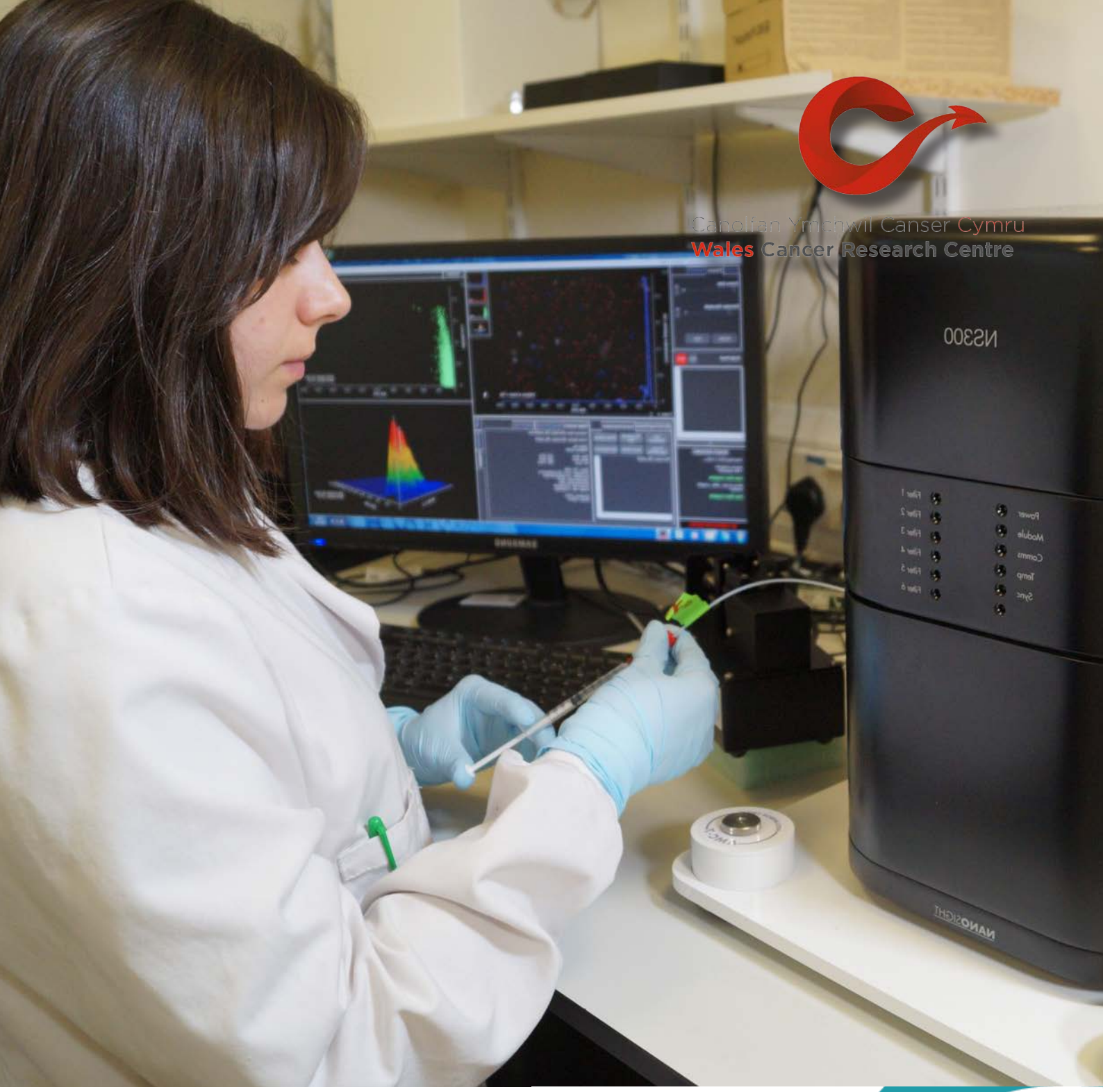



Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

Ariennir gan Lywodraeth Cymru
Funded by Welsh Government

# 2020 - 2021
# Annual report

# CONTENTS


| | |
|---|---|
| Page 2 | Introduction |
| Page 3 | Foreword |
| Page 5 | Lay Summary |
| Page 6 | Our Workstreams |
| Page 10 | Key Achievements |
| Page 24 | Looking Forward |



**The Wales Cancer Research Centre is funded by Welsh Government through Health and Care Research Wales.**

**This report has been compiled with input from our public and patient involvement group.**

# INTRODUCTION

***"Our vision is to work with cancer patients and other partners to develop and deliver research excellence that benefits the health and welfare of people in Wales and beyond."***

The Wales Cancer Research Centre is funded by the Welsh Government and is a key part of Health and Care Research Wales' infrastructure.

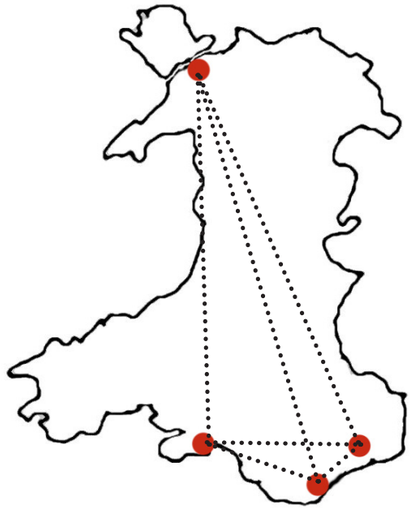
We perform and support cancer research of the highest quality, which builds on Wales' international research reputation, with a clear focus on collaboration, innovation and improved patient outcomes.

Our vision is to work with cancer patients and other partners to develop and deliver research excellence that benefits the health and welfare of people in Wales and beyond.

We fund 27 full and part-time posts and aim to improve collaboration in cancer research by bringing these staff and their colleagues together across Wales. Our researchers fulfill a broad range of roles including research nurses, academics, clinicians and biomedical scientists.

An External Advisory Board guides the centre in its work. It includes eight UK experts from across the cancer research spectrum and ensures that our research is of the highest quality and internationally relevant.

The centre has recently received £5 million funding renewal from the Welsh Government, through Health and Care Research Wales, to continue our research until 2025.



**Above: locations of our staff across Wales**

## OUR PARTNERS

Prifysgol Bangor University

Prifysgol Abertawe Swansea University

Cardiff University / Prifysgol Caerdydd

GIG CYMRU NHS WALES – Bwrdd Iechyd Prifysgol Aneurin Bevan University Health Board

GIG CYMRU NHS WALES – Bwrdd Iechyd Prifysgol Abertawe Bro Morgannwg University Health Board

GIG CYMRU NHS WALES – Bwrdd Iechyd Prifysgol Caerdydd a'r Fro / Cardiff and Vale University Health Board

Canolfan Ganser Felindre Velindre Cancer Centre



# FOREWORD

Welcome to the Wales Cancer Research Centre's annual report for 2020-21 – the first year of our second quinquennium of funding from Welsh Government, via Health and Care Research Wales. Our sixth year has coincided almost exactly with the worst of the COVID-19 pandemic. It has been a difficult year for so many in so many ways and our hearts go out to all those affected by coronavirus, including cancer patients, their families and friends and, of course, our cancer research community in Wales.

Whilst coronavirus has had an inevitable impact on our work, I am immensely proud of the efforts undertaken by our dedicated teams of researchers throughout the crisis. Many of our staff were seconded to work on important alternative tasks such as developing vaccines and running clinical trials against COVID-19. Dozens from our cancer research community have commendably and selflessly adapted their skill-sets to meet the global challenge. One example of the unique contribution made by cancer researchers in Wales lies in the work of Prof. Alan Parker's team, which you can read about on page 10.

