are two key priorities for researchers and clinicians in Greater Manchester. We want to support as many people as possible to reduce their risk of a cancer diagnosis, or support those diagnosed to have the best outcomes. Early detection of cancer offers patients the greatest potential for curative treatment, fewer treatment-related morbidities and a better quality of life.

This reflects the target set out by the NHS Long Term Plan published in 2018, to increase the number of people diagnosed with cancer at an early stage (stage 1 or 2) from 50% to 75% by 2028.

Current Early Detection Rate



Ambition Rate



Across the GM system, we have been working on a number of programmes, from public health and clinical practice, to research, to address these priorities. Examples of progress from in research are highlighted in the following pages.

DETECTING CANCER EARLY RESEARCH PRIORITIES SURVEY

The Detecting Cancer Early Priority Setting Partnership (PSP) was established this year to identify the top ten research priorities for detecting cancer early that are most relevant to patients, healthcare professionals and members of the public.

The study was led by the National Institute for Health Research (NIHR) Manchester Biomedical Research Centre (NIHR-BRC) in collaboration with the James Lind Alliance.

The priorities span a range of research types: from new diagnostic tests, risk stratification for screening, considering public attitude and understanding of health, to how our health services are structured to work effectively across organisational boundaries and support patients in an integrated pathway.

The views of People Affected by Cancer along with those working in the health care system continue to support the development of future research programmes of work.

The study heard from

500 PEOPLE

Including...

Patients & Members of the Public

Healthcare Professionals

Friends, Family & Carers

Researcher & Academics

There is now a list of over...

1300 QUESTIONS

Covering research into: cancer testing, awareness & investigation of symptoms, how the NHS works, and promoting healthier lifestyles across the population

- 1

The top priority was for the use of non-invasive tests to be developed. This is currently being investigated in cervical/womb cancer where preliminary research shows high patient satisfaction.
- 2

The second priority was a blood test to determine early signs of cancer; an active goal for many research teams.
- 3

The third priority was to look at how to take diagnostic tools into primary care. This priority is harder to address as it involves restructuring NHS systems. However, the recent success of the lung health check in taking screening services away from the hospital and into the community shows it as an approach worth pursuing.
- 4

The fourth priority was to understand what characteristics prevent a person from reporting early symptoms of cancer. People felt that new tests and diagnostics are not useful if we still do not understand why people fail to report early symptoms.
- 5

The fifth priority was how to use genetic testing to identify high risk individuals. In GM we have significant research taking place across a number of these areas, including breast cancer.

PARTICIPANT FEEDBACK:

“ I had wondered what it would be like to take part in a steering group or final workshop made up of health care professionals alongside members of the public, would I feel more intimidated about expressing my view? Would my view be considered to have equal value?

Although the first few minutes of my first meeting did feel a little more daunting, I soon discovered my concerns were unfounded. It was really helpful to be able to discuss our different perspectives. I felt that the views of public contributors were valued and reflected upon and the project benefited from the insights that the health care professionals brought to the table. Far from being intimidated I found that I learnt a lot from them and that at times both parties changed their views because of the insight shared by others.

”

Several of these research priorities are being explored through the collaborative work across the National Institute for Health Research's Manchester Biomedical Research Centre cancer theme, the University of Manchester and more recently with the CRUK Alliance for Cancer Early Detection (ACED). We have highlighted some of this work below:

LUNG HEALTH CHECKS

Lung cancer is the biggest contributor to premature deaths in Greater Manchester, causing more deaths than all other cancers combined. Despite advances in therapies for lung cancer, around 80% of patients are diagnosed at a late stage in their disease which limits treatment options. This project, which began in 2016 involved researchers from the University of Manchester (UoM) and the lung cancer team at Manchester University Foundation Trust Hospital (MFT), is dedicated to bringing health checks directly to those communities that are most at risk of developing lung cancer.



Using a simple questionnaire a risk analysis performed, and those patients deemed with a sufficiently high likelihood of having cancer were sent for a scan there and then, which only took a few seconds.

Dr Phil Crosbie, a researcher at the UoM and lung physician at MFT Hospital where he specialises in lung cancer, led the project. For him, one major success of the programme was the detection of early-stage disease “Sadly, most patients whom I see already have advanced cancer,” he explains, “but in this programme 80% were at an early stage, a reversal compared to the 75% who are at a late stage that we’d normally encounter for the first time in the hospital.”

The team are now collaborating with Cancer Research UK to see whether implementing cutting-edge biomarkers, as part of lung cancer screening programmes, can lead to better and faster diagnoses.

The lung health check programme in 2019 is now live in 2 localities in Greater Manchester (Salford and North Manchester) and in early 2020 will also involve patients from Tameside & Glossop.



National Cancer Care Team of the Year:

In April 2019, The Manchester Lung Cancer Screening Team, led by Dr Phil Crosbie from the University of Manchester, won the award for ‘National Cancer Care Team of the Year’ at the #BMJAwards2019.

BREAST RISK STRATIFICATION AND SCREENING

The last year has seen further progress in accurately stratifying the risk of breast cancer in the general population, which will help clinicians implement early detection and prevention strategies for those most at risk.

National Institute for Health and Care Excellence (NICE) guidelines indicate that women at moderate or high risk of breast cancer can be considered for, or offered chemotherapy prevention (Anastrozole or Tamoxifen) that may up to halve their risk of developing breast cancer. Women at high risk are eligible for annual breast screening from 40-59 years of age and moderate risk from 40-49 years of age (standard three yearly mammography screening starts at 50).

Using the simple NICE algorithm for family history, only 3% of women fit into either high or moderate risk groups. However, work led by Professor Gareth Evans, Cancer Prevention and Early Detection Theme lead and Dr Sacha Howell, Developing New Imaging and Molecular Biomarkers Programme Co-Lead at NIHR Manchester BRC has shown in the last year that using a combination of information from the density of breast tissue on a woman's mammogram and common genetic changes, we can now identify around 20% of women that fit into these two categories, who develop 40-45% of all breast cancers.

The team can also now identify around 1 in 6 women (18%) at low risk of breast cancer (<1.5% 10-year risk) who develop around 8% of breast cancers. This information was obtained from 58,000 Greater Manchester women who entered the PROCAS study between 2009-2014. 8,000 women are now being recruited into PROCAS2 who are receiving their risk estimates within 6 weeks of their screening mammogram.

The team have also shown that weight gain is a far better predictor of breast cancer risk than a woman's BMI (Body Mass Index). A study has been published showing that annual mammography screening is effective in young women aged 35-39 years and this has been evaluated by NICE as a surveillance report. There are now plans to assess young women aged 30-45 years of age for their breast cancer risk so those at moderate or high risk can benefit from early mammograms, which involves evaluating the ability of a low dose mammogram to assess breast density.



BREAST SCREENING AFTER RADIOTHERAPY DATASET (BARD)

Manchester researchers and clinicians, in collaboration with Public Health England have set up a nationwide service for 6,500 women at high risk of breast cancer following radiotherapy to breast tissue under age 36 (usually treatment for Hodgkin lymphoma). BARD will make sure all at-risk women receive invitations for screening at the right time, provide relevant information and undertake research. BARD has featured in several media articles during the year and will be the subject of a plenary address at the PHE Cancer Data Conference in Nottingham, July 2020.

EXCELLENCE IN NEUROFIBROMATOSIS SUPPORTING EARLY DETECTION

“ Neurofibromatosis type 2 (NF2) is a genetic condition that causes tumours to grow in the nervous system. The tumours are usually benign but can cause a range of significant symptoms affecting the nervous system or spinal cord.

In July 2019, Professor D. Gareth Evans was recognised by Expertscape as the top-rated expert in both neurofibromatosis type 2 and the related topic of acoustic neuroma in the world. This tremendous achievement also makes Manchester the second-best city in the world to perform neurofibromatosis type 2 research.



