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Advice on the proposed model for non-surgical tertiary oncology services in South East Wales

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Contents

	Key points	2
	List of abbreviations	6
1	Introduction	7
2	Background	12
3	What do patients value?	22
4	Looking forward – the cancer system in South East Wales	24
5	Building research excellence	36
6	Cancer planning in South East Wales	43
7	Conclusions	44
	Appendix 1: The potential for co-located services	47
	Appendix 2: Requirements of the acute oncology model agreed by the CCLG in October 2020	53

Key points

Need for action

- Action is needed to improve cancer services across South East Wales: a high proportion of accommodation at the existing Velindre Cancer Centre (VCC) is non-compliant with statutory requirements and creates challenges in maintaining high levels of patient safety and experience.
- Furthermore, the existing centre does not have the future-proofing needed to deal with a growing cancer population with increasingly complex health needs.
- Solutions to the immediate issues facing cancer services across the region, and at VCC in particular, are required now, rather than at an indeterminate point in the future.

Co-location, the new VCC and future strategic opportunities

- Our experts and a number of interviewees pointed out the trend for single specialty hospitals, and other focussed institutions such as cancer hospitals, to be co-located on acute sites, often at a teaching hospital.
- We explored the potential for creating VCC at University Hospital Wales (UHW) but we have concluded that full co-location will not be an option for some considerable time.
- Importantly, there are future strategic development opportunities provided by the development of a flexible new VCC and proposed developments in Cardiff and the wider region. Working together over a 15- or 20-year window, the health system should look to exploit these development opportunities.

- Therefore, a flexible design for the new building will be required to accommodate these opportunities and future developments such as new haemato-oncology, endoscopy and other diagnostics capacity. The design should also ensure that the full potential of digital technology is exploited.
- Given this and the urgent need at Velindre, the proposed solution of a network model supported by a cancer centre focussed on high-volume ambulatory care represents a reasonable way forward. With a number of service changes detailed below, this can offer a safe and high-quality service that provides a good patient experience.

Inpatient care

- The VCC model should not admit patients to VCC who are at risk of major escalation. Changes in the admission criteria and overnight cover are currently being developed. Admissions and transfers to acute care should be kept under regular review and refined. This may reduce the requirement for inpatient beds but would create other opportunities for VCC to offer ambulatory care and diagnostic services.
- Each local health board (LHB) needs to develop a plan for oncology support for unscheduled cancer patient admissions and acute oncology assessment of known cancer patients, with inpatient admission as an option. This approach will mitigate the risks for inpatients across the network.
- Alongside UHW provision of acute oncology care, an enhanced research hub should also be developed as part of the research network model. This will allow many of the benefits of a co-located model to be achieved.
- The pathways to support inter-specialty referral need to be improved across all sites. This needs to include interventional radiology which will need to be expanded over time.

Ambulatory care

- While a lot of focus has been on the risks of inpatient care, the majority of patients using VCC are outpatients and day cases and they greatly value the environment and culture of Velindre and convenience in terms of travel and parking.
- The satellite radiotherapy and proposals to further develop a more rational distribution of ambulatory care across the region is a sensible direction of travel that will improve equity of provision and access.
- Ambulatory care at VCC should be expanded to include systemic anti-cancer therapy and other ambulatory services for haemato-oncology patients and more multidisciplinary joint clinics. Consideration should be given to expanding a range of other diagnostic services, including endoscopy at the new VCC.

Building the network

- The network solution being developed offers a number of benefits, including care provided closer to home for patients, a much better environment for patients cared for at Velindre, improved oncology support for emergency care in the district general hospitals, more opportunities for multidisciplinary research, and greater equity and coordination of care across the system.
- The development of acute oncology services in each LHB is a priority and will help support reductions in acute admissions across the network. A common dataset is required to support the planning of these services.
- Each LHB needs to ensure that there is a plan for providing oncology advice and support for patients admitted via A&E, and for acute oncology assessment of known cancer patients presenting with symptoms/toxicities, with inpatient admission provided as an option on a district general hospital site if needed. The assessment service model should provide for multi-disciplinary input, in particular from palliative care, specialist nursing and allied health professionals.

- The Velindre@ model should complement acute oncology services in the LHBs and should aim to bring solid tumour and haemato-oncology ambulatory services together. Further work is required to describe capacity and operational requirements, the interface with acute services, and the wider pattern of ambulatory care.
- Developing and operating a network is not easy and there are workforce and organisational development implications that require urgent attention. This should include the development of a workforce strategy.

Research

- The acute unit recommended for UHW should also form a hub for research activity and include collaboration with haemato-oncology research as part of the networked model.
- Finalising the refreshed research strategy supplemented by external peer review is a priority, and further work is required to fully take advantage of the networked model.
- The importance of multidisciplinary research and ensuring the involvement of all locations will be very important.

Planning

- There are significant opportunities from planning all cancer services in a more integrated way rather than the silos that currently exist. The planning approach for cancer services in South East Wales needs to be reviewed and improved. In particular, the coordination of strategy, the use of a common dataset and the leadership of the process all need to be strengthened.

List of abbreviations

AOS	Acute oncology service
CaNISC	Cancer Network Information System Cymru
CAR-T	Chimeric antigen receptor T-cell
CCLG	Collaborative Cancer Leadership Group
CT	Computed tomography
CUP MDT	Cancer of unknown primary multidisciplinary team
EMRTS	Emergency Medical Retrieval and Transfer Service
GMC	General Medical Council
LHB	Local health board
MRI	Magnetic resonance imaging
PET-CT	Positron emission tomography – computed tomography
R&D	Research & Development
SACT	Systemic anti-cancer therapy
SHO	Senior house officer
SVCO	Superior vena cava obstruction
UHW	University Hospital of Wales
VCC	Velindre Cancer Centre
WAST	Welsh Ambulance Services NHS Trust

1 Introduction

Velindre University NHS Trust is a specialist provider of cancer services in South East Wales and runs the Velindre Cancer Centre. It commissioned this report, asking us to provide an independent advice on the integrated regionally networked model including analysis and assessment of the benefits and risks of the proposed model of networked cancer care in South East Wales. Our terms of reference were to provide a report and recommendations taking account of the following questions:

- What are the benefits of the proposed integrated network model and how could these benefits be further optimised with reference to research from other health systems?
- What are the risks inherent in the proposed integrated network model – including the location of the main elective specialist cancer centre, the new Velindre Cancer Centre (VCC), on an area in Whitchurch in Cardiff known as the ‘Northern Meadows’ – in terms of managing the acute care interfaces and the quality and acuity of clinical support for cancer services across all networked sites?
- Are the strategies proposed to manage these risks satisfactory?
- What else might be considered? For example:
 - Are there any additional opportunities to strengthen planned arrangements?
 - Should any specific areas of planned work be prioritised or accelerated?
 - Are there any broader development opportunities related to cancer-related health care?

We have examined a number of related questions about the benefits of the proposed integrated network model with regard to research, development and innovation and whether the future planned arrangements are likely to fully optimise the opportunities and mitigate any associated risks.

Methodology

To undertake our assessment, we carried out the following:

- We spoke to nine patients identified by the Trust, the Cardiff Community Health Council and one individual from a campaign group who approached us.
- We interviewed 28 clinicians and managers from the Trust, local health boards (LHBs) and other organisations about the network model, key risks, mitigation strategies, the steps required to maximise the benefits of the model and the VCC's approach to research, development and innovation, and medical education and training. We also asked the LHBs about their views on the current operation of the cancer network, the future proposals and their local strategy for cancer care. We advised the Trust and LHBs of the types of clinical leadership roles that we wanted to interview and the Trust and LHBs then arranged these interviews with the appropriate role holders. We also interviewed two clinicians who approached us directly. A list of interviewees is available on our website.
- We held open access sessions for VCC staff and 49 clinicians, clinical managers and other staff signed up to these.
- We received papers from a number of internal working groups, submissions from people we were not able to interview, personal testimonies from staff, patients, carers and relatives of patients and public letters sent by staff who had concerns. All of these were taken into account.
- We commissioned analysis of data on cancer patients treated at all the hospitals in South East Wales and travel-time analysis.
- We applied lessons from our research into the provision of advice and guidance remotely, the features of effective networks and the operation of hospital groups.
- We analysed the pattern of urgent transfers from the VCC to other hospitals and any risks associated with these. We looked at analysis of untoward incidents, medical staffing arrangements and the views of trainee doctors in relation to these.