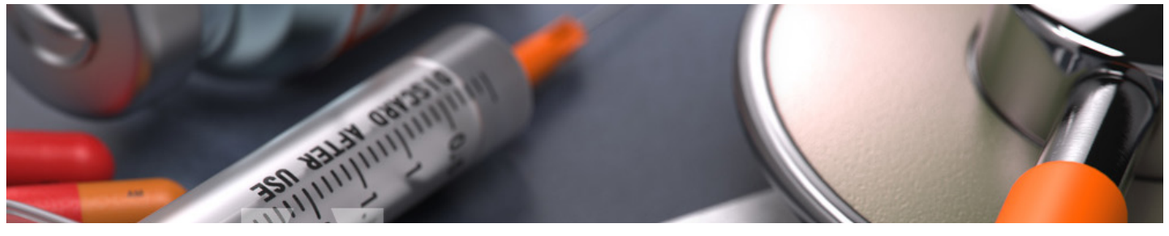
Of course, our vital work against cancer has not stopped, thanks to the flexibility of our researchers to the extremely challenging circumstances. Despite the need to limit numbers of researchers on site, our laboratories have remained open throughout much of the lockdown periods, whilst many others have adapted to researching from home. Our multi-disciplinary research groups have continued to meet virtually, and events such as our conference for nursing and Allied Health Professional researchers have had to be online. Although there was an initial, unavoidable drop in overall activity, we are now back up and running at close to full capacity. There have even been unexpected benefits, with savings in travel time and greater equity of access for researchers from across Wales.

The following pages illustrate the impressive and inspiring efforts of our dedicated and determined research community who have been working hard together on keeping patients at the centre of all that we do. Our new approach for the new quinquennium, illustrated on page five, continues to keep patients at the centre of all that we do, focussing more than ever on the things that matter most to patients and their families.

- Our Personalised Prevention research focuses on developing and evaluating strategies to encourage healthier lifestyle choices, such as stopping smoking or maintaining a healthy diet.
- Our Enhanced Diagnosis work has a strong focus on inter-disciplinary working to evaluate technologies that could improve the diagnosis of cancer.
- Our Improved Patient Outcomes workstream brings lab scientists and clinical researchers together to develop new, improved therapies for patients through our innovative Multi-Disciplinary Research Groups model.
- Our Optimised Patient Experience work ensures that the research that we conduct is driven by the needs and preferences of patients, their families and carers.

Public and patient involvement and engagement remains the golden thread that ties our all work together, helping us to improve the lives of all those in Wales who are affected by cancer.

**Prof. John Chester, Director**



# OUR RESEARCH IN NUMBERS

**Core Metrics**
Reporting period: **2020/2021**

Canolfan Ymchwil Canser Cymru
Wales Cancer Research Centre

**Health and Care Research Wales infrastructure award to the group**

Direct funding awarded
**£975k**

Jobs created through direct funding
**21**

## Grants won during reporting period

| Grants won | Led by group | Group collaborating |
|---|---|---|
| Number | 18 | 6 |
| Value | £4.6m | £3.1m |
| Funding to Wales | £3.5m | £2.7m |
| Funding to group | £3.2m | £121,000 |
| Additional jobs created for Wales | 21 | 3 |
| Additional jobs created for group | 15 | 1 |

**87**
Number of publications

**4**
Number of public engagement events

**128**
Number of public involvement opportunities

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

Llywodraeth Cymru
Welsh Government



# LAY SUMMARY

The Wales Cancer Research Centre is conducting excellent research to improve treatments, clinical decision making and quality of life for patients. Cancer is a disease no one wants to face, yet one in two of us will develop it in our lifetime. In Wales alone, around 120,000 people are currently living with cancer, and this figure is set to almost double in the next fifteen years.

We are building on, and extending, ground-breaking research which has contributed to a doubling in cancer survival in the last forty years. Now half of all cancer patients survive for ten years or more. We are working hard to do even better.

We employ 27 members of staff at all levels of research, including nurses, doctors and laboratory researchers. Together they carry out research at every stage, from understanding the scientific basis of cancer to developing treatments that improve the health and wellbeing of individual cancer patients.

Tackling cancer is a huge, global challenge, but we're successfully treating more cancers than ever before. We believe that, by working together, within Wales and internationally, we will meet the challenge.

We hope that the work of the Wales Cancer Research Centre, leading in several areas and collaborating effectively in others, will continue to play its part in helping us reach our goal.

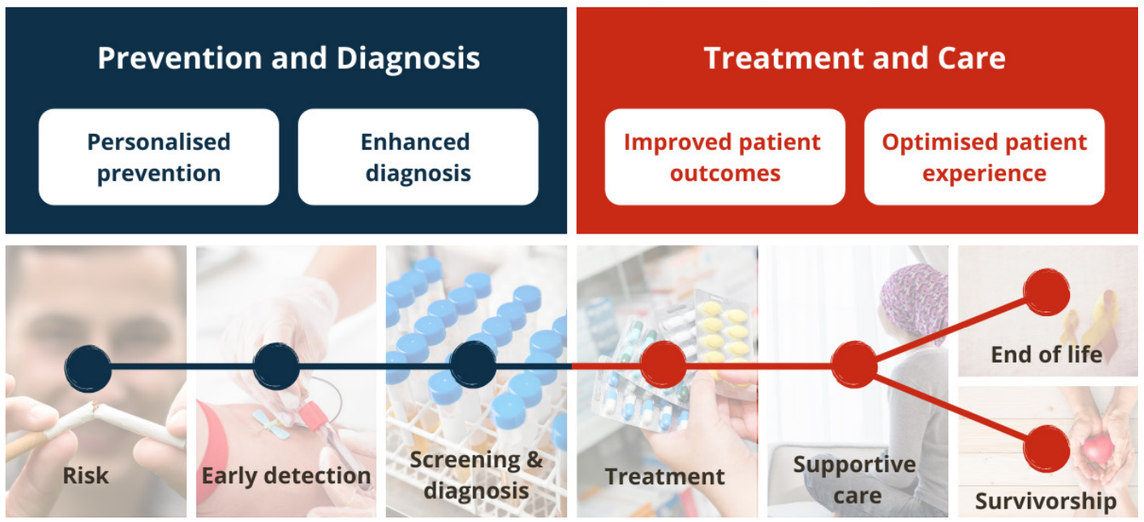
## Public, Patients & Carers

At every stage of our work we aim to involve the public, carers and patients in our research. We believe that they are not just the focus of our research, but should be active participants, working with researchers to plan, manage, carry out and publicise our work. We have appointed, trained and provide on-going support to a team of six members of the public who work with research staff across the centre. In the last year they have ensured that the research we conduct is relevant, they have contributed to trial recruitment and improved the process for informed consent for tissue donors.

We regularly engage with the public to increase knowledge about the importance of cancer research, and how it is conducted in Wales. We organise events and bring our research to museums, festivals and busy public spaces. This allows the public direct access to our researchers through talks, activities and hands-on tours of our research sites. Our engagement work has impacted on young people's interest in studying science, public knowledge of personalised medicine and improved public awareness of clinical trials.

**If you are a member of the public who is interested in getting involved in our research, please email us on WCRC@Cardiff.ac.uk.**

## Research that follows the patient journey



# OUR WORKSTREAMS

## Personalised prevention

Our personalised prevention research focuses on developing and evaluating strategies to encourage healthier lifestyle choices in high-risk groups of people, such as stopping smoking or maintaining a healthy diet.

We are building on our strengths in screening, prevention and early diagnosis to reduce the burden of cancer on the people of Wales and beyond. We do this by conducting research that helps prevent cancer wherever possible, which picks up abnormalities at the pre-cancerous stage or which detects cancer in its earliest stages before it can grow and spread.

We are using population data to:

- Improve lung health by increasing awareness of lung cancer symptoms and encouraging people in deprived communities to seek help.
- Look at genetic and lifestyle factors and link these with data on bowel cancer awareness to investigate:
  - Utilising artificial intelligence to analyse data and better understand cancer risk.
  - Behavioural (e.g. diet) and therapeutic (e.g. prescribing medicines) prevention strategies in colorectal cancer.

## Enhanced diagnosis workstream

We have a strong focus on inter-disciplinary working to evaluate technologies that could improve the diagnosis of cancer.

We are working on improving the detection of early cancers and pre-cancerous bowel polyps using new imaging technologies and specially engineered bacteria that help us to identify areas of risk.