EARLY DETECTION: LYNCH SYNDROME

Almost 3% of womb cancers are linked to an inherited cancer predisposition condition, Lynch Syndrome, which affects 1 in 300 people globally.

A similar proportion of bowel cancers are caused by Lynch Syndrome, which led to NICE guidance detailing that anyone diagnosed with bowel cancer should be tested for the condition. While this link is well established, the link with womb cancers is less well studied.

In partnership with Professor Gareth Evans, Professor Emma Crosbie, lead for early detection within the Manchester's BRC led the first prospective UK study to determine the prevalence of Lynch Syndrome in 500 women newly diagnosed with womb cancer.



Recommendations have now been sent to NICE for extending current guidance on Lynch Syndrome testing. In addition, because womb cancer usually develops first, it is likely to be the first indication of a patient having Lynch Syndrome and therefore being at risk of developing bowel cancer.

Professor Crosbie says: “The link between Lynch Syndrome and womb cancer presents a real opportunity to improve outcomes for patients – but it's an opportunity that is being missed because we just don't test for it consistently. I'm trying to detect gynaecological cancers at their earliest treatable stage, when it's more likely that treatment will be curative.”

PERSON AFFECTED BY CANCER

“ My name is Jamal, I am 42, and I have Lynch Syndrome.

I was diagnosed with 8 years ago with large tumour in my intestine at stage 2. Luckily it hadn't spread, so it was removed in surgery and I didn't need chemotherapy.

Two years prior to my own diagnosis; my mother had to have a hysterectomy, as a result of cancer in her womb. The rest of the family thought it was just one of those things, so no-one had any further testing. In retrospect, if we had been tested my cancer could have been spotted earlier.

I am very proud I am still here, and that I can provide assistance to people that can potentially suffer from Lynch Syndrome.



”

URINE TEST COULD PREVENT CERVICAL CANCER

The NHS cervical screening programme tests for so called ‘high-risk’ types of human papillomavirus (HPV) and looks at the health of the cells of the cervix in women who test high-risk HPV positive. Around 1 in 20 women show abnormal changes which might go on to become cancer and are referred for colposcopy, where the cervix is examined under magnification, allowing abnormal areas to be seen, sampled and treated, before they ever cause cancer.

Cervical cancer is most common in women aged 30 to 35 years. But the precancerous stage is detectable in the 5-10 years before this, when up to a third of women fail to attend for their smear test.

A study, led by Professor Emma Crosbie and published in BMJ Open, found that urine testing was just as good as the cervical smear at picking up high-risk HPV, the virus that causes cervical cancer. The research team say a urine test could help increase the numbers of women who are screened for cervical cancer. Urine testing could also have a role in the developing world, where cervical cancer is up to 15 times more common and smear testing largely non-existent.

Professor Crosbie said: “Many younger women avoid the NHS cervical cancer screening programme because they find it embarrassing or uncomfortable, particularly if they have gynaecological conditions like endometriosis.



We’re really very excited by this study, which we think has the potential to significantly increase participation rates for cervical cancer screening in a key demographic group.

“These results provide exciting proof of principle that urine HPV testing can pick up cervical pre-cancer cells, but we need to trial it on a greater number of women before it can be used in the NHS. We hope that is going to happen soon.

“Urine is very simple to collect and most hospitals in the developed and developing world have access to the lab equipment to process and test the samples. Let us hope this is a new chapter in our fight against cervical cancer, a devastating and pernicious disease.”

CANCER RESEARCH EXCELLENT IN CLINICAL TRIALS

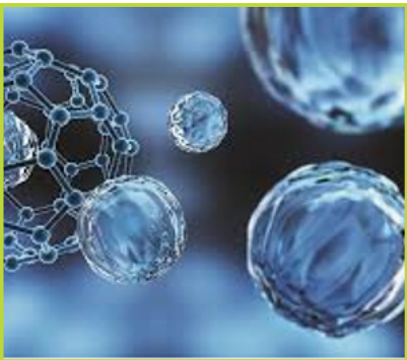


Emma Crosbie, Professor of Gynaecological Oncology at The University of Manchester and Cancer Early Detection Programme Lead for the NIHR Manchester Biomedical Research Centre (BRC), has been recognised at the National Cancer Research Institute Conference with a prestigious cancer award.

The Cancer Research Excellence in Surgical Trials (CREST) award was established to recognise surgical teams who have made the greatest contribution in recruitment across the National Institute for Health Research (NIHR) cancer trials portfolio. This award recognises the work of the Endometrial Cancer Research Group, led by Professor Crosbie, which has seen strong recruitment onto clinical trials, provided evidence of multidisciplinary working, covered a breadth of studies and nurtured the next-generation of surgical oncology researchers.

NANOPARTICLES TO DETECT CANCER SOONER

Professor Kostas Kostarelos and his team at the University of Manchester are testing the use of nanoparticles; microscopic ‘sticky’ molecules, which collect components of blood on their surface. The analysis of the nanoparticles could lead to the identification of small concentrations of specific molecules, or ‘biomarkers’ in the blood that indicate someone has the earliest stage of the disease. Detecting a cancer at the earliest stage with a simple, non-invasive blood test would allow the treatment to have the best chance of success.



If successful, this approach could transform the field of early detection, and if the right biomarkers are found, these nanoparticles could potentially be used to monitor how a treatment is working or to detect recurrence of the disease at the earliest possible point, leading to better patient survival.

THE INTERNATIONAL ALLIANCE FOR CANCER EARLY DETECTION (ACED)

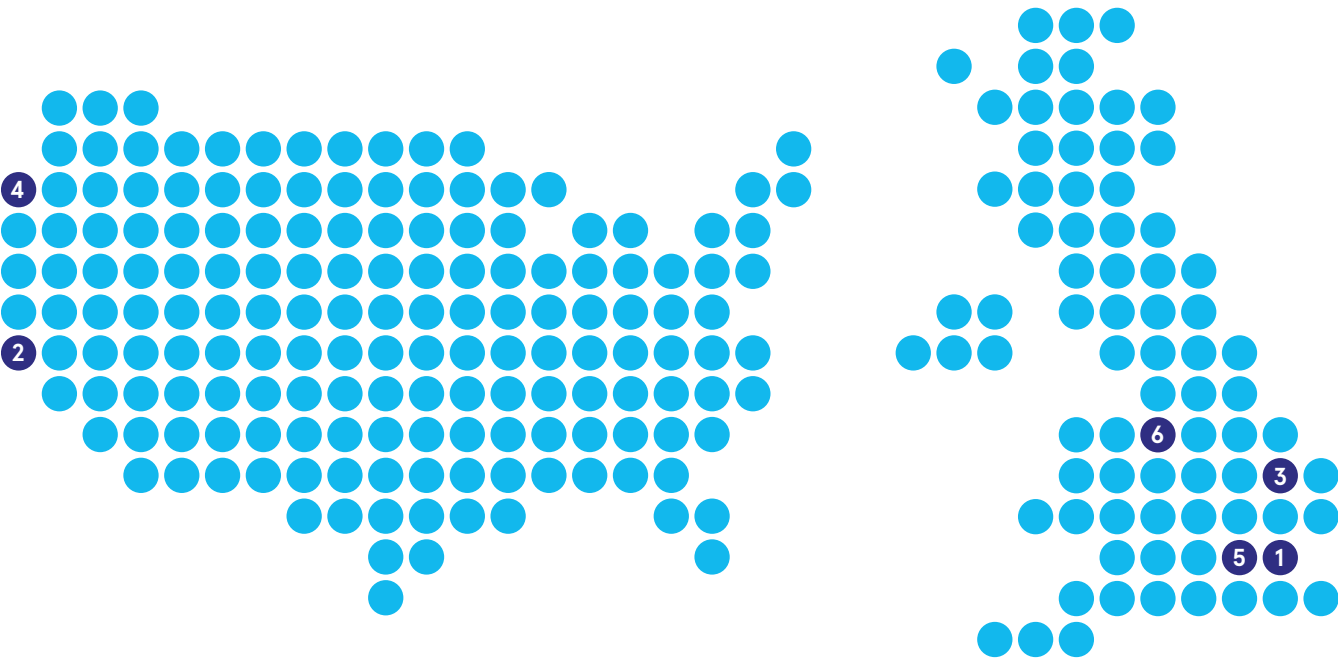
In 2019, Manchester successfully applied to become a founding member of the International Alliance for Cancer Early Detection (ACED), a unique partnership between Cancer Research UK and five leading early detection research centres: Canary Centre at Stanford University, the University of Cambridge, Oregon Health & Science University (OHSU) Knight Cancer Institute, University College London, and The University of Manchester (UoM).