We then presented our assessment to independent experts in cancer and the management of cancer services to test our conclusions. These experts were:

- Professor Sir Mike Richards, previously Chief Inspector of Hospitals at the Care Quality Commission and National Clinical Director for Cancer for England
- Professor Chris Harrison, Deputy Chief Executive Officer and Medical Director (Strategy), The Christie NHS Foundation Trust and former National Clinical Director for Cancer for England
- Professor David Cameron, Professor of Oncology and Director of Cancer Services, NHS Lothian at the University of Edinburgh
- Dr Tom Roques, Consultant Clinical Oncologist, Norfolk & Norwich University Hospital, and Medical Director Professional Practice for Clinical Oncology, Royal College of Radiologists
- Ms Liz Bishop, Chief Executive, The Clatterbridge Cancer Centre NHS Foundation Trust and Senior Responsible Officer for the Cheshire & Merseyside Cancer Alliance
- Dr Matt Makin, Medical Director of The Pennine Acute Hospitals NHS Trust and of Supportive Care, a palliative care organisation.

We also interviewed medical directors at two other major cancer hospitals:

- Dr Majid Kazmi, Chief of Cancer Services and deputy Medical Director Guy's and St Thomas' NHS Foundation Trust
- Dr Sheena Khanduri, Medical Director, The Clatterbridge Cancer Centre NHS Foundation Trust.

We also held discussions with the NHS East of England specialised commissioning leads working on the future of Mount Vernon Hospital in Northwood, Middlesex, whose independent report we also reviewed. Clinical advice and internal peer review was provided by Nuffield Trust Senior Clinical Fellow Dr Louella Vaughan.

The independence of our assessment

A number of people have expressed concern about whether our sources of information mean that we have not been able to provide an independent assessment of the proposed regionally integrated network model of cancer care. There are three points to make here.

First, this is not and has never claimed to be a *wholesale* independent review of the project. The scope of this report is tightly defined and relates specifically to the clinical management of the planned network model for non-surgical tertiary cancer services and new cancer centre. For this reason, we have had to consult staff at the Velindre University NHS Trust and LHBs. The report does not seek to offer a view on other important issues such as environmental concerns, impact on inequalities or financial or cost considerations.

Second, we have used activity and other data, published research on service models and our external experts to provide perspectives on the issues independent of views within South East Wales. This has enabled us to understand and interpret the varying perspectives we have heard.

Third, we have sought input from people with a diverse range of views and perspectives within the South East Wales cancer system and also held two open access sessions for VCC staff who wanted to speak to us. A number of those who we interviewed and who attended the open access sessions have followed up those conversations with written personal statements.

We have also spoken to the chairs of Velindre Futures Groups who were very careful to ensure that they reflected the full range of views they had been given. The site-specific teams within the Trust also gave their opinions. From the divergence of these opinions, it was clear that we were hearing a wide range of views. We also received a number of evidence submissions from individuals by email, some of which contained major concerns about aspects of the proposals.

In this report we are providing a commentary on the issues that people have raised, our assessment of what we heard and our suggestions for approaches to deal with the risks we have identified.

It is very important to stress that this advice is being given on the proposed model and is not an option appraisal of all the different permutations for siting or distributing services across South East Wales. This also means that we are not making any judgement about the decision to site the new VCC on the Northern Meadows. Such a large-scale option appraisal exercise is not only well beyond our terms of reference but is fundamentally about values and the choices that need to be assessed and taken by all involved. It cannot be outsourced.

However, our expert panel and a number of interviewees raised the question about the desirability of a *co-located* model in which all VCC services would be moved to be next to University Hospital of Wales (UHW). In Appendix 1, we look at this question and our analysis is that this will not be an option for some considerable time, but may be possible as part of a redeveloped University Hospital of Wales (UHW) in the longer term. We also found that there are future strategic opportunities created by the development of a new Velindre Cancer Centre and the proposed UHW2 that the health system should look to exploit. With careful design investing in a high capacity ambulatory treatment centre is a sensible strategy in a number of different scenarios.

2 Background

Context

There is clearly a strong case for change in cancer services in Wales: cancer incidence rates continue to increase year on year, particularly among older people, who often present with significant comorbidities; and cancer is one of the main causes of death.

Treatment options continue to improve and big steps have been made in terms of earlier cancer diagnosis and survival, but this means that the number of patients living with cancer is increasing (as noted above), often with new long-term problems as a result of treatment. The new and novel treatments now becoming available have also changed the goal of many therapies from ‘cure’ to ‘progression-free survival’, making cancer a long-term, chronic condition, something to be managed rather than eliminated. This will have a significant impact on the assumptions underpinning cancer care and the delivery of it, as well as on health and social care systems.

Cancer outcomes in the UK¹ are behind those in other developed countries² and South East Wales has some of the worst in the UK and Europe for one-, five- and ten-year survival across all cancer types.³ The general health status and significant deprivation of a number of communities in South East Wales have a negative impact on the effectiveness of prevention measures, the

- 1 Lynch C (2019) ‘Measuring up: how does the UK compare internationally on cancer survival?’. <https://scienceblog.cancerresearchuk.org/2019/09/11/measuring-up-how-does-the-uk-compare-internationally-on-cancer-survival>. Accessed 19 November 2020.
- 2 Organisation for Economic Co-operation and Development (2019) *Health at a Glance 2019: OECD indicators*. OECD. www.oecd.org/health/health-systems/health-at-a-glance-19991312.htm. Accessed 19 November 2020.
- 3 Public Health Wales (2019) ‘Cancer survival in Wales, 1995-2016’. <https://phw.nhs.wales/services-and-teams/welsh-cancer-intelligence-and-surveillance-unit-wcisu/cancer-survival-in-wales-1995-2016>

uptake of screening, early presentation with symptoms, access to treatment and so on.

Velindre Cancer Centre

The Velindre Cancer Centre (VCC) is responsible for the delivery of non-surgical cancer treatment for the 1.6 million people who live in South East Wales. Following their specialist cancer treatment, the VCC then supports patients during their recovery and through follow-up appointments. It also provides end-of-life care. A significant proportion of outpatient and systemic anti-cancer therapy (SACT) activity is already delivered in LHB settings by VCC staff. All radiotherapy activity, meanwhile, is currently delivered at the VCC.

The VCC is part of the wider network of cancer provision across South Wales. Specialist teams provide care using a well-established multidisciplinary team model of service for oncology and palliative care, working closely with local partners and ensuring services are offered in appropriate locations in line with best-practice standards of care. Surgery, high-risk therapy such as immunotherapy, some SACT, specialist investigations such as endoscopy, interventional radiology and specialist care for the side effects of treatment are provided in other hospitals across the network.

The VCC was built in 1956 and is no longer fit for purpose: it has an extensive maintenance backlog and is poorly configured to deal with the growing levels of demand that are projected. Departments are not located in ways that work for patients or clinicians, resulting in inefficient methods of service delivery. There are also multiple 'crossovers' in terms of the movement of patients, visitors, staff and goods. All of this can create a poor patient, and visitor, experience and lead to potential safety risks, which in turn have negative effects on staff.

More specifically:

- A high proportion of accommodation at the existing VCC is not compliant with statutory requirements and creates challenges in terms of maintaining high levels of patient safety.

- The existing VCC, if it were to be built again on a ‘like for like’ basis and in line with Health Building Notes (which give best-practice guidance on the design and planning of new health care buildings as well as adaptations to or extensions of existing buildings), would have a footprint of about 28,000m² compared with the existing building footprint of 17,777m².
- There is no expansion space on the existing VCC site to, for example, install any additional linear accelerators, which limits the Trust’s ability to expand its capacity in response to rising demand for clinical services.
- There is insufficient patient and family car parking at the existing VCC.

In 2019, the following activity took place within the Trust:

• outpatient attendances	67,399
• radiotherapy fractions	55,714
• SACT attendances	26,311
• inpatient bed days	8,232
• ambulatory care attendances	7,605
• referrals	6,767
• inpatient admissions	2,372

There are growth assumptions underpinning these activities, which are set out in the Outline Business Case as follows in terms of growth each year from 2016/17 to 2022/23:

- radiology/nuclear medicine – 9%
- SACT – 5%
- radiotherapy – 2%
- inpatients – 2%
- outpatients/ambulatory care – 2%.