We are developing more effective ways of predicting patients' outcomes using biomarkers - tests which tell us about the current state of a tumour or its likely behaviour. Two highlights in this area include:

- Telomeres are the end parts of a chromosome: measuring them gives an insight into a patient's prognosis. We are building on previous success in analysing telomere length and how this can be applied to help better predict how fast a patient's cancer will grow. Having this information will enable doctors to prescribe the most appropriate treatments.
- We are continuing to develop simple blood tests to spare patients a potentially intrusive biopsy by focusing on detecting DNA and exosomes that are released into the blood from tumours.

## Improved patient outcomes

We are bringing lab scientists and clinical researchers together to develop new, improved therapies for patients through our innovative Multi-Disciplinary Research Groups model.

We are developing new cancer therapies to improve treatment options available to patients. We have particular strengths in molecularly-targeted 'biological therapies' which exploit the differences between cancer cells and normal cells such as:

- Small-molecule drugs which target abnormal cell-signalling processes within the cancer cell
- Immunotherapies which harness the power of the immune system to destroy cancer cells
- Engineered 'oncolytic' or 'cancer-busting' viruses.

We have already proven our ability to improve access for patients in Wales to the latest developments from laboratories in Wales and elsewhere via clinical trials in NHS Wales' hospitals. You can find out more about the success of our TaCTiCC trial and forthcoming trial of our innovative anti-Bcl3 drug on our website.

We are determined to increase the availability of clinical trials offering the latest experimental treatments to patients. These are particularly useful for those who have run out of 'standard' treatment options. We work closely with academic and commercial sponsors, trials units and clinical research facilities in Cardiff and Swansea to increase the quality, quantity and variety of trials available to patients. Conducting these types of trials helps us identify where treatments can be improved and guide where our laboratory work should focus. Our main strengths lie in:

- Treatments that combine drugs and radiotherapy
- New ways of delivering drugs to cancer cells
- Studies of personalised treatments, including those using a patient's own immune system to tackle cancer
- New cellular therapies conducted in association with the Wales/Midlands Advanced Therapies Treatment Centre (WM-ATTC).

We continue to develop a portfolio of new radiotherapy trials, with particular expertise in developing personalised studies for lung and upper GI cancers, and an emerging strength in brain cancers. We will design new research studies involving advanced radiotherapy techniques, including:

- Stereotactic radiotherapy, which uses 3D imaging to target high doses of radiation to the affected area with minimal impact on the surrounding healthy tissue.
- Novel combinations of drugs and radiotherapy for more effective combined treatment.
- Proton Beam Therapy, which uses the unique properties of protons to reduce the dose of radiation to critical structure, but is still a very new technology.

In addition, we are working with experts in computer science to employ automation throughout the radiotherapy pathway and to study computerised analysis of imaging data (radiomics) of patients undergoing radiotherapy. The systems we develop for this work will form part of the platform for large scale databasing of patients at different stages of their cancer journey. Our long term aim is to personalise treatment choices for our patients using all available medical and patient-related information.

## Optimised patient experience

Patients are at the heart of everything we do. We work with our lay partners in 'co-production' which ensures that the research which we conduct is driven by the needs of patients, their families and carers, and of the community as a whole. This includes working together to ensure that the best interests of patients are always foremost in our research and to design innovative studies which prioritise their personal values and preferences at the centre of their personalised treatment plan. This is particularly important in the setting of advanced disease, where eradicating the cancer may no longer be possible. In this case we want to find the best ways to balance a patient's quantity and quality of life to suit their individual wishes.

**Personalised, physiological, pre-treatment assessment**

Current methods for determining an individual patient's underlying fitness and predicting their tolerance of potentially toxic treatments are crude and prone to bias. We are assessing the relationship between a patient's tolerance of treatment and other aspects of their well-being, such as how it affects their ability to perform tasks, their metabolism, inflammatory response and physiological assessments.

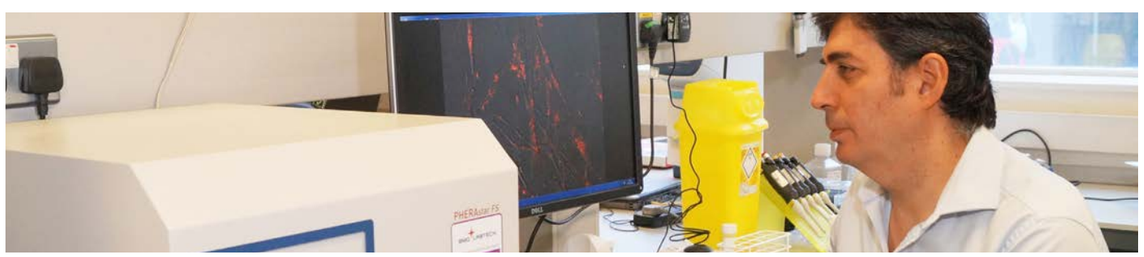
**Assessment of individual patient experiences, during and after treatment**

We extend our previous work on patient-reported outcome measures (PROMs) and patient-reported experience measures (PREMs) to patients undergoing chemotherapy for advanced lung cancer who have a curative prognosis.

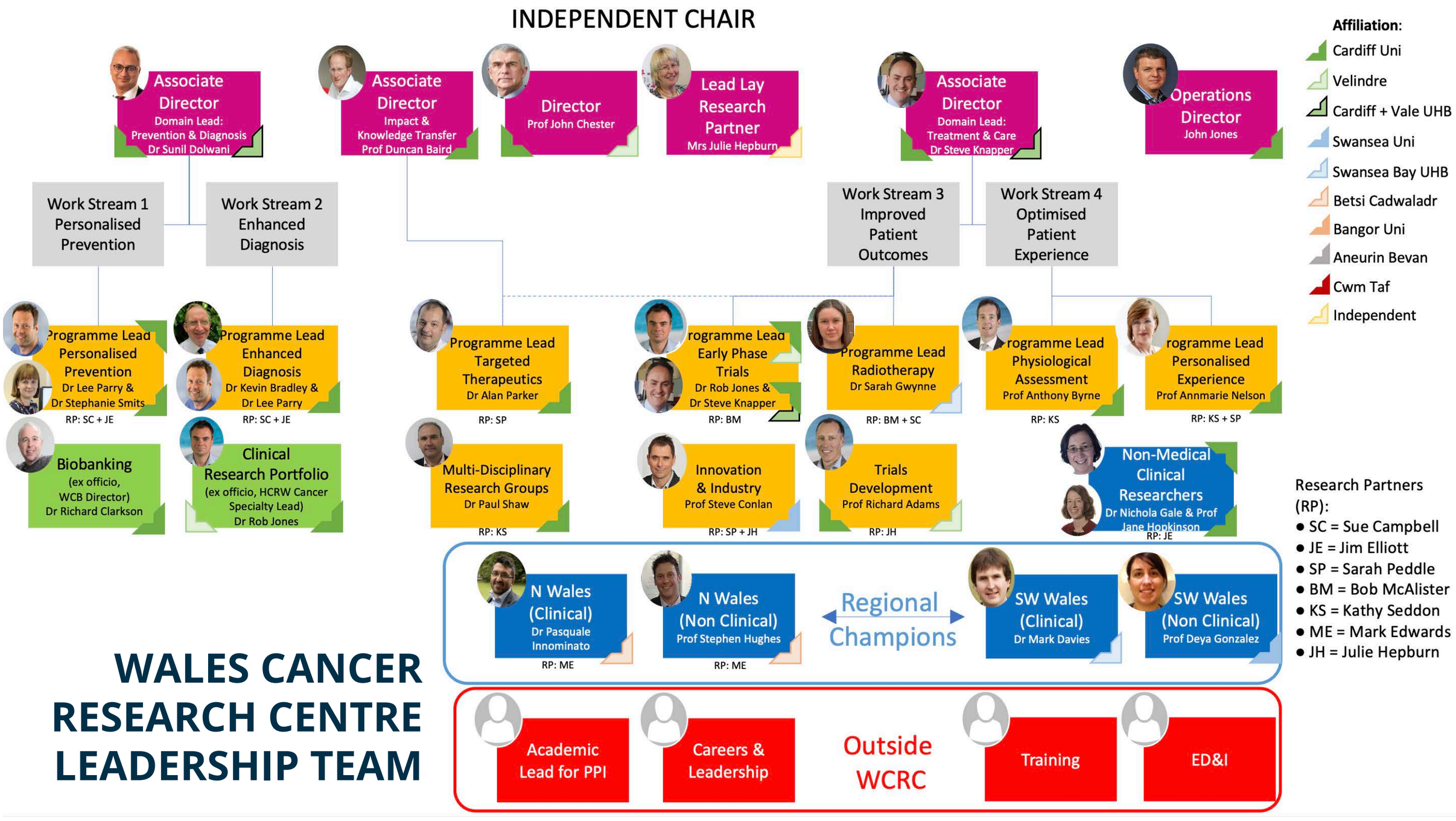
We are exploring difficult treatment decisions, assessing patient experience before and during treatments, and in the recovery phase. Patients who have opted not to undergo treatment will be an important comparator group.