Greater Manchester (GM) researchers are set to receive over £3.2m in funding with the aim to increase the pace and scale of research. New initiatives include bringing novel screening programmes to the population to identify the signs of breast and lung cancer sooner, and investigating the fundamental biology that underpins how cancer develops.



Members of the Alliance will work collaboratively, sharing resources and knowledge to tackle the complex issue of early detection. In addition, the Alliance will help to train the next-generation of early detection scientists, exposing them to world-leading research within an internationally recognised hub.



- | | | |
|-----------------------------|--------------------------------|--------------------------------|
| 1 Cancer Research UK | 3 University of Cambridge | 5 UCL |
| 2 Canary Centre at Stanford | 4 OHSU Knight Cancer Institute | 6 The University of Manchester |

4. BETTER TREATMENT

We continue to revolutionise the treatment of cancer in Greater Manchester, however, we recognise that there is still more to be done. We want to support people to live longer with cancer and give them the best experience possible, in line with available treatments and individual wishes.

For some patients, this may mean delivering personalised treatments, tailored to respond to their individual genetic make-up, rather than a one-size-fits-all approach. For others, priorities could include receiving treatment closer to home, to allow them to get on with their daily lives and reduce the burden of on-going treatment.

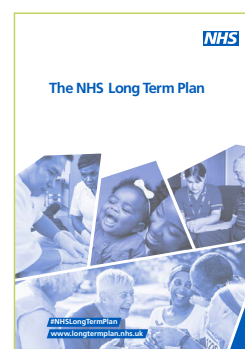
Reducing the over-treatment of cancer and developing kinder treatments continues to be explored across the system. The following pages highlight key areas of progress across GM in providing better treatment to our patients.

ONE SIZE DOESN'T FIT ALL



“The NHS Long Term Plan highlights that a ‘One-size-fits-all approach [...] cannot meet the increasing complexity of people’s needs and expectations.

‘Evidence shows that people will have better experiences and improved health and wellbeing if they can actively shape their care and support.’”



INNOVATION OF ADVANCED THERAPIES IN MANCHESTER: iMATCH CONSORTIUM

Advanced Therapy Medicinal Products (ATMPs) are cell and gene therapy products that offer unprecedented promise for diseases where there is a high unmet need.

Following extensive research, one example of an ATMP recently made available on the NHS, is a type CAR-T therapy (Chimeric Antigen Receptor T-cell) that is available to treat some leukaemia and lymphoma patients.

With Advanced Therapies growing in promise and demand, there is great interest in developing centres of excellence for delivering these complex treatments, either as a standard of care or within the context of clinical trials. Progress continues to be made in Greater Manchester in enabling research and access to this important area.

In 2018, £7M funding from Innovate UK was awarded to iMATCH to coordinate the scale-up of Advanced Therapies as one of 3 National Centres which have formed the Advanced Therapy Treatment Centre (ATTC) network.

The iMatch consortium is a 12 partner, Manchester-based consortium, comprising of two clinical sites (The Christie – iMatch Lead and Manchester University NHS Foundation Trust), The University of Manchester and nine commercial, life science partners.

The goal of iMATCH is to transform the conduct of clinical studies in Advanced Therapies to make them as routine to deliver as other clinical studies across the NHS.

The key objectives of iMATCH include:

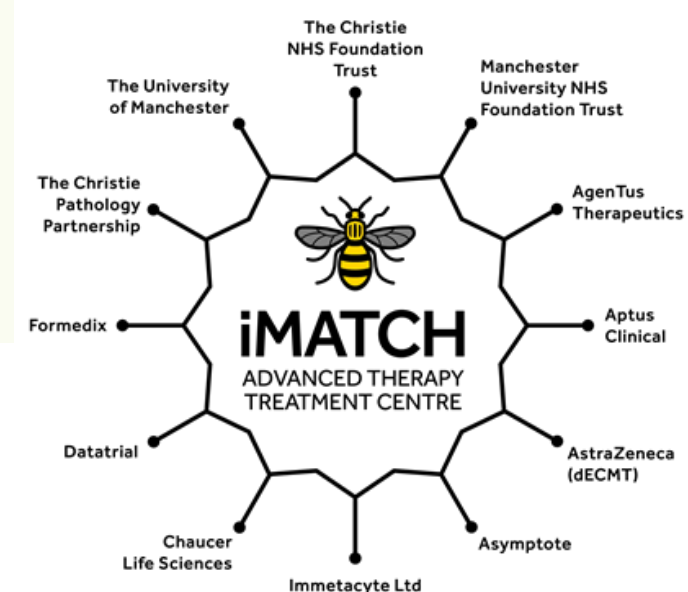
- Maximising access of Advanced Therapies to patients through integration of sample collection within existing infrastructure and optimising extraction of cellular components
- Developing electronic sample traceability and tracking systems through novel digital solutions
- Developing innovative systems of clinical data capture designed to address the complexity of advanced therapies
- Scale-up in the clinical setting to meet delivery needs within the NHS
- Training/knowledge sharing to ensure the safe delivery of Advanced Therapies through education, communication and systems developed to enable more widespread adoption across the NHS

The first 18 months of the project has already demonstrated a significant increase in the number of patients being treated across GM with advanced therapies, with more clinical trials also available.



There have been further collaborations across the network and additional funding has been awarded by the Manchester Cancer Research Centre (MCRC) for translational research in this area. In addition, iMATCH has supported the development of a unique Advanced Therapies Masters Programme (MSc) at The University of Manchester, which received its first intake of students in September 2019.

iMATCH CONSORTIUM MEMBERS



PERSONALISED TREATMENTS

PERSONALISED MEDICINE IN MELANOMA: CACTUS PROGRAMME

As part of our personalised medicine programme in melanoma led by Professor Paul Lorigan, Professor Richard Marais, Professor Caroline Dive and Dr Rebecca Lee, 2019 saw the opening of the CACTUS trial (Circulating Tumour DNA guided Switch) for patients with a specific melanoma mutation (BRAF).

Circulating tumour DNA (ctDNA) is DNA that comes from the cancer, which can be detected in the blood. Work in Professor Richard Marais' laboratory at the CRUK Manchester Institute had previously shown that it can be used to accurately monitor the melanoma's response to treatment.

Previous research has shown that when patients are responding to targeted therapy, they may actually respond better to immune therapy (such as checkpoint inhibitors, which boost the immune system against cancer), commonly used in melanoma. This trial is examining whether ctDNA can guide us to switch patients to immune therapy, if they are responding to targeted therapy, which we hope will improve their outcomes.