The assumptions for annual increases in solid tumour SACT activity are currently under review. Given the time that has elapsed since the Outline Business Case was drawn up, all these activity assumptions will need to be revisited. Our experts recommend benchmarking these projections with other cancer centres and comment that projections of increases in SACT activity of 5–8% a year are now common. However, they also point out that

recent changes in radiotherapy regimes, in particular hypofractionation for breast and prostate cancer, will tend to reduce activity volumes, although increasing incidence will still need to be taken into account. Moreover, while the changes may reduce the number of attendances for each patient, they have increased treatment times, so radiotherapy machine requirements will be largely unaffected by the changes. The development of more targeted therapies also means that some tumours can now be treated that could not be treated before.⁴

The Outline Business Case for the new VCC proposes to increase the amount of activity undertaken in more local settings to support more equitable access for patients, including access to research opportunities. The assumptions for growth (or otherwise) in activity levels in the new VCC and other areas of the Trust’s work are shown in Table 1:

Table 1: Assumptions for growth in activity levels in the new VCC and other areas of the Trust’s work

Outpatients	SACT	Radiotherapy
Home/local care – 0% to 10%	Home/local care – 5% to 10%	Satellite unit – 0% to 20%
Velindre@ – 30% to 35%	Velindre@ – 30% to 45%	VCC – 100% to 80%
VCC – 70% to 55%	VCC – 65% to 45%	

Note: Velindre@ are specialist units supported by the VCC, providing a range of ambulatory cancer services within LHB sites and working closely with local services.

The activity volumes sitting behind these assumptions and their location options are likely to change once the growth assumptions have been revised. In light of the Covid-19 experience, it would be sensible to consider whether some increase in video and telephone appointments would reduce the assumptions for outpatients.

4 Experience from the Covid-19 pandemic has been of increased use of radiotherapy as a first-line cancer treatment but it is not clear whether this will persist.

Research, development and innovation

The Trust considers that it has established an excellent national and international reputation in research and has several areas in which it excels, specifically early- and late-phase SACT clinical trials, radiotherapy and physics. Additionally, it is supporting new researchers in the nursing and allied health professions to broaden the scope of their research. The Trust has long-established, strong relationships with many of the large pharmaceutical companies and an increasing portfolio of active clinical trials across Phases I to IV. The Early Phase Clinical Trials Programme conducts research using new and novel treatments for patients with solid tumours, including ‘first-in-human trials’ and it is the only unit in Wales involved in this programme. The Trust considers that its brand, and its ability to consistently set up and recruit to target, is an important part of its work and helps in attracting research projects and investment. Maintaining and developing this will be an important marker of success.

The VCC Research & Development (R&D) Task and Finish group was established in September 2020 and is working on refreshing its R&D strategy for publication in early 2021. The group’s remit is to:

- develop the ambition for Velindre University NHS Trust R&D to inform a 10-year R&D strategy
- identify the best model(s) to underpin the ambition, enabling world-class/UK-leading research excellence, resulting in benefits for patients and clinical cancer services as well as income generation through research activities
- articulate the key actions that will be required to achieve the Trust’s R&D ambitions and proposed delivery model
- identify what partnerships are required with higher education institutions and others organisation.

The final VCC R&D strategy needs to align with the All-Wales Cancer Research Strategy, which is due to be published in early December 2020.

The hub for the South East Wales research network is at Cardiff & Vale LHB, given the location of tertiary services, haemato-oncology and the University in Cardiff. However, the importance of network-wide working is recognised to ensure that patients have equal opportunities to access trials and offers a number of important opportunities. While much of this works well, we heard about major frustration with current governance, funding and approval mechanisms across South East Wales, with those arrangements differing in each LHB.

Medical education and training

The analysis in this section of the current situation at the VCC in terms of medical education and training is based on our interviews and very helpful feedback from the VCC Medical Education and Training Task and Finish Group.

There are 12 approved training posts in clinical oncology, two in medical oncology, one in palliative medicine, one in clinical radiology, four in internal medicine training schemes and five in general practice training schemes. There are also six palliative medicine specialist registrars who are placed in the community, hospitals and hospices.

On-call provision is provided by one doctor at senior house officer (SHO) level (either an internal medicine trainee or a general practice trainee), one oncology specialist registrar (medical or clinical oncology) and one oncology consultant (medical or clinical oncology). When a medical oncology consultant is 'first on-call', a clinical oncology consultant provides radiotherapy cover. During the night, there is one doctor resident in the hospital – a general practice or internal medicine trainee who may be in their first year of specialty training (immediately post-Foundation Programme, that is, 'ST1' level).

In recent times, the SHO-level rota (core medicine/internal medicine and general practice trainees), and to a lesser extent the registrar rotas, have had and continue to have rota gaps, meaning that the VCC has been reliant on the recruitment of specialty doctors to make the on-call rota sustainable.

The service performs well in terms of its General Medical Council (GMC) national training survey results and the comments from trainees about working at the hospital, supervision, teaching and other aspects of their experience at the hospital are positive.

We were told about trainees feeling exposed to levels of risk that they were worried about when on-call, although this does not seem to have emerged in the GMC survey, in which no major concerns about safety were raised. Their concerns were clearly reflected in feedback given to the medical education and training Futures Group and provided to us.

The Transforming Cancer Services Programme

The Transforming Cancer Services (TCS) Programme was established in 2014 in response to the pressures of growing incidence and prevalence of cancer and concerns about poor outcomes. In summary, the proposed service model was designed to consist of the following components:

- a strong emphasis on care closer to home and the design of care around the patient's needs
- enhanced care within the LHBs
- three or more Velindre@ specialist units supported by VCC, providing a range of ambulatory cancer services within LHB sites and working closely with local services
- a VCC satellite radiotherapy unit at Abergavenny
- a new VCC including acute care and providing the Velindre@ for the Cardiff & Vale LHB.

The detailed components of some of this have not been developed. This planning process culminated in the approval in 2017–18 by all LHBs of an outline business case for a new VCC to be built on the Northern Meadows,

Cardiff. This would include a Collaborative Centre for Learning, Technology and Innovations as well as a positron emission tomography – computed tomography (PET-CT) scanner and a radiotherapy research bunker. In 2018, approval was given to take forward the procurement of 10 linear accelerators (two in a satellite unit), new computed tomography (CT) and magnetic resonance imaging (MRI) scanners, a new integrated radiotherapy solution and a transformational digital programme including the replacement of the Cancer Network Information System Cymru (CaNISC), which is the information system currently in use.

Planning acute oncology services across South East Wales

Since the VCC business case was drawn up and the TCS Programme was established, concern and focus have grown among clinicians and LHBs in respect of acute cancer inpatient activity.

Many people with cancer present to their local Accident & Emergency (A&E) services and are admitted under acute medicine and a range of other specialties (see Appendix 3, which is available as a separate download on the Nuffield Trust website). These patients often need senior oncology decision-makers to review them early on in their pathway. At any one time across South East Wales, data reviewed by the Nuffield Trust suggests that every day approximately 200 beds are occupied by a patient presenting as an emergency with a cancer diagnosis. These patients are receiving different levels of oncology presence and advice, with implications for equity.

There is a further group of patients who have a cancer diagnosis or who are on treatment who need urgent advice about symptoms or toxicity. A good acute oncology service (AOS) will manage the majority of these patients as outpatients, but there will be a small number of patients who need to be admitted to manage serious complications. These oncology inpatients require multidisciplinary expertise from a range of medical and surgical specialists, palliative and elderly care as well as services such as endoscopy and interventional radiology. Furthermore, recent years have seen the introduction of more complex and toxic treatments, particularly immunotherapy, which need the backup of acute hospital services such as intensive care.

There is widespread agreement among those we have interviewed that the needs of acutely unwell cancer patients should be addressed by developing an integrated AOS for patients across South East Wales, with a service in each LHB. VCC clinicians as well as cancer clinicians, cancer leads and medical directors in the LHBs strongly support this. Collaborative working has taken place during 2019/20 across the region through an AOS Steering Group, set up by the South East Wales Collaborative Cancer Leadership Group (CCLG), to develop the case for change and outline the proposed clinical model. This has included detailed discussions and research into system-wide models elsewhere.