**Integration of patient experience into clinical decision-making**

We will work with UK partners to classify subjective patient experience for use in clinical decision making. Our innovative 'decision support model' will be at the heart of a new concept in Multi-Disciplinary Team meetings – 'SMART MDTs'. These SMART MDTs will co-produce personalised treatment plans based upon data, including tumour characteristics, the patient's physiological resilience and individual values and preferences.



# OUR STRUCTURE




## WALES CANCER RESEARCH CENTRE LEADERSHIP TEAM

Research Partners (RP):

- SC = Sue Campbell
- JE = Jim Elliott
- SP = Sarah Peddle
- BM = Bob McAlister
- KS = Kathy Seddon
- ME = Mark Edwards
- JH = Julie Hepburn

# KEY ACHIEVEMENTS

## Cardiff scientists switch from cancer research to help develop coronavirus vaccine

Prof Alan Parker's team usually work on reprogramming viruses so they can target and kill cancer - but at the start of the pandemic, they switched their efforts to help in the fight against the new virus.

***Our researchers are highly adaptable and took up the challenge of combatting the pandemic***

Their work over the past seven years has centred on modified adenoviruses such as the common cold as viral vectors - or carriers - that can seek out and destroy cancer cells.

Over this time, Prof Parker and his team have a vast bank of different adenoviruses, and their work aimed to seek out - and recommission - the viruses with the potential to be used to deliver a vaccine for coronavirus.

They identified about half a dozen viral vectors which could be useful for encoding coronavirus antigens - the name for the part of the virus used to safely induce an immune response which may then offer protection against subsequent infection, or immunity.

"Our aim was to produce potential vaccines and then pass these on to immunologists to test to see if they are able to induce an immune response that can protect against coronavirus infection," said Prof Parker.

"As scientists, we're all wondering how we can usefully contribute. Everyone feels the same. Our role is just a small part of the huge effort that is under way to help fight this virus.

"Our expertise is in tinkering with viral vectors for therapeutic benefit. We've changed tack slightly - from fighting cancer to infectious disease - but we're still doing what we're good at and drawing on what we know."

Many of our researchers were redeployed at the start of 2020 to tackle the pandemic. We are proud of the efforts they have all made to tackle the virus and to continue with vital cancer research under challenging circumstances.



## Nearly half of people with potential cancer symptoms in first wave of pandemic did not contact GP, study finds

Nearly half of people who experienced possible cancer symptoms in the first wave of the COVID-19 pandemic did not contact their GP, the initial findings of a UK-wide survey have suggested.

The research was carried out by Cardiff University and Cancer Research UK, with preliminary findings focusing on the experiences of 7,543 people from March to August 2020. The study was funded by the Economic and Social Research Council. Our lay lead for public and patient involvement, Julie Hepburn, was a co-applicant on the study.

Possible cancer symptoms were commonly experienced during the first wave, the survey found, with 40.1% of participants (3,025 people) saying they had experienced at least one potential symptom.

Of those who experienced symptoms, a substantial proportion (44.8%) reported not contacting their GP for any symptom, even for red flags such as coughing up blood (30.7% of those who experienced this symptom did not seek help), an unexplained lump or swelling (41% did not seek help) or a change in the appearance of a mole (58.6% did not seek help).

A policy briefing paper on the findings calls for coordinated campaigns across the UK to highlight that NHS services are open safely for anyone with unusual or persistent symptoms.

Principal investigator Professor Kate Brain, a health psychologist from Cardiff University's School of Medicine, said people had "put their health concerns on hold to protect the NHS".

The policy briefing paper also outlines:

More than two-thirds of respondents reported feeling safe from COVID-19 if they needed to attend an appointment at their GP (68.2%) or hospital (61.2%) – but nearly three quarters (72.3%) were worried about delayed cancer tests and investigations due to COVID;
Worry about wasting healthcare professionals' time (15.4%), worry about putting extra strain on the NHS (12.6%), not wanting to be seen as someone who makes a fuss (12%), difficulty with access to healthcare services (10.3%) and worry about catching COVID-19 (9.6%) were reported as barriers to seeking medical help. In contrast, remote consulting was not a common barrier to medical help-seeking (4.8%).

Professor Brain said: "From the early data we collected after the first lockdown we can see that the COVID-19 pandemic has affected public attitudes to seeking help for signs and symptoms of cancer which may translate into delayed referrals, missed tests and later-stage diagnosis.

"This suggests the government's message to 'stay home, protect the NHS, save lives' which was intended to control the spread of COVID-19, also sent a strong message to the public that cancer can wait. While we recognise that measures to control the spread of COVID-19 are essential, we also need to send a strong and clear message that cancer cannot wait, that people should contact their GP with any unusual or persistent symptoms and that NHS services are open safely."

The report recommends that further work is needed to make it clear that NHS services are open safely.

It concludes that clear information is needed to encourage confidence in contacting the GP promptly, explaining the changes to GP practice procedures and what to expect at a consultation, and to alleviate worries about NHS capacity and infection control.

***Clear information is needed to encourage confidence in contacting GPs promptly to report cancer symptoms***

# Research Inspires Me (RIME) Schools Engagement Project

We teamed up with Cardiff University to launch a competition and education pack to mark World Cancer Day.

Developed with teachers, researchers and poets, this new education pack aims to inspire a future generation of cancer researchers while improving skills in literacy and digital competency. The RIME project (Research Inspires ME) features a quiz that educates about cancer risk factors, a tool to help children assess the validity of medical research claims they find online and a competition that challenges them to get creative and write a poem about cancer research.

***Our education pack aims to inspire a future generation of cancer researchers***

Bringing together the arts and sciences, this free resource is designed for use by English, Welsh, PSE and science teachers who work with key stage three pupils (age 11 - 14).

The project invites school pupils to write a poem about cancer research for a competition. To inspire them, poets Ifor ap Glyn (National Poet of Wales) and Owen Sheers, pictured above, have composed works of their own, based on conversations with some of the researchers tackling cancer in Wales. Their compositions have been transformed into two powerful film-poems that feature in the education pack. (See more on page 22.)

The poets will pick one winner in Welsh and one winner in English who will receive £150 each in book tokens for their school and have their poem displayed publicly at a cancer research facility.

Dr Kieran Foley, a consultant radiologist at the Royal Glamorgan Hospital and a clinical researcher for Velindre Cancer Centre and Cardiff University, is one of the researchers who helped to develop the project.

He said: "There's sometimes a tendency for people to picture a scientist in a lab coat when they think of cancer researchers. My role is much closer to patients. My research involves using radiology scans that patients have when they are diagnosed with cancer to improve the decisions about which treatments have the best chance of success and which types of scans should be used and when. I really enjoy working with a variety of people from different specialities and hospitals and seeing the research we do being used in everyday practice. It's wonderful to know that my work helps improve the lives of cancer patients and I hope this education pack will encourage young people to consider taking up a career in the field."

Over fifty schools have signed up to use the resources.

The films and education pack are available in Welsh and English and are free to download from our website. They have been produced in collaboration between Cardiff University, the Wales Cancer Research Centre and the Centre for Trials Research, with funding from the Wellcome Trust.