This research has also enabled identification of a relapse following surgery for melanoma at a very early stage, when the cancer is not visible on scans. Based on this data, a large clinical trial has been designed, named "DETECTION" (Circulating tumour DNA guided Therapy for stage IIB/C melanoma after surgical resection), which has been recently funded by Cancer Research UK.

This trial uses ctDNA to select patients who are at high risk of melanoma relapse to therapy, whilst sparing those who have been cured by surgery alone potentially toxic treatments, thus tailoring treatment to the individual.



“ EXCELLENCE IN THE TREATMENT OF MELANOMA

In 2018, Professor Marais was presented with the Society for Melanoma Research's Outstanding Research Award for highly impactful, major discoveries in the field of melanoma over the past five years.

One of Professor Marais' greatest breakthroughs has been showing that a faulty BRAF gene is responsible for the development of around half of all malignant melanomas. This has led to the development of the drug vemurafenib, a targeted therapy that blocks the cancer-causing activity of this gene and the first precision medicine available for patients with this type of melanoma.



”

PERSONALISED MEDICINE: TARGET (TUMOUR CHARACTERISATION TO GUIDE EXPERIMENTAL TARGETED THERAPY)

The Manchester Cancer Research Centre TARGET programme (Chief Investigator, Dr Matthew Krebs) is a flagship study within the Manchester Biomedical Research Centre, Cancer Precision Medicine theme. The study is run at the Manchester Clinical Research Facility at The Christie NHS Foundation Trust and samples are processed at the CRUK Manchester Institute with Prof Caroline Dive and at Manchester Centre for Genomic Medicine Genomic Laboratory hub.

TARGET is a precision medicine study aiming to match patients to targeted therapy in early phase clinical trials, based on the genetic make-up of their cancer. Results are discussed at a monthly Molecular Tumour Board (MTB) meeting. The study utilises circulating tumour DNA (ctDNA), acquired from a simple blood test (as well as archival tumour) for genetic testing.

The results of the first part of the study were published in Nature Medicine in 2019. Of the first 100 patients recruited, 41 had a genetic mutation in their tumour that could be actioned and 11 patients were matched onto a clinical trial. All these patients benefited from taking part in the matched trials with 4 patients showing tumour shrinkage of more than 30% who would otherwise have had no further treatment options. Recruitment is ongoing with a planned total of 450 patients by summer 2020.

Plans are underway to roll out TARGET across the network of Experimental Cancer Medicine Centres with the ambition to improve patient outcomes through matched selection of trials on a national scale.

During 2019, a new immune biomarker toolkit has been implemented on the TARGET trial in collaboration with the Tumour Immunology and Inflammation Monitoring Laboratory (TIIML, Kilgour/Dive). These tests will provide additional information on the patient's cancer and may help inform which patients could benefit from immunotherapy-based treatment.

Professor Caroline Dive, the laboratory lead author of the study from the CRUK Manchester Institute, said: "Now that we have demonstrated the feasibility of matching clinical trials for patients who have not responded to previous treatments by analysing the tumour DNA in their blood, we are working to improve the scope of our blood testing approach. We are making the test more sensitive and adding new elements to it in order to comprehensively understand more about the molecular landscape of a patient's disease. We are also taking several blood samples over time to see if a tumour aberrations are disappearing with treatment, or if there is emergence of a molecular change that could lead to treatment resistance. This would allow us to stop a failing treatment and consider new options to stay a step ahead of the disease."

The authors caution that while this study is promising, not every patient will have identifiable and 'druggable' faulty genes in their blood, nor will every patient have the opportunity to receive a treatment tailored to their cancer.

SUCCESSFUL FUNDING: COMBINING RADIOTHERAPY AND IMMUNOTHERAPY TO IMPROVE OUTCOMES

In May this year, Professor Tim Illidge's CRUK programme grant was successful in achieving renewal of major funding totally £1.8million from Cancer Research UK. The programme is centered around 'Understanding the mechanisms of combining radiotherapy and immunotherapy to improve cancer outcomes.' Tim, Professor of Targeted Therapy and Oncology and Honorary Consultant Oncologist, stated: "these are exciting times for use of immunotherapy or immune-oncology agents in cancer therapy."



PRECISION-PANC PLATFORM PRECISION MEDICINE IN PANCREATIC CANCER



10,000 people are diagnosed in the UK each year with pancreatic cancer, which is a very complex cancer with few effective treatments.

The Precision-Panc Platform, founded in 2017, brings together experts in pancreatic cancer from the University of Glasgow, CRUK Beatson Institute, CRUK Cambridge Institute, CRUK Manchester Institute, the Institute of Cancer Research in London, the University of Oxford and the NHS.

The Precision-Panc Platform has facilitated a UK wide network of over 20 hospitals that can offer precision medicine clinical trials to patients with pancreatic cancer, with over 250 participants recruited so far. Precision medicine clinical trials, based in the genomics of the patient and their tumour, offer hope for the 85% of pancreatic cancer patients who are not eligible for surgery.

The overall aim of this research study is to improve the outcomes of patients with pancreatic cancer. It is designed to achieve this by studying of the genetic make-up of the cancer, in order to find out what the most effective treatment for each individual patient might be. It also aims to learn more about when, how and why people develop pancreatic cancer. We also hope to be able to predict which people are at risk of developing pancreatic cancer.

ESCALON – EUROPEAN-LATIN AMERICAN NETWORK FOR THE ASSESSMENT OF BIOMARKERS TO PREDICT AND DIAGNOSE HEPATOBILIARY MALIGNANCIES AND CHARACTERIZATION OF RISK FACTORS FOR CANCER DEVELOPMENT:

Professor Juan Valle from The Division of Cancer Sciences and Dr Angela Lamarca from The Christie NHS Foundation Trust (Honorary Senior Lecturer at UoM) are both investigators within the ESCALON consortium. The ESCALON project aims to understand, predict and diagnose hepatobiliary tumours using biomarkers found in the blood. This international research consortium is developing cost-effective tools for the early diagnosis of hepatobiliary cancers in Latin America and to identify factors that allow for risk stratification and primary prevention for these tumours. The Manchester team are supporting the project not only by active participation in the research but also by providing expertise in the field.

UROLOGICAL CANCER

The Genito Urinary GU research group based at The Christie NHS Foundation Trust and CRUK Manchester Institute have collaborated with the urology team at Salford Royal NHS Foundation Trust and others to fundamentally change international practice in the treatment of prostate cancer.

The research fellow programme at Salford have published their findings in the highest ranking medical and cancer journals and recognised at top cancer centres around the world will improve the lives of millions of men diagnosed with prostate cancer.

The GM team co-leads (with other international experts) the world's largest prostate cancer trial called STAMPEDE (Systemic Therapy in Advancing or Metastatic Prostate Cancer: Evaluation of Drug Efficacy). This trial aims to assess new treatment approaches for people affected by high-risk prostate cancer, with over 11,000 patients recruited to date.

STAMPEDE, co-led by Professor Noel Clarke of The Christie and Salford Royal, has generated the world's largest image bank for men with high risk prostate cancer which will enable further analysis and influence clinical practice in this area across the world.



EXCELLENCE IN THE TREATMENT OF UROLOGICAL CANCER

Noel Clarke, Professor of Urological Surgery was awarded the St Peters medal in 2019, for notable contribution to the advancement of urology.

PROSTATE RESEARCH AWARD

This year, the Urology team at Salford were awarded the Prostate Cancer Foundation Challenge award jointly with University College London, an international recognition of research excellence. The team have also acquired over £4m in grant funding to continue national/international research and audit initiatives.