Cancer lead clinicians from each LHB and from VCC gave a presentation of the work to date at a meeting of the CCLG on 14 October 2020. The CCLG agreed the next steps to develop the AOS model, predicated on:⁵

- equity of access – irrespective of LHB of residence, patients presenting to the AOS are assured of equity of access and a common service standard
- shared ownership and delivery – the service model is developed jointly by the three LHBs (Cardiff & Vale, Aneurin Bevan and Cwm Taf Morgannwg LHBs) and Velindre NHS Trust, with clarity around roles and responsibilities.

The proposed model describes how the service will be configured to support patients presenting to the AOS, their initial assessment and management, and how their initial care needs will be met through a combination of input from the LHBs supported by specialist oncology in-reach resources provided through VCC consultants. Further details are provided in **Appendix 2**.

5 Source: CCLG paper on the South East Wales Acute Oncology Service, 14 October 2020.

This collaborative approach to the clearly identified need to develop AOSs across South East Wales is entirely consistent with key messages set out in the recent joint report from the Royal College of Radiologists, the Royal College of Physicians and the Association of Cancer Physicians:⁶

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- AOS are vital for providing consistent and high-quality care for patients, for optimising clinician time and expertise, and for ensuring the best use of NHS resources.
 - Meeting the complex needs of acutely presenting oncology patients across a wide variety of clinical contexts is challenging and deserves to benefit from the same strategic and operational clinical leadership that is already available to site-specific cancer teams.
 - A clearly defined role for consultant oncologists within AO is essential for ensuring effective clinical leadership and oversight.
 - The rising incidence of cancer in an aging population with multi-morbidity will require a multi-professional approach to care, with AOS providing the critical cancer oversight for the majority of emergency cancer admissions.
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6 Royal College of Radiologists, Royal College of Physicians and Association of Cancer Physicians (2020) *Acute Oncology: Increasing engagement and visibility in acute care settings*, p 6. www.rcr.ac.uk/posts/acute-oncology-increasing-engagement-and-visibility-acute-care-settings. Accessed 20 November 2020.

3 What do patients value?

As noted in the Methodology section in Chapter 1, we spoke to nine patients for this report. For a service where patients are attending frequently, often for a short period of the day for weeks at a time (radiotherapy), but also for a long period of the day (chemotherapy), they said that the following aspects are all very important:

- easy access
- a recognisable front door
- ease of navigation
- buildings on a human scale
- a calmer atmosphere than the typical hospital
- availability of support services
- patient information
- protected car parking.

This was echoed in the patient feedback from the VCC patient group, the Velindre support group and Cardiff Community Health Council. It also emerged in the original patient engagement exercises at the beginning of the planning process.

As one patient noted:

For the unacquainted, Velindre is a surprisingly pleasant place. The atmosphere is nothing like that of a typical hospital. It is an incredibly peaceful, positive and friendly place – the staff make sure of it. From the moment you walk through the door, you will feel like a friend and not a patient.

Maintaining good mental health is very important during what are long periods of treatment and then potential recurrence and further treatment. Patients we spoke to feel strongly that environmental design and a range of support services can make a massive difference in this regard.

The themes set out here are also echoed in the research literature on the creation of a therapeutic environment.

The patients we spoke to said that the Velindre brand is very important to them and that it symbolises for them a quality standard. It also provides a significant opportunity for fundraising, which is used to provide additional patient services, benefits and research funding. Patients and their families and friends are often involved in raising funds for Velindre. They feel that many of the add-on services they receive would not otherwise be possible from core NHS funding. These services are highly valued for their contribution to their improved physical and mental health.

4 Looking forward – the cancer system in South East Wales

Strengthening acute oncology and the Velindre@ model

We found a high level of agreement about the principles underpinning the network model of cancer care and enthusiasm about the prospects for making it happen. It is clear that, since the start of the TCS Programme, the management of the acutely unwell cancer patient has become a much greater priority and therefore the development of a high-quality networked AOS across South East Wales is now a pressing priority.

The AOS model is also important for determining the assessment and admission model for the VCC now and in the future. The criteria for AOS assessment and admission in the LHBs and the VCC need to be agreed across the South East Wales health system so that the capacity requirements for all locations can be assessed. This will require data analysis at a population level of those being admitted as emergencies with a cancer diagnosis, as well as those assessed and admitted as known cancer patients across the South East Wales population. As one interviewee at the VCC put it: “We cannot sort out our in-house issues without sorting out AOS.”

Given the recent agreement of the collaborative AOS model for South East Wales by the CCLG, it is our view that this model now needs to be formally linked to the development of the model for Velindre@ services.

The TCS Programme document of July 2020 describes the Velindre@ model as set out below:⁷

Velindre@: These facilities will provide SACT, outpatient services, education and information provision and ambulatory care procedures within LHBs. They will not have inpatient beds – if admission is needed this will be via LHB teams/facilities, supported by oncology teams, or via VCC. They will be planned jointly with LHB teams, supporting collaborative working and helping to meet the needs of LHB and Velindre commissioned parts of the care pathway. This joint working will generate additional opportunities for benefits to patients beyond the scope of the clinical service model (for example, opportunities to support earlier diagnosis or links with surgical oncology or haematology teams within LHBs).

These local centres of excellence will improve efficiency, experience and access by collaboratively developing planned and delivered services within each LHB. With planning, we can move from a variable, poorly planned service to a high quality, sustainable service to deliver care without the need for as many patients to travel to the main Cancer Centre in Whitchurch.

There are some concerns about the model and the lack of detail about how it will function, especially the extent to which it really is Velindre@ rather than Velindre visiting, i.e. will there be sufficient staff and ways of working that achieve the full benefits of having expert staff embedded in local services with opportunities for true multidisciplinary working. The site-specific team for lung cancer expressed these concerns, which others echoed:

The HBs [health boards] have agreed in principle to the TCS model but the implementation of the Velindre@ outreach hubs will be outside the jurisdiction or control of the Velindre Trust. Furthermore, it is not clear what the format of the Velindre@ hubs will be or how they will differ to the service already offered by the lung team in the HBs. It would therefore appear that we may not be able to guarantee how and what care closer to home will look like.

7 (2020) *Transforming Cancer Services in South-East Wales Programme*, draft v 2, July.

Given the proposals from the TCS Programme and the CCLG-agreed model for AOSs, it would seem logical for the two planning exercises to be combined so that each LHB has an AOS that works closely with a standardised ambulatory care model. Clearly, each LHB would need to undertake the option appraisal exercises for the location of both of these service models, taking their own health needs and provider configurations into account.

During the interviews there was strong support for taking advantage of the opportunities offered by both models to:

- create an acute assessment service, possibly with some protected inpatient beds, as the base for the AOS in each LHB – this would primarily be a senior nurse-led service with multispecialty and multidisciplinary input, providing a focus for oncology and palliative care services in particular, and rapid access to diagnostics would be important to make this work
- offer a more comprehensive AOS and footprint at the University Hospital of Wales (UHW) to also provide a research and trials delivery hub and combined acute assessment and trials services with haemato-oncology
- work more closely with haematology teams in the LHBs but also to outreach haematology, ambulatory, chemotherapy and supportive therapies from UHW alongside and in partnership with those for solid tumours – this could include the development of an ambulatory model for haemato-oncology patients on the VCC site for those within a reasonable catchment area
- develop other ambulatory therapeutic services such as dietetics, occupational therapy, physiotherapy, psychological therapy and speech therapy as part of the Velindre@ model
- link into LHB rapid diagnostic services, ensuring that these are protected as much as possible
- provide patient support services such as patient information, welfare support and services such as those provided by the Maggie’s centre at the VCC

- potentially provide a location for future radiotherapy satellite provision to improve access to treatment and also to provide additional capacity, given projected increasing volumes of radiotherapy activity
- use the development of Velindre@ as part of a wider programme to create a more rational and equitable pattern of ambulatory care across the region.

There has been particular support for using the AOS locations as a focus for the provision of palliative care services for cancer patients in the LHBs. A project run by Macmillan in North Mersey identified that 20% of patients referred to the AOS died within 30 days and 70% within 12 months.⁸ The increased involvement of palliative care in this enhanced model would provide clear benefits for patients who would have access to a wider team of specialists and it would also enhance opportunities for education and training in palliative care for the acute and ambulatory cancer teams and vice versa.