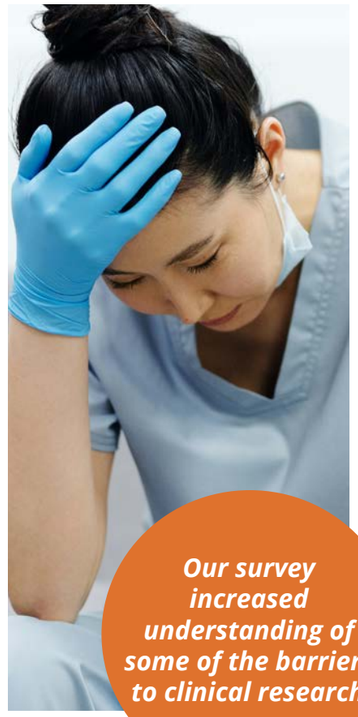


# What are the challenges to becoming a clinical research lead in cancer in the NHS in Wales?

Research is of key strategic importance in the NHS in Wales. The NHS Wales cancer clinical community has much to offer in improving the quality of care and wider outcomes for cancer patients in Wales and beyond, through clinical research. Cancer Research UK is keen that Clinical Trial Units build a portfolio of trials. Leadership, including supporting and developing Chief Investigators, is required to engage in the development and delivery of cancer clinical research. We undertook a short survey to try to understand barriers to the development of such leaders in NHS Wales.

The survey was developed by Professor Richard Adams from the Centre for Trials Research and Jodie Bond from the Wales Cancer Research Centre, in collaboration with Dr Sue Channon and Dr Philip Pallmann from the Research Design and Conduct Service, (RDCS-South East Wales).

The survey was completed by 80 practitioners, including oncologists, surgeons, nurses, physiotherapists, radiographers, psychologists and clinical scientists. The results of this survey show that there are barriers perceived and experienced at an individual and professional group level. While there is support available, through the RDCS and where needed through Clinical Trials Units in Wales, this needs better signposting, workloads need to be reviewed and time needs to be allocated within job plans for the development of this important work and to ensure succession planning for our future leaders. The survey has provided valuable information and areas for focus going forward and we are very grateful to all those who completed it. The survey results are available to download from our website.



***Our survey increased understanding of some of the barriers to clinical research***

# Meet our new Public Involvement Academic Lead, Alisha Newman

I was appointed as the Wales Cancer Research Centre's Academic Partner for Public Involvement in 2020.

My interest in the position stemmed from the desire to advance public involvement in research through application of my experience gained in past community education and development roles. This included eight years at CLIC Sargent, where I worked with children and young people with cancer and their families to implement an award-winning UK-wide service which supports their influence on decision-making, and is central to the charity's research, development and influencing work.

As Academic Partner, I am keen to build on the strong foundation that has been established through the centre's research partner model, and to harness the dedication and passion of the involved public who undertake this important role.

Together with support from the organisation's wider infrastructure, we aim to take involvement to the next level through delivery of the new five-year public involvement action plan. This means inspiring wider understanding, greater buy in, and growth of public involvement, to include a range of involvement opportunities that support greater diversity in line with the UK Standards for Public Involvement.

This work will be underpinned by a pragmatic approach and tangible public involvement impact cases which will be produced using our purpose-built tool. These examples will help researchers and the public to understand that through the achievement of our public involvement ambitions, we will attain the ultimate reward of better research.

# Wales Cancer Bank wins biobank of the year

One of our closest collaborators, the Wales Cancer Bank, was named as the 2020 UK Biobank of the Year by the UKCRC Tissue Directory and Coordination Centre at their annual Biobanking Showcase event on 16th October 2020.

The Wales Cancer Bank collects samples of tissue and blood from patients in Wales where cancer is a possible diagnosis. The samples are stored to form a biorepository to which researchers can apply for biosamples and data. Thousands of their samples have been used in research conducted across the world in order to improve treatments for cancer patients.

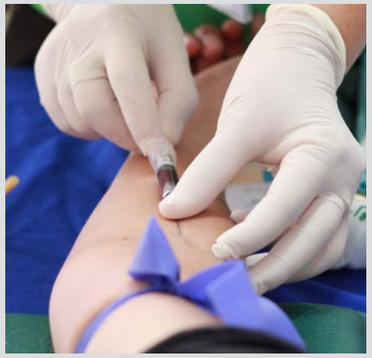
This year's showcase event was held virtually across five afternoons and included some innovative breakout sessions to stimulate remote conversation. Dr Alison Parry-Jones, the Operations Director for the Wales Cancer Bank, accepted the award certificate from Gary Rooksby who is a product specialist for award sponsor, Achiever Medical.

Dr Parry-Jones commented, 'The Wales Cancer Bank is proud to receive this award and thanks the sponsor, panel and the UKCRC TDCC. This is for the wonderful team we have - it has been a challenging year, not only because of COVID and lockdown but we were applying for continuation of funding and we had a large internal (routine) audit followed by an HTA inspection in January. The staff were magnificent, pitching in to help with activities not in their job description - we managed to audit 7,000 consents in three months in preparation for the audit and inspection. COVID and lockdown has given us challenges, as it has many other biobanks, but we are now back up and running and supplying samples again to researchers. Hopefully the next 12 months will be a little quieter!'

The awarding panel were particularly impressed with the application from the Wales Cancer Bank as it demonstrated a strong performance across many of the criteria for the award. In particular their agility in responding to the COVID-19 pandemic, despite being primarily a cancer biobank. They felt that this showed a proactive quality which underpins their service. They were also impressed with the biobank's patient and public involvement activities. The panel commended the biobank for the overall quality of their resource.

***Our congratulations go to the Wales Cancer Bank for winning biobank of the year***

# Early Detection & Diagnosis Stakeholder Event



Cancer Research UK recently launched their Early Detection and Diagnosis (ED&D) Roadmap. This marked a timely opportunity to gather strategically important partners to increase the mutual visibility of CRUK's ED&D strategy and relevant cancer research in Wales.

We held a virtual event on the 17th of March. The event introduced Cancer Research UK's ED&D Roadmap strategy and funding streams to researchers from across Wales.

A presentation led by CRUK's ED&D team was followed by introductions to some of our key partners and areas of research strength. The concluding question and answer session proved invaluable in identifying areas of strategic fit to drive research forward in this vitally important area.



# Predicting success of hormone therapy in breast cancer patients

A trial sponsored by Velindre University NHS Trust and led by Velindre Cancer Centre and Cardiff University has found a potential new way of predicting the outcome of breast cancer patients who are taking a drug called fulvestrant. The findings were presented at the prestigious international European Society of Medical Oncology conference (ESMO), which was held online this year.

Cancer researchers are always striving to improve the way treatments are delivered to patients. Fulvestrant, developed by AstraZeneca, has been a successful drug in the treatment of breast cancer, but this research has identified a biomarker which appears to pick out patients who gain most benefit from the drug.

Discoveries like this mean that, potentially, doctors can more accurately pick treatments that are more likely to work in an individual patient. This could not only save patients from undergoing unnecessary treatment, but it could also save the NHS money.

The trial, which was endorsed by Cancer Research UK, looked at patients with advanced Oestrogen Receptor positive breast cancer that has spread around the body, where hormone therapy is often the best treatment. There are many different ways in which breast cancer cells become resistant to hormone treatments, and one is thought to be the activation of a 'signalling' pathway in the cells involving a protein called RET. Studying the level of RET protein expression in patients on this trial led to this finding. The trial involved 165 patients from 19 different hospitals across the UK and the data was coordinated and analysed by the Centre for Trials Research at Cardiff University. All patients took fulvestrant, and the trial assessed whether adding a new drug called vandetanib could improve outcomes further. The research team found no evidence that patients receiving vandetanib gained additional benefit. However, the trial has shown that patients on fulvestrant treatment whose cancers have higher levels of the RET protein do much better. In fact, in this trial their cancer is controlled for over twice as long as those who have low RET levels and this is highly statistically significant.