CENTRES OF EXCELLENCE

Greater Manchester is home to two outstanding Prostate Cancer Centres of Excellence; FASTMAN and the General Urology (GU) Cancer Research Group. The Manchester-Belfast FASTMAN Centre of Excellence has been awarded an additional £1.25m to expand research into clinical trials, heterogeneity, radiomics and image utilisation. The work of the GU research group's basic and translational science research teams has resulted in changes in international guidelines and to the way prostate cancer is treated, prolonging survival in many thousands of men around the world.

DEVELOPING LIQUID BIOPSIES TO DETECT EARLY SIGNS OF LUNG CANCER

Every year, around 46,700 people are diagnosed with lung cancer in the UK alone. Sadly, only 1 in 20 will survive for 10 years or more – a number that has not improved in the past decade. One of the reasons for such poor survival is that lung cancer is often diagnosed late when it has already spread, so there is a clear and urgent need to detect this cancer sooner.

At the forefront of this effort is Professor Caroline Dive, who is based at the CRUK Manchester Institute and regarded as one of the leading authorities on monitoring cancer using patients' blood. To do this, she looks at 'circulating tumour cells' (CTCs), specifically in the context of lung cancer. CTCs are cells that have broken away from the tumour and entered the bloodstream, which could be detected using a simple blood test.

This approach – known as a 'liquid biopsy' – also has the potential to provide doctors with a more simple and less invasive way to monitor a patient's treatment. As we know, cancer can become resistant to treatment over time, but traditionally the only way to monitor this is via repeated solid tumour biopsies, which may not even be possible as the disease progresses or where tumours are in difficult-to-reach places, such as the lung. Liquid biopsies would provide doctors with regular updates on the molecular profile of the patient's tumour, allowing them to monitor the effectiveness of new treatments and switch treatments earlier if the tumour shows signs of resistance. Following treatment, they could also show doctors how likely it is for their cancer to come back.

The biggest challenge in the development of this technique is that although cancer cells are very different to normal cells, it is difficult to spot them in the blood. In a millilitre of blood, there are only around 200 tumour cells compared to around five billion healthy red blood cells. The test must be sensitive enough to detect the cancer cells and accurate enough to ensure healthy blood cells are not misdiagnosed as CTCs, as this could interfere with the results.

If it is successful, this simple, precise and non-invasive way of tracking tumour cells has the power to completely change the way we treat and manage lung cancer, one of the hardest cancers to treat.



OUTSTANDING CONTRIBUTION TO CANCER RESEARCH:

Professor Caroline Dive was named Faculty of Biology, Medicine and Health's Researcher of the Year at UoM's 2019 Distinguished Achievement Awards for her outstanding contribution to the field of biomarker research. Professor Dive was also awarded the Heine H. Hansen Lectureship Award for Small Cell Lung Cancer by the International Association for the Study of Lung Cancer (IASLC) in recognition of her long-standing work in the field of basic sciences.

POLICY RESEARCH: PILOTING AN OUTCOMES-BASED PRICING MODEL FOR CANCER DRUGS IN MANCHESTER

Advances in drug development today are offering hope to millions of cancer patients, but translating these advances into routine drug access within the NHS remains a challenge. Currently, the NHS pays a certain price for a new drug based on the National Institute for Health and Care Excellence (NICE) recommendations made at a single point in time and often on immature data. In an 'outcomes-based' system, the price can be aligned directly to the most recent data on patient benefits, including how well the drug works in a real-world setting and whether patients experience relapses in their cancer. The price can also be changed over time as new data becomes available.



We believe that cancer patients should have access to the best cancer drugs, so Cancer Research UK are partnering with the Greater Manchester Health and Social Care Partnership to conduct a pilot study into how feasible an outcomes-based payment scheme would be within the NHS. This will provide vital evidence for this pricing system, which could remove barriers to drug access for patients and be more cost-effective for the NHS.

RADIOTHERAPY

RADIOTHERAPY RESEARCH EXCELLENCE IN LUNG CANCER

Professor Corinne Faivre-Finn was awarded the 2019 James D. Cox Lectureship Award for Radiation Oncology, the highest accolade awarded by the International Association for the Study of Lung Cancer (IASLC) for any researcher in radiation-related research.



MR-LINAC

2019 saw the first patient treated at The Christie using the Elekta Unity MR-Linac (Magnetic Resonance Linear Accelerator). The MR-Linac provides high-quality images during treatment through combining high-field MRI technology with a linear accelerator which allows the treatment team to adapt the radiation dose on a daily basis, to truly personalise the radiotherapy treatment. While this is expected to lead to better tumour control and fewer side effects it is crucial to show that the advanced technical capabilities of MR/RT translate into real benefits for the patient, such as prolonged disease-free survival and better quality of life.

The international MR-Linac registry study, 'MOMENTUM' is designed to generate data that will enable the safe, fast and, above all, 'evidence-based' introduction of magnetic resonance radiation therapy (MR/RT) into clinical practice. The study will focus on building a robust body of real-world clinical evidence and insights made possible by this technology. Information gained through the MOMENTUM study (opened 2019) will guide the use of MR/RT to improve outcomes for cancer patients.



MR-LINAC USED TO TREAT FIRST PATIENT

“David was diagnosed with prostate cancer in September 2018 having already just been diagnosed with skin cancer in 2017 and treated for throat cancer in May 2016.

David, who lives with his wife Valerie and is father to twin sons Matthew and Thomas, both 28, said: “I’m really excited to be the first patient to be treated with the MR-linac at The Christie.

“I’d researched prostate cancer treatment a lot and heard about this machine. So I wrote to Professor Choudhury at The Christie personally to request that I be considered for first treatment.

“I have had a very difficult time with cancer and I believe the treatment will give me a better quality of life and minimal side-effects in comparison to other treatments.

“It’s nice to know that my treatment will help research treatments for cancer patients in the future.”



RadNet MANCHESTER

In 2019, Greater Manchester secured an investment of £16.5million from Cancer Research UK’s, Radiation Research Network (RadNet) Centres of Excellence. As one of seven centres of excellence in a UK-wide network, RadNet Manchester, in collaboration with The Christie NHS Foundation Trust will provide national leadership and vision, and develop and grow the radiation research base within the UK.

RadNet Manchester is an ambitious translational radiation oncology programme that builds on the 10-year ‘Team Science’ approach to cancer radiotherapy-related research (RRR). Led by Professor Rob Bristow, this investment will provide a large increase in infrastructure resource through collaborative hubs.

The team will further develop new technologies (protons, MR-Linac, FLASH) to increase the physical and biological precision of radiotherapy, and identifying new agents to combine with radiotherapy. Using multi-disciplinary expertise, the team will address the challenges of diverse patient characteristics to achieve individualised physical and biological targeting based on real-time outcomes and work towards a deep mechanistic understanding of immune response, comorbidity and genomics.



CANCER RESEARCH UK

RADNET MANCHESTER

- National proton biology research
- Clinical informatics and distributed learning methods to learn from every patient treated
- Leading practice-changing biomarker-driven trials
- Embedding radiotherapy-relevant biomarker discovery and validation research in studies across the UK
- Doctoral training academy for radiographers

PROTON BEAM THERAPY

The Christie NHS Foundation Trust is home to the first UK high-energy proton beam therapy centre, which opened its doors in late 2018 and over the past year has provided treatment to over 100 patients. Proton beam therapy enables radiotherapy to be more precisely targeted at the cancer, reducing the damage to surrounding healthy tissues. This is especially important for certain groups of patients such as children and young adults, or where the cancer is close to a critical part of the body such as the spinal cord. It may also reduce long-term side effects for other patients, which is being looked at as part of clinical trials.

In December 2019, a launch meeting was held for the UK’s first proton beam therapy study, called TORPEDo, with 85 attendees including trial teams from The Christie, the University of Manchester, The ICR Clinical Trials and Statistics Unit (ICR CTSU), Radiotherapy Trials Quality Assurance (RTTQA), University College London Hospitals (UCLH), and 14 other hospitals from around the country.