Frequency of presentations for pain, disease progression and significant number of patients referred to AO with palliative treatment intent, suggests challenges in the management of end of life care. AO services and regional Acute Oncology strategy should seek to align with palliative care/end of life developments to support this patient cohort including practical steps e.g. considering emergency admissions as a flag to palliative care referral where not already in place.⁹

Recommendations – service delivery

Solutions to the immediate issues facing cancer services across the region, and at the VCC in particular, are required now, rather than at an indeterminate point in the future.

8 E Marshall. Report of the North Mersey Macmillan project.
www.cmcanceralliance.nhs.uk/application/files/1615/8332/8074/FINAL_Report_on_the_North_Mersey_Macmillan_Project_V2.pdf

9 *Ibid.*

There are a number of positive opportunities that will come from developing a networked approach to bring care closer to home, improving links to acute services in local hospitals and building a vibrant research and acute care model based at UHW, working closely with the VCC.

Some of these benefits are achievable before the reprovision of the new VCC and there are services that can be co-located with and better integrated into other services now. In particular, we recommend the development of an oncology footprint at UHW to provide a focus for cancer care and the provision of inpatient beds and an assessment service. This would have the added functionality of providing 'hot' elective activity such as early-phase trials, working with the haemato-oncology specialists in areas such as CAR-T, caring for those with immunotherapy toxicity, protected access to interventional radiology procedures and so on. This implies the relocation of some inpatients currently admitted to the VCC and is explored in more detail below. Such a service, if possible replicated in other LHBs, would provide many of the benefits of co-location – access to interventional radiology, endoscopy, surgical opinion, critical care and so on – albeit without the convenience of complete proximity.

We recommend that, where possible, care for transferring patients and returning known patients should be carried out in AOS assessment services and not in the emergency department.

We recommend the development of LHB AOSs supported by a model for Velindre@ ambulatory services that would maximise the impact of increased oncologist and palliative care presence and support across a wider range of pathways and enhance multidisciplinary working. It would also provide the opportunity for a range of enhanced roles, teaching, training and research opportunities and cross-cover arrangements and should be used as a vehicle to create a more rational and equitable distribution of outpatient care.

Work is required to set out the coordinating, central support services available to these locally based acute oncology and outreach services, for example: a cancer of unknown primary multidisciplinary team (CUP MDT), a 24-hour helpline, on-call support and virtual lunchtime meetings. A good AOS at the VCC would triage sick patients to the UHW/other district general hospitals and avoid admission to the VCC and then later onward transfer.

One area where particular attention is required by the LHBs is interventional radiology for a range of ‘semi-elective’ procedures to support cancer patients.

Recommendations – the planning process

Significant progress has been made over recent months in developing agreement across South East Wales on a model for the establishment of AOSs equitably across the region. This collaborative working now needs to be further developed and applied to ambulatory cancer care plans for Velindre@ services. The scope and nature of the Velindre@ model needs to be described in more detail and expanded to include haemato-oncology and palliative care in a more defined way. Planning in this area needs to be a shared responsibility led by the CCLG.

Work is required to identify the patients who would benefit from more acute oncology expertise who are not currently receiving it.

A data extract needs to be urgently created to enable the activity and capacity requirements for both the AOS and outreach models to be analysed and assessed at a population level so that optimal locations for these services can be determined. It is critical that all the activity and capacity assumptions are agreed and co-owned by the LHBs and the VCC for AOS and Velindre@ ambulatory services so that decisions on location options are fully informed. This will need to take into account plans within LHBs for acute site reconfigurations as well as the development of the satellite radiotherapy service already agreed for location at Nevill Hall Hospital within Aneurin Bevan LHB.

As noted above, a re-baselining of the activity assumptions for solid tumour SACT in the original VCC business case is being undertaken as a result of a significant increase in regimens and additional lines of treatment since that work was done. The view of the expert panel was that based on experience elsewhere this would be likely to be in the range of 5–8% a year, which is higher than the original assumptions.

It is recommended that this TCS workstream is expanded to include activity analysis for haemato-oncology chemotherapy activity across South East Wales so that the two services can be jointly planned for co-location within LHB and VCC ambulatory settings.

Acute inpatient services at Velindre

A key question about the future model concerns the provision of acute inpatient services at the VCC. The final configuration of the inpatient model has been the subject of the most debate and disagreement between people we have interviewed.

One group of respondents is confident that, with modifications, the current assessment and inpatient service is safe and a reasonable foundation for the development of future services. They acknowledge that there is some work to do to improve elements of this, in particular the level of out-of-hours medical support, admission criteria, and the policies on and approach to escalation and agreed pathways for this, including to services not on the VCC site.

There is a second constituency that is concerned about the risks associated with the management of the sickest patients or those who rapidly deteriorate. The concerns relate to the lack of critical care and high-dependency support and issues over getting specialist input and investigations. Endoscopy, surgical opinion and the limitations placed on interventional radiology due to the absence of surgical backup were all raised as issues.

VCC management are aware of these issues and have established two working groups in response to concerns that medical staff at the Trust have raised with them. Proposals are being developed to revise the admission criteria and out-of-hours arrangements to address them. We have also discussed these proposals with our expert panel as part of our review of future options.

The assessment service has been very successful in turning patients around, often back home or on to ambulatory pathways rather than admitting them. This means that there are fewer acutely ill patients in the hospital but those who remain are generally sicker than has been the case in the past.

A two-year audit of VCC patient transfers for specialist medical or surgical care has been commissioned by the Medical Director of the Trust. This has involved reviewing all patients transferred out from the VCC to an acute hospital between September 2018 and August 2020. It is important to note that the detailed analysis of this data continues. Key highlights presented to the internal taskforce on this issue on 4 November 2020 were as follows:

- Of admissions to the VCC, 4.5% were transferred out of the VCC for medical/surgical input.
- All patients had received timely review and assessment, and commencement of required intervention before transfer.
- The majority of patients who were transferred had this decision made on the day of admission.
- No patients deteriorated while awaiting transfer.

The number of transfers was broadly consistent with the number reported by the Welsh Ambulance Services NHS Trust (WAST).

Ambulance transfers

The need for the ambulance service (WAST) to assist was the theme of a number of concerns that we heard and indicates the level of risks that are being managed. It should be pointed out that even general hospitals have a significant number of urgent transfers to other centres for specialist care, for example neurosurgery and complex vascular surgery. However, ‘red’ 999 calls (indicating an immediately life-threatening situation) from the VCC do reflect a need for a high level of support. The number of 999 calls from the VCC by category of call between 2015 and 2019 are shown in Table 2.

Table 2: 999 calls from the VCC, by category of call, 2015–19

	Red	Amber	Green	Total
2015	0	8	11	19
2016	6	54	37	97
2017	13	60	26	99
2018	11	60	22	93
2019	11	69	25	105

Note: Red indicates an immediately life-threatening situation, amber indicates a serious but not immediately life-threatening situation and green indicates neither a serious nor a life-threatening situation.

The Emergency Medical Retrieval and Transfer Service (EMRTS) is a service for Wales that provides pre-hospital critical care across Wales, delivered by consultants and critical care practitioners. In the five years since it was established in April 2015, EMRTS has recorded just two attendances at the VCC. However, there are instances where telephone advice is taken from the EMRTS team.¹⁰

The Trust is awaiting clarification from WAST as to whether it is able to identify patient location from its dataset. However, VCC-held data show that between July 2019 and July 2020, the main priority transfers to UHW were from the Acute Oncology Assessment Unit on the same day as the patient review on the unit.

WAST also provided data on response times for 2019 and these show that response times for red calls were all under two minutes. Response times for amber patients were significantly longer, with a median of 50 minutes, but 15% were of two hours or more. This reflects common practice in which ambulance services tend to regard patients already in hospital as being in a place of relative safety. While no untoward incidents associated with this were reported, our interviews did suggest that these delays could be an issue and on occasion create anxiety for staff and lead to concerns about safety.

In addition to the 999 calls detailed above, there were a very small number of other non-urgent transfers. The majority of transfers were to UHW.

Specialist referrals

There is some difference of opinion between interviewees about the extent to which the onsite presence of a specialist is key in providing advice and whether or not other hospitals should be willing to accept transfer requests from oncologists where they determine that a specialist opinion is required. Sharing CT images and a discussion on the history and clinical findings may be sufficient for many of these patients, but there are exceptions to this and not all of those we spoke to were comfortable with this model. As one interviewee noted:

¹⁰ Information supplied by the VCC.