Dr Rob Jones, who leads our early phase trial research, and Mark Beresford, of Bath University, co-led on the study. Dr Jones said, "This finding was actually quite a surprise as previous laboratory work has indicated activated RET can lead to resistance to hormone therapy. However, our data, which looked at cancer tissue samples from patients in the trial, clearly indicated that patients with high RET levels in their cancers received much greater benefits, which is likely to be as a result of fulvestrant treatment. I am delighted that we were invited to present these findings at ESMO. Velindre Cancer Centre, together with the Centre for Trials Research at Cardiff University, have been at the forefront of delivering new clinical trials for cancer patients and this is a real recognition of the value of the work we do here in Wales."

Mark added, "Only one in four cancer trials produce positive results, and although ours didn't show the results we were looking for, I'm delighted that these findings could go on to improve treatment for patients."

As this finding was largely unexpected it will be important to confirm this with further research, but it could lead to an additional tool in making informed treatment choices for breast cancer patients.

# Biosamples with trial data made available

A partnership between the Wales Cancer Bank and the Centre for Trials Research has presented a rare opportunity to access tissue and blood samples that come complete with associated trial data.

Samples from eight cancer trials are available. In January, we held an event for the research community, detailing more about how the data linked to these samples could benefit research projects.

Information about the samples and associated data can be found on our website.

# Industry update

Significant progress has been made in engaging with industry in the UK and internationally.

We currently have two Clinical Research Organisations (CROs) that are in negotiations with primary care and secondary care. A Letter of Attend has been signed by Cardiff & Vale UHB, Swansea Bay UHB and Betsi Cadwaladwr HB, in trying to increase commercial trials in a variety of formats.

There have been early stage collaborations set up with pharma companies such as Roche with the Experimental Cancer Medicine Centre (ECMC) programme. There are also a number of discussions going on with various other organisations and networks within the UK and internationally. Through the Welsh Government overseas offices, we have two companies wishing to engage with us; Canada in particular, within the areas of artificial intelligence and data integration and very early stage cancer detection. These discussions have already started with the Quebec Regional government on potential funding avenues. Pilot projects have been identified within the primary care setting to test the AI software.

Another collaboration has been established with Salamanca University and Cardiff, Bangor and Swansea Universities to explore working and collaborating on European grant applications. Further afield in China we have had a request to set up a joint collaboration with XJTU Suzhou Academy and the Wales Cancer Research Centre, exploring a list of patents ready for translational work into the Chinese market. Through the Welsh Government overseas and contacts within Cardiff University we are in negotiation with hospitals, pharma and biopharma companies within Henan Province, China.

We have been asked to sit on the advisory board for the new medi-park being built next to the Grange Hospital, Newport. We will be feeding industry partners in to the site and will be advising on potential collaborations.

The business innovation team within WCRC is involved in the setup of spin-out companies from Cardiff University and will be steering the progress throughout the project.


# Meet our new Director of Operations

It is with great pleasure that we introduce our new Director, of Operations, John Jones. John is a commercially-focused senior clinical operations manager with 20 years of experience in the private medical industry along with multiple management roles at a blue-chip retail company. His focus wll be to build our centre through improving our links with industry.

It is unlikely that John will be able to meet members of the research community in person for quite some time, so we asked him a few questions to give you an introduction..

**Why were you attracted to working for the Wales Cancer Research Centre?**
I have spent over 14 years working within the health care sector and wanted a role that offered an opportunity to make a real difference to the health of the people in Wales and beyond. While working as a manager of a clinical trials unit in Cardiff my research into the industry led me to discover how far Wales was lagging behind not just the rest of the UK, but internationally in health management. This role within the Wales Cancer Research Centre is ideally placed to make a real impact within the area of cancer.

**What are you enjoying most about the role so far and what do you hope to achieve?**
What I am most enjoying about the role is discovering how much talent there is working within this field and how many excellent opportunities there are to make a real difference. My goal is to make the centre a self-sustaining organisation that can bring together the talent within Wales and work not only on a national level but internationally. I want to help make Wales one of the top places in the UK to work within the field of cancer.

**How do you relax after a busy day in the home office?**
I have a wide variety of interests. I have a passion for cooking and have a veg and herb garden that feeds into my enjoyment of cooking and gardening. I practice yoga to stay fit and enjoy reading non-fiction and history.

**What kind of challenges have you faced in starting this new role during lockdown?**
All my interactions have been virtual rather than face-to-face so engaging in personal interactions that help develop relationships has been the biggest challenge.

**What are you most proud of in your career to date?**
I am most proud of transforming a small 500 sq. ft. clinical trials unit with three tiny clinic rooms, tucked away within an upper floor of a business unit in a business park into the one of the biggest private trials units in the UK. I moved and developed the tiny unit into a two storey 10,000 sq.ft. state of the art, modern purpose built unit with eight large clinic rooms and laboratory just under Castle Coch for Synexus. It was successfully opened to great fanfare with executives flying in from all over the world and TV and radio coverage

# Scientists develop rapid test for diagnosis of rare set of genetic conditions

Researchers at Cardiff University and Queen Mary University of London have developed a rapid test for the diagnosis of a constellation of rare and debilitating genetic conditions.

Telomeropathies are caused by premature shortening of the tips of chromosomes, the DNA molecules which contain our genetic information.

They can result in a range of symptoms, including bone marrow failure, pulmonary fibrosis, cancer and liver disease in adults and children. There are currently about 1,000 people living with telomeropathies in the UK, many of which are undetected.

Now, our researchers have developed a rapid laboratory test for diagnosing patients showing the many different types of symptoms that can arise from telomeropathies.

***Telomeropathies can result in a range of symptoms, including cancer.***

The technique, called high-throughput single telomere length analysis (HT-STELA), is a DNA-based blood test that provides high-resolution information. The researchers say it can be applied to a broader range of samples than existing tests, including fresh or frozen blood samples.

The research was led by Professor Duncan Baird at Cardiff University and Professor Tom Vulliamy at Queen Mary University of London and is published in the journal Human Genetics.

Professor Baird, one of our Associate Directors, said: "If a patient presents with a severe symptom such as bone marrow failure we can now test, more accurately and rapidly than ever before, if this is the result of a telomeropathy, thereby speeding up the process of providing a diagnosis for these patients.

"We believe the speed and accuracy of this technology will provide a step-change in the clinical utility of telomere testing."

Telomeres are structures that protect the ends of chromosomes and they shorten with advancing age. When they become too short, cells are no longer able to divide, and scientists believe this may underlie the natural ageing process in humans.

In telomeropathies, they shorten too early because of defects in their maintenance caused by mutations in specific genes.

Dyskeratosis Congenita (DC) is a telomeropathy that affects many parts of the body, including abnormalities in the skin, fingernails and toenails and mouth, in both adults and children.

To test the efficacy of the new tool, the researchers used it to compare telomere length in 171 healthy individuals with 172 patients who had diagnoses for DC and other related disorders.

They found the group with these diagnoses, particularly the younger patients, displayed shorter telomere length.

HT-STELA also allowed the researchers to identify a smaller group of patients where telomeres, shorter than that expected by age, caused a five-fold greater risk of death.

"We believe this is the first time that the extent of telomere shortening has been shown to have such a significant impact on life expectancy," said Professor Baird.

The test is provided by the Cardiff University spin-out company TeloNostiX that has set up the technology in a clinical testing laboratory. The work was funded by the Medical Research Council, the Wales Cancer Research Centre, Cancer Research UK and the Welsh Clinical Academic Training (WCAT) programme.



# Placing patients at the centre of the decision making process in advanced lung cancer

***Treatment outcomes should be measured on the basis of what the patient has defined as important rather than on tumour size alone.***

In the Marie Curie Palliative Care Research Group's PACT study, researchers followed the journey of patients with advanced lung cancer as they navigated through the process of deciding whether non curative chemotherapy would benefit them or not. Despite the best intentions, chemotherapy may have serious complications in those with advanced disease, increasing the risk of early death, unpleasant side effects and worsening quality of life. Careful planning and discussion is needed in order to make an individualised approach to treatment.

The study's Chief Investigator, Professor Annmarie Nelson, who leads our personalised experience research explained "I was struck by the statistic that 10% of patients with advanced lung cancer die within 30 days of commencing or whilst on chemotherapy. It seemed important to me that we take a careful look at how we decide whether chemotherapy is in a person's best interests or not when their prognosis is limited to months."