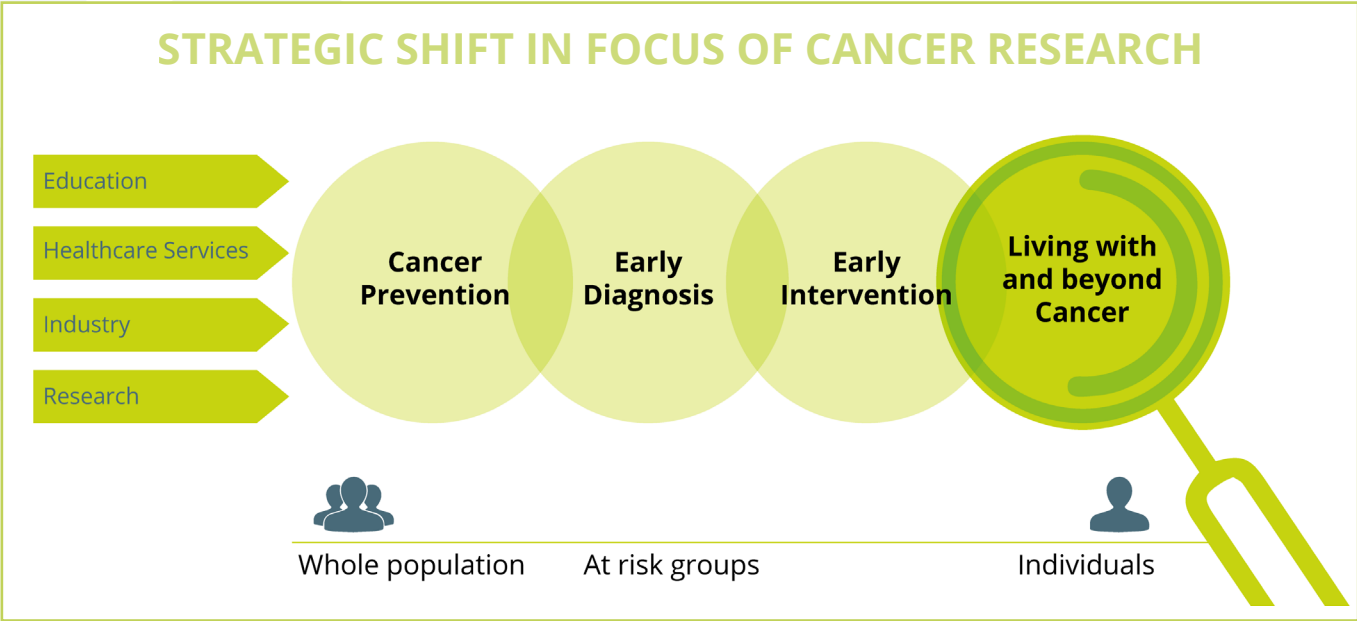
The study is a multi-centre UK phase III trial to assess whether intensity modulated proton beam therapy (IMPT) reduces treatment side effects compared with intensity modulated radiotherapy (IMRT) for patients with tonsil or base of tongue cancer. The study is funded by Cancer Research UK with additional support from The Taylor Family Foundation. It is expected to open for recruitment in early 2020.



5. PERSONALISED ON-GOING CARE

As a result of the enormous progress made in early detection and treatment, survival rates for patients diagnosed with cancer continue to increase. The number of people living after a cancer diagnosis is growing by approximately 3% per year and this is estimated to equate to almost 4 million people by 2030. However, not all patients are 'living well' after a cancer diagnosis; almost 25% will face long term health or disability problems following their treatment.

In Greater Manchester we are seeing a strategic shift in the focus of cancer research. Whilst incredible research continues into the prevention and early diagnosis of cancer and new treatments are developed continuously, we have seen an increase in the need to research what happens to patients following a cancer diagnosis.



Patients need appropriate follow-up and support after their diagnosis and treatment. We have an opportunity in (GM) to facilitate high quality research in this area to maximise quality of life and survival for these patients.

Professor John Radford, Director of Research at The Christie is leading this programme of work in GM with the ambition to:



- Develop a national centre for Living Beyond Cancer Science in Manchester
- Integrate translational and clinical science relating to this area of research
- Integrate non-cancer and cancer specialists across GM to address the multi-morbidity agenda in cancer patients and identify/evaluate relevant interventions
- Develop a focus on reducing toxicity as endpoints in trials of therapies in stratified populations

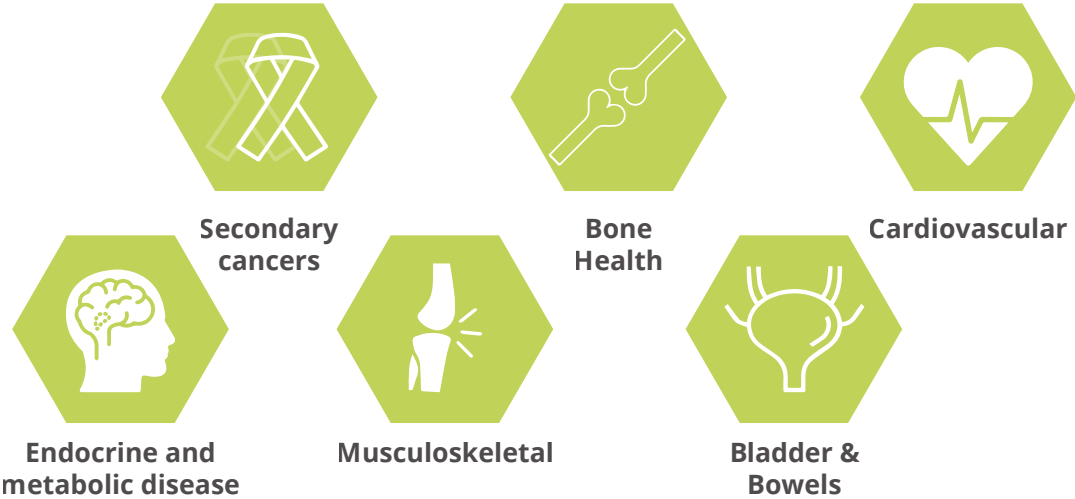
MANAGED LOCAL FOLLOW-UP OF LONG TERM CANCER SURVIVORS (ADAPT):

Manchester clinicians and researchers in collaboration with the NIHR Manchester Patient Safety Translational Research Centre and Connected Health City have developed an individualised long term management plan to optimise health and wellbeing in patients cured or in long term remission following treatment for cancer.

ADAPTEd patients are provided with relevant information and advice and are no longer seen in the oncology clinic on a routine basis but can easily access this if the need arises.

With the support of NHS Commissioners, since April 2018, a total of 825 patients have so far been recruited onto ADAPT which has been integrated into PINGR (GP electronic record) and rolled-out across Salford. Patient and GP feedback has been excellent, with the development of a patient facing website and app (e-ADAPT) and in collaboration with Health Innovation Manchester the next step is roll-out across GM.

The structure of the new Centre for Living Beyond Cancer Science in Manchester will focus on the following workstreams:



6 PhDs have been funded or are underway in the following areas; bone health, lung cancer screening, radiotherapy and heart toxicity, individualised risk score integrating radiotherapy dose and breast density, lived experience in the teenage and young adult population and pelvic radiotherapy dosage and toxicity.

OSTEONECROSIS STUDY

A study, funded by NIHR has provided the first insight into the experience of osteonecrosis (ON) in Teenagers and Young Adults (TYA) living with and beyond cancer. Osteonecrosis was found to have a wide-ranging, negative impact, with much uncertainty surrounding living with the condition. The study highlighted the need for future research into multiple aspects of cancer-related ON in TYAs, and for improvements in the information and support provided to young people with the condition. The findings have contributed to the development of consensus guidance on the management of ON in Teenagers and Young Adults, through the national Teenagers and Young Adults with Cancer multi-professional group: Nicola Chesman (Specialist Physiotherapist for Teenagers and Young Adults with Cancer).