[We should be] making better use of virtual rounds and technology to connect services to improve care without being on a large combined site. The key is in the word ‘integrated’. We need to be truly integrated, not just lip service. The patient will then know they are supported by their oncologist and a wider team of specialists, some of whom they may never need but they don’t have to be in the same physical building.

Recommendations – service delivery

The proposed model would see more inpatient work at hospitals in the network, but the VCC is of the view that inpatient provision will still be required at the VCC site. The current model has a number of safeguards in place and is being strengthened further, but the key question is whether this is a robust approach for the future. During the course of our work, the Trust proposed a new set of admission criteria that would further reduce the risks associated with sick patients out of hours.

We recommend that the new model should not admit patients who are at risk of major escalation to inpatient beds on the VCC site. Bed capacity for these patients should be provided as part of the enhanced Velindre-supported service at UHW and in local district general hospitals. This change can be put in place before the development of the new VCC and will allow the new model to be reviewed and refined over time, ready to move to a new location. We recommend the continued review of admissions criteria at VCC and across the region as good practice as cancer treatments and care evolve.

The VCC system should provide central support functions such as the 24-hour helpline, virtual multidisciplinary team meetings, on-call support and so on, as set out in the clinical model proposed by the AOS Steering Group and approved by the CCLG.

In general, it is clear that the inter-hospital/specialty pathway requires significant work to make this appropriate for the type of network model envisaged in the TCS strategy. We were disappointed to hear familiar stories about the amount of effort required to negotiate the transfer of patients between hospitals in the network. We therefore recommend that work is done to develop better collaboration between hospitals to facilitate urgent transfers.

To support inpatient care, outpatient clinics and multidisciplinary teams, the use of technology to support the remote provision of specialist support needs to be further developed.

Recommendations – further planning

It will be important to assess the number of unwell patients who would need to be lodged elsewhere but then transferred to the VCC site for radiotherapy. The data supplied to us suggest that the number of patients involved is not large.

In keeping with good practice, our experts recommended that VCC and the region should constantly seek to review the admissions criteria including external review and benchmarking to develop solutions which enable unnecessary admissions to be avoided and improve patient experience.

Ambulatory care at the VCC

In contrast to views on inpatient services, we heard very little concern about the model proposed for ambulatory care, including SACT and radiotherapy. Our conversations with local and national experts suggest that there will continue to be a major role for these services, given the increasing incidence of cancers and the development of new treatments and technology.

As noted in Chapter 3, patients greatly value the environment and culture of Velindre, and its convenience in terms of travel and parking. This is a very significant factor in the current decision to retain the services in a standalone location.

Recommendations

The satellite radiotherapy unit and proposals to further develop a more rational distribution of ambulatory care across the region is a sensible direction of travel that will improve equity of provision and access.

In line with bringing the Velindre@ and AOS services more closely into alignment with haemato-oncology, we recommend that the new VCC should

provide routine low-risk SACT for haematology, transfusions and potentially outpatient clinics, to offer the convenience and enhanced environment to these patients as well. We recommend that the scope to expand other outpatient activity, including joint clinics, with other specialties is explored.

Our expert panel recommended that consideration be given to providing high-volume endoscopy, particularly for cancer screening, at the new VCC and to enhancing the treatment options available to ambulatory patients. This is in line with trends internationally to separate routine diagnostic care from emergency and other inpatient work. In future, other day-treatment options could be added, including day surgery, depending on how much of the inpatient provision continues to be needed.

5 Building research excellence

The Velindre Futures Group provided us with helpful and thoughtful perspective on building research excellence and a number of interviewees also had an interest in this area. Group members identified a wide range of research, development and innovation opportunities that speak to the importance of building research excellence but also acknowledged that an agreed R&D strategy was still required and a report from the group is planned for early 2021. Nonetheless, there is sufficient clarity to allow a number of firm conclusions to be drawn that are likely to stand whatever decisions are taken about the individual elements of the strategy. There are some differences in emphasis and priorities but a high level of agreement on the most significant issues.

Whatever the solution for the VCC itself, successful research is a key element of high-quality cancer provision, as one respondent put it:

R&D is a key aspect of patient-centred, future-proofed, high-quality cancer care – it contributes to major advances in cancer care, it allows us to offer better/newer treatments to our patients and there is increasing evidence that patients treated in research-active environments have better outcomes and receive better care, even if they are not directly enrolled in trials themselves. R&D is also potentially income generating, enhances an organisation’s reputation/credibility and attracts and retains staff.

The need for a strong centre

There is agreement that the nature of the current and proposed services at the VCC make it unsuitable for some types of research due to the high levels of risk associated with the treatments carried out at the VCC. The quote below summarises the issue and we have not heard any significant dissent from this point of view:

Phase 1 trials are the crucial link between the laboratory and the clinic where new drug/drug combinations are given to patients for the first time.

Velindre has developed a varied portfolio of trials over the last eight years, giving Welsh patients with no standard treatment options the opportunity to get access to new drugs without the requirement to travel to English centres. Over the last four years, this has saved over 16,000 hours of patient travel time, crucial in a group where time is so precious.

The primary endpoint of Phase 1 trials is safety. Velindre policy is that only oral compounds can be safely delivered in a ‘first-in-human trial’ at the standalone site. Intravenous compounds can be delivered in a Phase 1b at Velindre as long as a rigorous assessment of risk is carried out.

The majority of new oncology agents involve immuno-oncology drugs which are administered intravenously. Even Phase 1b trials can have moderate risks of a cytokine storm due to the synergistic nature of agents used in promoting an immune response. The use of vaccine and cellular therapies is only going to increase this risk.

The future delivery of Phase 1 trials in Wales will largely need to take place on a site where immediate escalation of care is possible, and also the provision of additional medical specialty support. This is not part of the new Velindre site plan and therefore Phase 1 trials will need to take place elsewhere.

This speaks to the need for a strong research hub at UHW and also at other hubs across the network.

Another respondent noted:

We need a VCC R&D solution that is able to accommodate and adapt for the future. [This] mandates a Velindre research footprint (VCC research @) co-located with our majority partner researchers associated within the Cardiff & Vale site alongside Cardiff University/School of Medicine.

This will then support:

- advanced cellular and gene therapeutics
- early-phase and [first-in-human] studies
- access to facilitative infrastructure: namely ... oncology beds, medical and surgical colleagues, escalated care including HDU/ITU [high dependency unit/intensive therapy unit]
- routine access to surgical tissues and interventional biopsy samples to build comprehensive translational research.

In addition to synergies with other clinical disciplines, this offers opportunities for closer working with the university, which are going to be increasingly important in a number of areas as the need for multidisciplinary research expands (also bringing in approaches found in the wider university). All of the following quotes reflect the approach to the research strategy in other cancer centres.

Cardiff & Vale have an active haem-oncology research group who are very much involved with Phase 1 trials with both ITU/HDU, as well as multiple other medical specialties on site. Given the similarity of therapeutic approaches between oncology and haem-oncology, there is a strong rationale in combining resources to give a greater critical mass of staff with the relevant skill set. Such an approach would involve a Velindre footprint at UHW with both infrastructure and staff resources supplied to generate a cancer [research unit] in collaboration with the haematology group. This could also align with the Bone Marrow Transplant Unit, an Acute Oncology Facility and other Velindre R&D activity, to generate a vibrant cancer research hub with the provision of safe patient care.

This view was endorsed by others, who also stressed the importance of improving interaction between different parts of the system:

Translational research: bridging the gap between [basic] researchers and patients. Requires physical connectivity and communication between clinical researchers, lab/other scientists and patients. Enables translation of novel drugs/virotherapies/approaches from lab to clinic ... [a] translational research hub for clinical and laboratory researchers with direct links to biobank, surgical/interventional radiology, laboratory ... centre/infrastructure/staff to develop new research ideas/project grants/protocols etc i.e. support study development and new investigators.

[W]e would want to maximise the potential for translational and reverse translational science. Therefore developing a footprint that seamlessly allows [first-in-human] and early-phase trials to be rolled out, with consideration for how the set-up might look for delivering new forms of CAR-T cells or oncolytic viruses for example, having the facilities in place for patients to stay and be monitored and so on. Also for reverse translation – finding a way to optimise the ‘bed to bench side’ access to clinical materials, on site or in as seamless way as possible, would be ideal.