The researchers observed how decisions were made within a multidisciplinary team of lung cancer specialists and how these decisions were subsequently discussed with patients. Patients were interviewed to explore their experiences of the decision making process and how helpful they found the consultation. Perspectives were also sought from family members, healthcare professionals and expert stakeholders, comprising a total of 99 interviews.

The study found that initial treatment recommendations didn't always take account of patient's personal life priorities and social circumstances in the context of a terminal illness, and the impact that chemotherapy might have. The focus of discussions was often on the cancer and not the person, something which appeared driven by a pressure to initiate treatment plans within set timeline targets. Both doctors and patients often struggled with discussions around the life-limiting nature of their condition where prognosis was often measured in months. This prevented open conversations about alternatives to chemotherapy such as focusing on supporting wellbeing, participation in family life and early access to high quality palliative care.

Dr Jason Lester, Lung Cancer Oncologist and member of the research team said "At a time when cancer treatment decisions are increasingly based on tumour genetics and immunological profiles, the risk is that in the context of advanced lung cancer the patient's own voice and needs are overlooked which might result in avoidable harm."

Professor Nelson added "Early palliative and supportive care should be more openly explored alongside, or as an alternative to palliative chemotherapy, and the outcome of any treatment measured on the basis of what the patient has defined as important rather than on tumour size alone. In this way the benefits of any treatment will better reflect the impact on lived experience and quality of life, helping lung cancer patients and their families make more informed choices about their care."

The PACT study raises several opportunities to improve how lung cancer teams can place patients at the centre of the decision making process. The Research Centre is already developing a tool for supporting teams in this, as well as reviewing the current methods used for evaluating a patient's fitness for chemotherapy.

The PACT study was funded by the Stepping Stones Lung Cancer Research Fund at Velindre Cancer Centre. The publication can be found here: Chemotherapy decision-making in advanced lung cancer: a prospective qualitative study.

# Spotlight on: our public & patient involvement group

Our public and patient involvement group are central to everything we do. They work with our researchers to ensure that the work we do is relevant and valuable. We would not be the organisation we are without them.


**Alisha Newman**
**Academic Lead**


**Julie Hepburn**
**Lay Lead**


**Mark Edwards**
**Research Partner**


**Sue Campbell**
**Research Partner**


**Bob McAlister**
**Research Partner**


**Jim Elliot**
**Research Partner**


**Sarah Peddle**
**Research Partner**


**Kathy Seddon**
**Research Partner**


**Kate Cleary**
**Project Officer**

# Velindre Futures

**Research partner Bob McAlister tells us about his work with Velindre Cancer Centre.**

As a Wales Cancer Research Centre Research Partner in this strangest of past years, I was fortunate to get a substantial involvement opportunity at Velindre Hospital. That Health Trust have a pivotal 10 year strategy called 'Velindre Futures' which involves a new core hospital and service redesign. As part of this significant change, cancer related research is also being prioritised. In brief, there is recognition that research active environments have better patient outcomes and tend to retain staff who are leaders in their field of study and specialist treatment.

I was one of two public representatives on the research task and finish group. The other was a male who had been part of clinical trials whilst receiving treatment at the hospital. Thus he spoke passionately of his first hand experiences. The group chair was Professor Mererid Evans, a noted clinician and researcher. Other group members were drawn from current research pockets across Velindre and from partner bodies such as Cardiff University. Importantly, the Velindre Board were also represented. Both of us public members were very well supported and listened to on the group.

So what did I 'bring to the (working) party?' I have a lot of experience of such groups and their dynamics. In this case I could tell that the clinical researchers were very engaged. It was clear that most group members felt carving out properly funded and protected research time and building critical mass across the workforce is key.

Thus it was important that current barriers were openly identified and costed solutions outlined in any strategy. I helped to keep focus on the achievement pathways. A number of times I sent additional thoughts to the Chair in between meetings and had extra catch ups. This is some of the feedback that I received from a group member: *I have to say that your contributions at the Velindre Futures meetings are very important. You manage to get the group to focus attention on the "path to getting things done" and you put it on the table that simply having a strategy isn't enough. It's the classic case of people listening to the objective bystander.*

I did not write the very impressive eventual strategy, I could not speak with the passion and experience of the other public member, but I know that some of my input was important and well received. Also both of us wrote supportive narratives which were recorded and used to start every Velindre webinar when the completed strategy was introduced to the staff. Overall, this was a very rewarding example of public involvement.



# A year in the life of our public and patient involvement group

**Julie Hepburn, our lay lead for patient and public involvement, shares her thoughts on the past year.**

The new funding year started in April 2020 with several challenges for our public involvement advisory group to overcome before we could focus on our plans for the future. COVID 19 was the most significant challenge, necessitating new ways of working and requiring us all to become more proficient at distanced working and the associated use of online platforms. Vacancies existed at the start of the year for both the group project officer and the academic partner, which temporarily delayed progress. Fortunately, these roles were filled quite quickly, which enabled us move forward with our plans. Alisha Newman, our new academic partner, has written an introductory article on page 13.

Requests from the research community for our help and advice slowed at the start of the year as many researchers were reallocated to clinical work because of the pandemic. We took this opportunity to push forward with some of the pre-existing plans outlined last April, and to re-examine the research partner role and our aims for the future.

Areas we have made progress on this year are:

- Aligning research partners to work with the new structure. All areas of the WCRC organogram now have a linked research partner to work with and discuss ideas and requests (see pages 8 - 9).
- Appointment of a research partner in north Wales. Mark Edwards was appointed in September. His presence has been welcomed by researchers in the area.
- Public involvement in research action plan: a new five year action plan has been produced and working groups are being established to deliver it. Some key actions on impact, diversity and inclusion have already been advanced.
- Diversity and inclusion. Key actions within the public involvement action plan aim to find ways of capturing opinions/ suggestions from beyond our immediate research partner group. This includes working with the Cardiff University School of Medicine engagement and involvement group to pilot use of an online social network to attract a broad cross section of society to whom we can promote the growing number of research and teaching involvement opportunities.
- Rapid Response Group. A new group of 10 members of the public with experience of cancer was appointed in March 2021. Currently being piloted with support from Health and Care Research Wales, the group's function is to respond quickly to researchers wanting public involvement help with funding bids when deadlines are imminent.
- Development of a tool for recording and reporting public contributors' impact on research against the UK standards for public involvement. The tool is being finalised and will be piloted in five research projects before final release to the wider research community later this year. Progress in the area of impact capture and reporting would be groundbreaking and of significance beyond the centre.

Our new action plan outlines future areas for development and, with the support of the research community in delivering it, the next four years should prove to be an exciting and productive time for our public involvement work.

# The Song of Us

**Composed by author, playwright and poet Owen Sheers, based on conversations with our researchers (see more on page 12).**

And so what makes us breaks us -
a scratch in the genetic record,
the cell's needle catching on its error
to knit an echoed note of darkness
link by link, into the fabric
of the body's living brightness.

The twitching tick of a molecular clock, stuck.
A fledgling, nesting its repeating song
in the tissue of a lung, a breast, under the skin.
An embryo of ending, inherited or acquired,
and growing now too, on a diet
of its own broken chant of Begin, begin, begin.

Which is where we come in.
Because what breaks us, makes us -
the lookers, the thinkers, the intimate readers
of the body's script written under the skin.
The travellers down paths of trial and error,
often alone - in a lab, a room, in bed at home -

and yet always together
bonded as we are by the ideas that we grow,
that flow between us through capillaries of thought
across borders, ages, religions,
coursing with the songs of our inspirations,
the ideas which in their movement, multiply.

Millions of small steps becoming strides,
leaps, the stories and records
of what we've seen, noted and known.
A global organ of knowledge, inherited or acquired;
an arsenal of thought and hope combined
that when applied can unravel that knitted shadow

and make time grow again.
Because knowing that what makes us,
makes us, this is also what we do -
under the microscope's bright eye,
through the long hours of silent thinking,
in the deciphering of code and gene,

in the enquiries at the needle's curious point -
Make time, and once more set it free
through the lives of people like you and me.
Time for love to breathe, to see.
For a mother to watch her children play
or for children to know their father

tomorrow as well as today.
To take the lives unlived that we might glimpse
in the image on a screen,
and make that image sing a different tune,
a new thought-created song
that knits hope from failure,

and that puts it on the record
that by working together
we can begin, begin, begin
to imagine a different future
and make that future happen.