BODY IMAGE

In September, Anna Mackland an Occupational Therapist on the TYA unit at The Christie started a research internship with the NIHR focusing on the development of body image interventions for Teenage and Young adults with a cancer diagnosis. This research project involves a literature review in order to establish the best evidence based approach to body image interventions in order to develop the service that is currently provided.



PANDA STUDY

Pancreatic exocrine insufficiency (PEI) in pancreatic cancers is known to negatively impact on overall survival and quality of life. A lack of consensus remains on the optimal diagnostic test that can be adapted in a clinical setting for this cohort of patients. The PanDA study, based at The Christie, aims to identify the most informative and least-invasive diagnostic tool for PEI. The study hopes to find a better and more patient-friendly way to diagnose these digestive problems. Alongside this, the study will evidence the benefit that patients can gain from seeing a specialist dietitian. The early diagnosis and treatment of digestive problems may help to improve symptoms and the wellbeing of patients in the future, including fitness to receive treatment for their cancer.



BRINGING RESEARCH CLOSER TO HOME – OUTREACH

Our vision in Greater Manchester (GM) is to reduce social inequality and increase access to cutting edge cancer medicines for our population. Providing experienced leadership and encouraging collaborative working between health care providers and community teams we will facilitate access to the very best treatment innovations closer to patient’s homes.

We know access to innovative new treatments in clinical trials extends and improves the length and quality of life for cancer patients. Delivering these opportunities for patients equitably across the large geography of GM presents a great challenge.

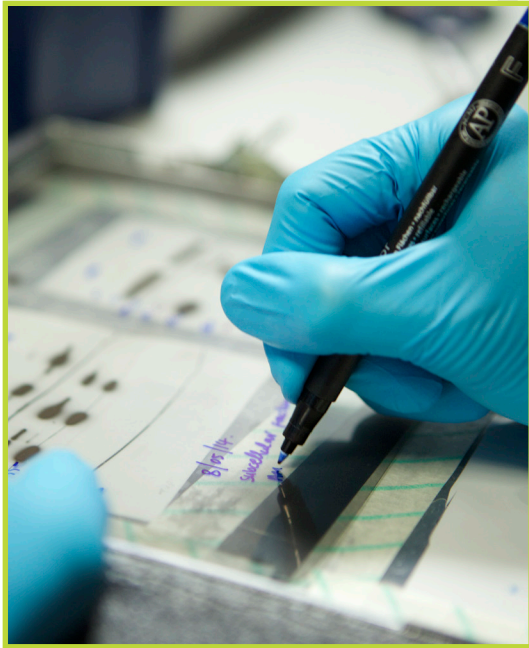
Prof Andrew Wardley (medical oncologist and clinical director of the Manchester Clinical Research Facility at The Christie) and his team aim to reduce the inequalities in access to Systemic Anti-Cancer Therapies by reaching all of GM’s population through an outreach programme of work.

The programme focuses on combining research as part of standard service. By adopting a hub and spoke model and continuing to work in partnership with neighbouring Trusts to deliver a high quality service and increase recruitment activity into clinical trials.

The programme demonstrates our willingness to build long term and sustainable relationships both with trusts and industry partners, not just in Greater Manchester and Eastern Cheshire, but across the North and the rest of the UK.

THE BENEFITS OF THIS COLLABORATIVE APPROACH ACROSS TRUSTS INCLUDE:

- Improved equity of access to a greater range of treatment options and clinical trials
- Reduced travel burden, making access to trials and treatment easier
- Access to best possible care
- Improved life chances
- Improved patient experience



ePROMs – ELECTRONIC PATIENT REPORTED OUTCOME MEASURES

The Christie NHS Foundation Trust is introducing an innovative new £4 million service, following a successful evaluation phase. The service is funded by The Christie Charity and The Christie NHS Foundation Trust, and is called MyChristie-MyHealth. This service enables patients to report their symptoms, general health and quality of life through online questionnaires (electronic Patient Reported Outcome Measures or ePROMs). This encourages better communication with patients and their clinical teams, leading to more personalised and patient-centred care. Research has shown that introducing ePROMs in routine patient care results in better overall survival, quality of life and symptom management, as well as in fewer hospital stays. It is believed that The Christie will become one of the first cancer centres internationally to roll-out the initiative to all its patients across the whole organisation.

A successful pilot was completed last year and included the roll-out of the service in lung and head and neck patients and in patients treated with Proton Beam Therapy (16 years old and above). Patients received a text message or email on the day of a new appointment and 3 days before a follow-up appointment with a link that provided access to the online questionnaires.

FEEDBACK FROM OVER 100 PATIENTS HAS BEEN OVERWHELMINGLY POSITIVE;

99%

of patients found the service quick and easy to use

88%

felt more involved in their care

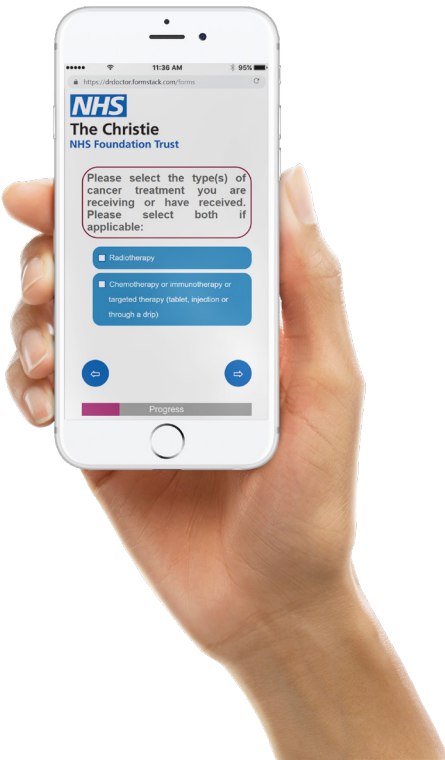
82%

improved their communication with their clinical team

“Quick and easy to report any issues or problems ahead of appointments...”

“I think the service is a great idea and puts my mind at rest...”

“I think it’s a great idea for keeping patients and doctors in touch...”



The Christie has also received a number of high-profile grants (CRUK RADNET and CRUK Major Centre) that are reliant on the availability of ePROMs for their delivery. The initiative will help the Christie realise its strategic vision to become one of the top five cancer centres worldwide by 2025. The introduction of the service will also facilitate world-leading, cross-cutting, existing and future research. Since the initial roll out of the service in January 2019, more than 3000 questionnaires have been completed by patients and data from these will feed into a real-world clinical research programme. The amount of data provided through the service is expected to expand rapidly following the recent investment to the initiative and will put The Christie at the forefront of Real World data for Outcomes Research, whilst enabling further research partnerships.

Future work involves Trust-wide roll out of ePROMs and their use to drive personalised follow-up and develop a real-time patient responsive service. This will ensure that patients are at the heart of everything we do and that the care they receive is tailored to their needs.

DIGITAL TECHNOLOGIES

The Christie NHS Foundation Trust is transforming patient care through adoption of new technology to support the delivery of best outcomes to patients. Their investment programme covers a diverse range of initiatives including:

- **Wearable devices**
- **At home and remote monitoring**
- **Patient reported outcomes**
- **Machine learning in supporting decision making**
- **Development of real-world outcome data platforms**

This programme enables our patients to receive more personalised health care leading to better outcomes.

We are also investing in the future of our research workforce by working in close collaboration with the University of Manchester, developing a culture of Team Science and educational materials that keep us at the forefront of research.