On-site contact across oncology between NHS/academic clinicians and basic science teams, building collaborations to enable transition from discovery medicine through to clinical research. Also cross-fertilisation of new research ideas between all medical disciplines, including genomic medicine and pathology.

Medical student exposure to inspire future aspirations.

A successful research network

Making the network of research work well across the whole of South East Wales will be as important as the development of a strong UHW research hub. Increasing the number of patients who can benefit from participation in trials will help improve equity of access and outcomes and will also make the network more attractive to partners. As a group member pointed out, “[we] need a mixed portfolio [and] want to provide more access for patients”.

There is clearly work to do to grow the network, as the following group member identified:

Patients are going to be spread across all settings and the model will have to prove itself in terms of:

- cohesive working across R&D departments to get studies open in all settings and allow researcher access
- flexibility with research nurse/practitioner working across sites/settings
- championing cancer studies in the very competitive environment of getting studies open in non-cancer environments
- presence: we’ve got to be better at being visible in non-cancer centre environments if we are to succeed.

The limited and rather theoretical literature on research networks endorses these points, and suggests the following common elements:¹¹

- a shared vision
- formal governance policies and terms of reference

11 Hagen NA, Stiles CR, Biondo PD, Cummings GG, Fainsinger RL, Moulin DE, Pereira JL and Spice R (2011) ‘Establishing a multicentre clinical research network: lessons learned’, *Current Oncology* 18(5), e243–e249. www.ncbi.nlm.nih.gov/pmc/articles/PMC3185906. Accessed 20 November 2020.

- an infrastructure team dedicated to the goals and activities of the network
- regular and effective communication
- a framework for holding members to account
- a succession planning strategy to address membership change over time
- multiple strategies to engage network members
- regular reviews of goals and timelines
- a balance between structure and creativity.

Clearly, there is a lot of work to do to ensure that some of these elements are in place.

Recommendations

An agreed research strategy is clearly a priority. This needs to include research in its widest definition, including research led by disciplines other than medicine.

There is more work to do to make the network model work well and in particular to remove some of the governance and bureaucratic barriers to research across sites and LHBs.

There is a close alignment between the strategy for cancer services, the development of the research network and our recommendation for a research hub at UHW to be developed alongside the enhanced Velindre-supported AOS, detailed above. This should work closely with the haemato-oncology service and include much better-coordinated working with other specialties. This would enable Phase 1 trials to take place at UHW that require ITU support and also other Phase 1, 2 and 3 trials at the VCC and in Velindre@ locations. Phase 1 trials are important but the capability to do a wide range of trials across the network is even more so.

The other Velindre@ units in LHBs need to be viewed as a key part of the research delivery network and supported accordingly as they also have access to large numbers of patients and support from ITU and other specialties.

One of the experts we spoke to would encourage this group to ensure it has benchmarked the research approach and capabilities with other comparable research networks.

Some members of the research group have a preference for the location of the radiotherapy research bunker to be at UHW rather than at the new VCC. However, opinions differ and there is an efficiency penalty for this. There are some emerging research areas in which immunotherapy is combined with radiotherapy, which might suggest that location should be considered. However, given the uncertainties around the future of the UHW site, practical obstacles (see [Appendix 1](#)) and the efficiency penalty, we suggest that at present the linear accelerators should be provided in a single bank at VCC with arrangements made to transport patients or research staff where required.

6 Cancer planning in South East Wales

There are clearly some issues about the approach to cancer service planning across the South East Wales cancer system over recent years. The planning and delivery of cancer services for South East Wales needs to be brought together and improved in the absence of a single body that is responsible and accountable for the cancer strategy. It cannot be the responsibility of a single organisation that is only delivering part of the cancer pathway.

Clear leadership and accountability for cancer commissioning and service delivery at a senior level in each LHB is required to ensure that the CCLG can fulfil its role as set out in its terms of reference. There needs to be a more coordinated and collaborative approach to the development of the cancer strategy for South East Wales. The recent establishment of the CCLG is now addressing this, but there is more to do. The development of a workforce strategy is also required to address the staffing requirements of the new model and to build on good work that has already been done to develop extended roles.

7 Conclusions

Cancer services in South East Wales face a quandary: the current VCC site at Whitchurch, Cardiff is no longer fit for purpose when faced with the twin pressures of a growing cancer population with increasingly complex health needs and the physical design and capacity problems of the existing site. Co-location of a new cancer centre at UHW is preferred by many and in line with trends elsewhere. However, this is not possible within the timescales needed to improve and enhance cancer services in South East Wales.

In response to this, the network model has been developed. These proposals offer significant advantages to patients in terms of access, equity of provision, access to research and, for outpatients and other ambulatory patients, care closer to home or in a new accessible and therapeutic environment at VCC. It should also offer opportunities for improved research activity and better coordination of care across the system.

For most inpatients and emergency ambulatory patients many of the benefits of co-location in terms of access to other specialists, critical care, surgery, endoscopy, etc. can be realised through the development of local acute oncology and inpatient care. This solution lacks some of the convenience for staff and opportunities for interaction to support innovation and cross-referral and methods for dealing with this using digital and other techniques should be explored.

Our detailed recommendations are in the body of this report but in summary, our main conclusions are as follows:

- 1 The planning process for all South East Wales cancer services needs to be reviewed and its coordination improved, with the development of a common dataset and planning approach put in place. Steps have been taken to support this and it is going to be very important that the CCLG is effective – this will help to fill the strategic gap in the planning of cancer services that has existed across South East Wales. There are some lessons from the development of the more successful cancer alliance

models in England that could be followed. These take responsibility not only for the planning of cancer services but also for leadership and performance management.

- 2 Full co-location would have advantages but is not practical for a significant period of time. However, action is required soon to deal with the issues with the estate and linear accelerators at the VCC.
- 3 In the near future, each LHB needs to:
 - develop and implement a coordinated plan for:
 - analysing and benchmarking cancer activity against other areas
 - advice and decision support from oncology for unscheduled cancer inpatient admissions via A&E
 - acute oncology assessment of known cancer patients presenting with symptoms/toxicities, with inpatient admission an option on a district general hospital site if needed, complemented by the Velindre@ ambulatory model, bringing models for haemato-oncology and solid tumour work together
 - consider the lessons of Covid-19 in terms of remote access for patients and the remote provision of advice, multidisciplinary team meetings and other methods for improving access to specialist opinion.
- 4 The new model should not admit who are at risk of major escalation to inpatient beds on the VCC. These patients should be sent to district general hospital sites if admission is required, to avoid a later transfer. The admission criteria for inpatient admission to the VCC therefore need to be revised to reduce the risks associated with acutely ill patients. Regular review of admissions and transfers should be used to keep this and the operation of the escalation procedures under review.
- 5 To support recommendations 4 and 5, and the research strategy, a focus on cancer including haemato-oncology and a hub for research needs to be established at UHW. There would be advantages to this being under the management of the VCC, but in any case, the pathways between specialists need work in order to streamline cross-referral processes. Such

a service would provide many of the benefits of co-location – access to interventional radiology, endoscopy, surgical opinion, critical care and so on – albeit without the convenience of complete proximity.

- 6 The ambulatory care offer at the VCC should be expanded to include SACT and other ambulatory services for haemato-oncology patients and more multidisciplinary joint clinics. Consideration should be given to expanding a range of other diagnostics, including endoscopy, to create a major diagnostic resource for South East Wales that will be able to operate without the risk of services being disrupted by emergencies and which would also protect these services in the case of further pandemics.
- 7 The Velindre@ model needs further work to describe how it will operate, its interface with acute services and its relationship to the wider pattern of ambulatory care. This should include the integration and development of other ambulatory therapeutic services such as dietetics, occupational therapy, physiotherapy, psychological therapy and speech therapy.
- 8 The development of a refreshed research strategy is a priority and further work is required to fully take advantage of the networked model.
- 9 Organisational development and other work to create a successful cancer network is going to be required but has not featured much in our conversations for this report.
- 10 Flexibility in design is going to be important both for the new VCC and for whatever is developed at the new UHW due to the rapid change in the nature of treatment and research.
- 11 There are future strategic development opportunities provided by the development of a new VCC and a proposed UHW2. Working together over the 15- to 20-year window, the health system should look to exploit these development opportunities in light of future service needs.