# Nurse & allied health professional meeting

The third annual nurse and AHP conference was hosted online this year. It benefited from a geographically diverse attendance which has previously proved to be an issue for in-person events.

Prof. Mary Wells (Lead Nurse for Research at Imperial College Healthcare NHS Trust and a Professor of Practice in Cancer Nursing at Imperial College) joined as our keynote speaker for the conference.

Other sessions included updates from regional representatives, the Research Design Service and a group discussion around building research capacity.


# Putting patient need at the heart of brain cancer trials

Researchers at Cardiff University have been awarded £155,000 from the Brain Tumour Charity to develop a standardised way of recording patient-reported outcomes for brain tumour trials.

Brain cancer studies traditionally focus on tumour size and maintaining patient survival. But there is growing recognition that studies need to better consider information about outcomes such as quality of life. This is particularly relevant in brain cancers like high-grade glioma, where survival benefits are modest.

Quality of life naturally means something different to every patient. Some patients might want to prioritise quantity of life over quality – perhaps they have a grandchild on the way or want to make it to a family wedding. Others may prefer to prioritise their fitness over survival length to enable them to lead a more active life.

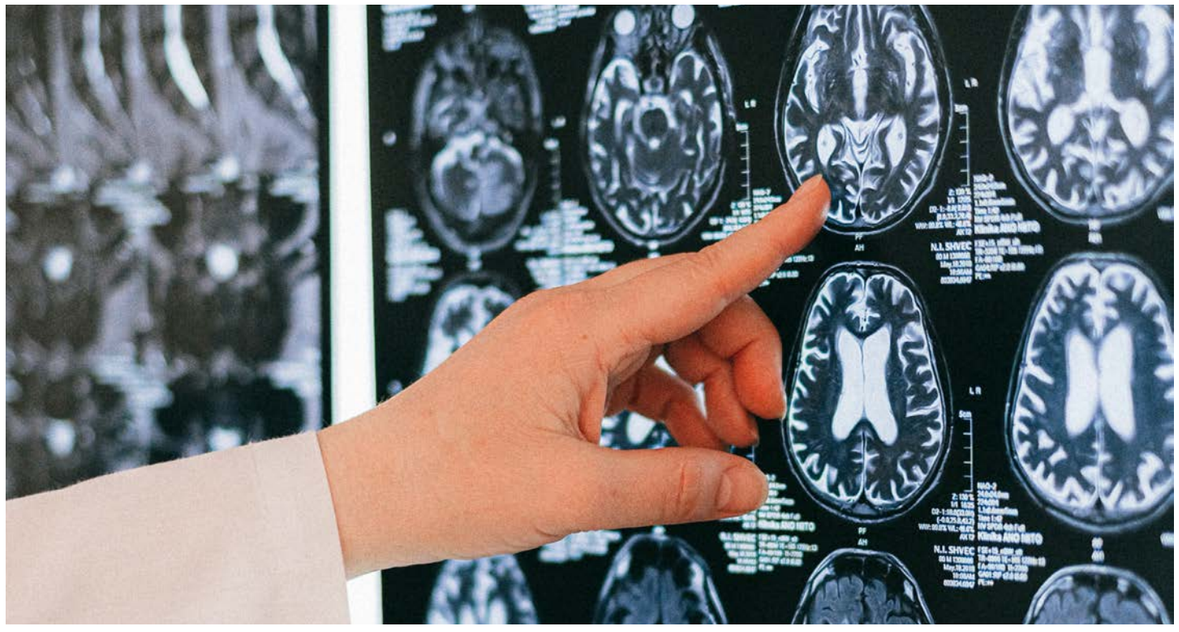
Many brain tumour trials gather information about patients' quality of life, but the vast majority either never report it, or do not assess its importance alongside tumour response. There is also no standardised way of measuring quality of life, which makes comparing studies to find the best ways of assessing patients very difficult. To remedy this, Prof Anthony Byrne and his team at Cardiff University will seek consensus amongst patients, families and researchers about essential areas of patient/family experience to be collected across every glioma trial. The consensus will produce a patient-oriented Core Outcome Set (COS) to be applied across all UK studies. COS development in other conditions has improved the quality and consistency of information captured, which enables better data sharing to improve the way we routinely treat patients.

Prof Anthony Byrne, Chief Investigator for this study, said, "This project will produce a high quality, consistent approach to measuring patient and family outcomes in glioma studies. It will ensure that future trial results reflect impacts of treatment on lived experience and quality of life, helping brain cancer patients and their families make informed choices about their care.

"The project has also established strong links with another trial (the Tessa Jowell BRAIN MATRIX trial) that is specifically designed to support clinicians with decision making based on a patient's unique situation. Working together means our patient data can be evaluated in the context of a broad spectrum of patients with different types of brain cancer."

The study will run for 20 months and the results are hoped to improve the way glioma patients are treated in the NHS and beyond.

The project is a collaboration between the Marie Curie Research Centre, the Wales Cancer Research Centre and the Centre for Patient reported Outcomes at Birmingham University as well as cross collaboration between Cardiff University Centre for Trials Research and Birmingham Trials Unit.



# LOOKING FORWARD

With the worst of the coronavirus pandemic hopefully now behind us, the Wales Cancer Research Centre will be working harder than ever to build on the many successes of our first six years.

An immediate goal will be to fully embed our increased strategic emphasis on prevention and early diagnosis, patient outcomes and experience. The realisation of our ambitions in each of these important areas will improve our profile, in the UK and internationally, thereby encouraging further investment and new collaborations. This will also help us to provide top-class research training and to attract top researchers from outside Wales, generating a diverse, outward-looking and forward-thinking leadership team.

A key factor in our on-going success will be the new all-Wales cancer research strategy. Many members of the cancer research community, within the centre and beyond, have contributed to the evolution of this important, unifying document. Although inevitably delayed by the pandemic, I am encouraged that Health and Care Research Wales have committed to ensuring its imminent completion. It will be a blue-print for success and a clear illustration - within our community and to our funding partners - of a unique Welsh contribution to the global effort against cancer.

In the post-COVID, post-Brexit research funding environment, it will be more important than ever to ensure sustainability of cancer research in Wales – in both financial and human resource areas . It will be vital – literally – to secure long-term funding from a variety of public, commercial and charity funders. In addition, we must develop and attract the very best of the next generation of leaders in cancer research to drive our research forwards and ensure a vibrant future research culture in Wales.

Writing this forward look has been poignant for me, as it will be my last before handing on the role of Director. It's therefore important that I take this opportunity to thank the many colleagues and friends who have made it both a privilege and a pleasure to be the founding Director of WCRC. I'm proud to have been a part of an immense WCRC team effort, and I feel privileged to have worked with so many talented cancer researchers and dedicated patient and public representatives, from across Wales. The centre's success to date is due to the hard work and determination of a large team which is much greater than the sum of its parts. I will be forever grateful to everyone who has been involved, in so many different ways.

I fervently believe that we have built a strong platform for the future, based upon collaborative leadership and an inclusive team spirit, and that this will serve us well in achieving our ultimate ambition of reducing the burden of cancer for patients, their families and carers, and our community, in Wales and beyond.

**- Prof John Chester, Director**

**www.walescancerresearchcentre.com**
**02921 848970**

Prifysgol Bangor University

Prifysgol Abertawe Swansea University

Cardiff University / Prifysgol Caerdydd

GIG CYMRU NHS WALES — Bwrdd Iechyd Prifysgol Aneurin Bevan University Health Board

GIG CYMRU NHS WALES — Bwrdd Iechyd Prifysgol Abertawe Bro Morgannwg University Health Board

GIG CYMRU NHS WALES — Bwrdd Iechyd Prifysgol Caerdydd a'r Fro Cardiff and Vale University Health Board

Canolfan Ganser Felindre Velindre Cancer Centre