6. EDUCATION

Education and training lie at the heart of GM's vision for developing the next-generation of world-leading cancer scientists. To achieve this goal, scientists and clinicians are offered various postgraduate courses, from Masters in Experimental Cancer Medicine, to clinical and non-clinical PhD programmes, through to postdoctoral and senior lectureship positions.

Across the GM partnership, there are almost 300 currently active PhD projects, with individuals working on various research projects spanning basic and translational science which seek to identify the next innovation and ultimately improve patient care. There are several different PhD pathways available, for both clinical and non-clinical candidates covering a range of research themes including early detection, immune-oncology, and radiotherapy.

Manchester is offering a **new MB-PhD programme** to train clinician scientists, as part of Cancer Research UK's Clinical Academic Training (CAT) Programme.

The CAT Programme Award will support nine programmes across the nationwide network of CRUK Centres to offer early career clinician scientists greater flexibility and a wider range of training options, while providing training of the highest quality. The first cohort of students will integrate onto a PhD in cancer sciences in 2020. This novel curriculum of doctoral research within the traditional medical degree will expose students to the world of academic research, providing them with a pathway to success in academic oncology.



New PhD projects and new initiatives are providing rigorous and highly competitive training for early career researchers to become the next-generation of cancer research leaders within Greater Manchester.

ASCO EDUCATION SCHOLAR

In August, Dr Mairéad McNamara was selected to join the American Society of Clinical Oncology's (ASCO) highly competitive Education Scholars' Programme. This year-long programme trains participants to become exemplary teachers, who effectively spread the latest knowledge about cancer research and treatment to the oncology community, through ASCO's educational offerings, as well as within the participants' institutions.



ACADEMY OF MEDICAL SCIENCES FELLOWSHIPS

May 2019 saw The Academy of Medical Sciences elect 50 of the UK's leading figures within biomedical and health sciences to their esteemed Fellowship. Amongst those 50 were MCRC Director Professor Rob Bristow and Professor John Radford, Clinical Director of Research at The Christie NHS Foundation Trust and Professor of Medical Oncology at the University of Manchester. The new Fellows have been selected for their outstanding contributions to advancing medical science, cutting edge research discoveries, and translating developments into benefits for patients and wider society. Many of the new Fellows have also made a contribution to medical science through outstanding leadership, public engagement and supporting the career advancement of junior trainees.



NEW ADVANCED THERAPIES MASTERS (MSc)

The Advanced and Immuno cell therapies (AICT) team has successfully developed the UK's first Masters (MSc) programme in Advanced Therapies at The University of Manchester. The course accepted its first intake of students in September 2019.

FUNDING AWARD TO CLINICAL ACADEMIC TRAINING PROGRAMME

This year, the CRUK Manchester Centre was awarded £6.5m from CRUK's Clinical Academic Training Programme to establish an MB-PhD programme, and an Academic Researcher Clinical Training Innovation in Cancer programme (ARCTIC), in collaboration with the University of Leeds. These two programmes are set to drive novel approaches in the delivery of highest-quality doctoral research training.

RESEARCH AT THE GREATER MANCHESTER CANCER CONFERENCE

In November, GM Cancer held the second GM Cancer Conference in Manchester. The agenda and speaker programme combined clinicians, managers, patients and notably this year a focus on research collaboration. Research highlights presented to an audience of patients, scientists and healthcare professionals included progress in areas of Genomics, early detection and personalised medicine.



GREATER MANCHESTER CANCER
RESPONSE TO THE NHS LONG TERM PLAN

GMCA
GREATER MANCHESTER
COMBINED
AUTHORITY

NHS
in Greater Manchester

APPENDIX A

LTP aims	(1) By 2028, 75% of people will be diagnosed at an early stage (stage 1 or 2), (GM % stage 1 and 2 [2018/19, Q1] = 53.6%) (2) Delivery of National CWT standards	Prevention	Early Diagnosis	Treatment	Personalised on-going Care
				By 2028, 55,000 more people will survive cancer for five years or more each year. (GM figure would be approximately 2750)	

Appropriately skilled and resourced cancer workforce & sustainably funded core GM cancer alliance cancer team					
GM System Priorities	CURE Smoking cessation programme sustained delivery in admitted patients with expansion into mental health and non-admitting services (Linked to GM population Health programmes)	Screening (Deliver in Conjunction with Population Health Intervention)	Uptake GM screening uptake improvement programme focusing on health inequalities Effectiveness – FIT; Primary HPV screening; Targeted screening e.g. familial genetics testing (lynch etc.) Lung Health checks phased sustainable roll out across all localities in GM initially through 3 localities (<i>Manchester, Salford, Tameside & Glossop</i>) GP Education : Improve uptake of Gateway C Improving referral modules	Prehab4Cancer – 100% of patients offered appropriate prehab for Cancer before all treatment modalities Integration of GM services - Delivery (i) established surgical (ISC) transformation programmes;(ii) GM-level psychology, SACT, lymphoedema, palliative care & acute oncology (iii) National service specifications Advanced treatments – Ensure equitable access to latest treatments. Engage proactively in the national 'Call for innovations/ investment fund'	Personalised Care Ensure all appropriate patients have holistic needs assessment, care plan & health / wellbeing information
	HPV – Deliver HPV vaccination programme in boys		Rapid Diagnosis Centres (RDC) –Through at least 2 RDCs 100% of patients having access by 2024	Genomics – Mainstream Genomic medicine across GM into all cancer pathways.	Personalised Follow up Develop personalised tools & infrastructure, with initial focus on breast, prostate and colorectal before broader roll out to all patients by 2024
	Cancer Prevention Drugs - roll out in line with NICE Guidelines.		Accelerated timed Pathways – Adoption & further development across all disease pathways, using GATEWAY-C portal to improve awareness	MDT – Streamlining & standardisation with regular review of protocols, decision making and outcomes	Deploy National Quality of Life metric.
					Develop & integrate PROMS into digitally enabled personalised follow up tool(s) for all cancer pathways

Locality Cancer Priorities (Representing strategic commissioning & Provider Trusts)	Monitor, deliver, improve & sustain CURE programme (as above)	Screening – Develop & deliver screening uptake interventions through PCN & localities Monitor , evaluate & deliver screening enhancements & LHC program in each locality	Prehabilitation – Partner in development and sustainable delivery of prehabilitation MDT – Partner in MDT reform (see above)	Personalised follow up – Develop and sustainably deliver patient-friendly, digitally enhanced personalised follow up options
	Monitor, deliver, improve & sustain HPV vaccination programme (boys/ girls)	Rapid diagnosis centres/ referral practice - multi locality planning & delivery for the local population through PCNs (GP referrals) and localities	Transformation – Partner in the setup and local delivery of improving specialist care models (ISC, psychology, SACT, lymphoedema, palliative care, acute oncology & national service specifications	Coordinate 'people affected by cancer' access to suitable health and social care support to enable effective personalised care/ follow up
	Monitor, deliver, improve & sustain patient access to cancer prevention drugs in line with NICE defined targets	Accelerated timed pathways – 1) Monitor, deliver, improve & sustain '2) Ensure sufficient local diagnostic capacity to deliver FDS	Genomics – Partner in the modernisation of pathology practice to integrate genomic medicine pathways into patient care in a timely manner	

System dependencies	Population Health improvements in domains associated with cancer	Comprehensive access to cancer intelligence (eg FDS etc) to understand inequalities & evaluate progress	Deployment of digital radiology, digital pathology and radiotherapy clinically-networked services	Shared decision making tools
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Thank you all

Report produced by Greater Manchester Cancer, in collaboration with MCRC:

GM CANCER CONTACT INFORMATION



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