Appendix 1: The potential for co-located services

Trends elsewhere

There is no research that can give definitive answers to the question of how best to organise cancer services. However, the general trend is towards networked models that attempt to maximise the range and volume of care that can be provided close to where patients live, with the centralisation of highly complex work to focus expertise, take advantage of economies of scope and scale and maximise research opportunities.

A similar trend combining networked care and the centralisation of rare and complex work is seen in some other specialties with a high technology care component. As a result, an international trend has been for single-specialty hospitals, and other focused institutions such as cancer hospitals, to be co-located on acute sites, often a teaching hospital or in some cases simply merged into the main hospital. Those that continue to operate as standalone centres are sufficiently large to be able to support the general medical and surgical care of patients, including critical care, as well as having access to advice across a wide range of specialties. However, even these models are now being questioned.

The reasons driving this trend in co-location are as follows:

- Patient expect to receive joined-up care and to have access to expertise.
- Unplanned moves and transfers disrupt continuity of care and, in the case of ambulance transport, put patients in situations where providing high-quality care can be physically difficult and care is delivered by staff who

are less experienced. The problem is made more difficult as, unfortunately, cooperation between hospitals is not always as good as it might be and what ought to be a smooth transfer of care is delayed by long negotiations that waste clinicians' time and delay patient care.

- Safety – the management of acute illness can require immediate access to a range of clinical disciplines. Some of this can be provided by telephone or video but there are cases where it is necessary for an expert to examine the patient in person or perform a procedure. While more emergency care is dealt with as a 'quasi-scheduled event', with complex procedures delivered in hours by senior staff rather than at night, this is not always possible in specialties such as cancer and vascular surgery.
- Trends in the toxicity and complexity of treatment and the growing number of patients with comorbidities and side effects from treatment mean that access to critical care and advanced support to deal with rapid deterioration is very important.
- The need for multidisciplinary advice and other input – in particular, surgery, interventional radiology, endoscopy, critical care and a number of other services – has increased with the growing level of complexity of treatments. The combination of these treatments with radiotherapy is important for both patient care and research.
- Medicine is becoming increasingly specialised and our interviews suggest that oncology is experiencing a two-fold impact in this respect. First, specialists are focusing more on one or two areas of cancer care rather than on a larger number of areas; and second, they are becoming less comfortable with the management of the acutely ill patient with other comorbidities (this is in line with experience in other areas of specialised medicine).
- Co-location can fulfil the critical mass required to provide viable rotas and education and training experience. This is particularly an issue for middle-grade and junior medical staff, as they need to gain more acute medical experience as a result of recent changes in GMC requirements.

- The evidence suggests that for some types of care, a minimum number of procedures is needed for the development of expertise. This is a particular issue in surgery (for example, neurosurgery such as endoscopic surgery in patients with brain tumours, pineal tumour resection and pituitary surgery), a number of gastrointestinal procedures (pancreaticoduodenectomy, oesophagectomy and so on), and renal, breast and other complex procedures that often require team-based expert after-care. Vascular surgery, stroke care and other specialties are seeing a similar trend.
- The opportunities that arise from bringing haemato-oncology and solid tumour work together – for both clinical services and research – can be exploited.

It should be pointed out that co-location does not automatically confer all of these advantages. Specialised services embedded in larger institutions may still find it difficult to get opinions from other specialists, access to critical care and so on. Geographical proximity is not a substitute for creating a collaborative culture, but it generally seems to help.

Separate identities

Co-location can mean that the unit is absorbed into the main hospital but often the specialist unit can still retain a distinct identity. It may have a separate building (for example, the cancer centres at Guy’s, Leeds, Liverpool and University College Hospital) or a physically distinct wing (for example at the Edinburgh Cancer Centre, Evelina London Children’s Hospital and St Mark’s Hospital at Northwick Park). In the case of Guy’s and University College Hospital, ambulatory services are in a separate building some distance from the main hospital. In some cases the unit may even have a separate organisational form even though it is on the campus of a larger organisation (for example, the Clatterbridge Cancer Centre and the Royal Papworth Hospital at Addenbrookes). The reasons for these approaches are not always made explicit but seem to be based on the following:

- Patients value services with a strong identity and reputation for quality.
- There is a perception that it is important to have a strong management of and clinical focus on a particular service line and a wish to protect important aspects of the culture of the hospital or service. Lessons have been taken from, for example, the loss of something important (if unquantifiable) from the ingestion of standalone hospitals such as Atkinson Morley Hospital by St George’s Hospital and the London Chest Hospital by Barts Health NHS Trust.
- Some believe that there is a need to protect specialist inpatient beds from emergency services and, very pertinent in the light of Sir Mike Richard’s review of diagnostic services,¹² to avoid the loss of protected access to specialist diagnostics. There are similar arguments about theatres and critical care – the main reason for delays in many specialised services that are part of larger institutions is a lack of critical care beds for post-operative patients.
- There are advantages for research and multidisciplinary practice from maintaining the coherence of different services (while also having the advantage of being close to a tertiary hospital and university).
- Our work also suggests that smaller units with a clear, well-understood purpose have some significant advantages. Staff like working in these types of units; specialist hospitals regularly top staff and patient survey results. The human scale and clear focus also seem to make it easier to provide effective leadership and management and avoid the costs and problems of complexity in large hospitals. Big is not always better.

12 Richards M (2020) *Diagnostics: Recovery and renewal*. NHS England. www.england.nhs.uk/wp-content/uploads/2020/10/BM2025Pu-item-5-diagnostics-recovery-and-renewal.pdf. Accessed 21 November 2020.

Other issues

There is a general trend in hospital planning in the UK towards separating emergencies from planned activity, which has been intensified by the experience of dealing with the Covid-19 pandemic. Protecting diagnostic capacity from emergency work and providing more rapid access to diagnostics for patients with worrying signs and symptoms is a key idea underlying Sir Mike Richards' recent review of diagnostic services and reflects practice in European countries. This has proved very valuable during the Covid-19 pandemic, and where cancer capacity has been housed in standalone buildings, hospitals have, by and large, been able to protect that capacity to continue to diagnose and treat patients, as well as protect the patient environment from Covid-19 transmission. Patients in our interviews raised this as important given their immunocompromised status. This is, of course, still possible on a co-located site but is an argument for some degree of separation and control over access to the cancer elements of such a campus.

Practical issues

Our assessment, following discussions and an examination of existing plans, is that a full co-location is not practical at present. It will be possible in future, but our view is that co-location before the re-provision of the main acute facilities at UHW would be difficult to achieve. Using currently vacant space at UHW does not provide physical proximity of the type that is required, and more seriously, appears to limit the options for an optimal rebuilding of UHW.

A decision to co-locate would require a very different building, based on experience in Leeds and Liverpool, and should probably combine all cancer services, including haematological malignancy and surgery. This would result in a functional content for the new building that is different from that currently proposed. Therefore, if this option were available, a whole new round of planning, design and planning permissions would be required, which would push back a start date further.

The current VCC, including linear accelerators and diagnostics (a 30,000m² building and associated accommodation including 700 parking spaces),

covers 7–8 hectares. The current UHW site is around 23 hectares. The problem is not solved by assuming a high-rise replacement for the VCC¹³ as this would require 6 hectares.

In all plausible scenarios, given the size of the UHW project and the enabling works required, VCC would have to wait for the correct moment in a phased redevelopment and this is likely to take a significant period of time.

Conclusions

Co-location would be in line with practice elsewhere, address the questions of how to provide safe acute inpatient care, improve support from other specialties, and create a better base for research. But it does not address the wider problems of equity of provision and the need to improve AOSs and other cancer services across the network. Whatever may be possible in the future, we are satisfied that a co-location option is not available at present nor for some considerable time to come, and so there is a question of how to provide services now and in the foreseeable future.

Flexibility in design is going to be important both for nVCC and for whatever is developed at the new UHW due the rapid change in the nature of treatment and research.

An important comment by two of our experts provides some reassurance about the future. In 15 years, the next generation of linear accelerators at a new VCC will have reached the end of their useful life. At this point there may be an opportunity to strategically review service configuration across the region, and between Cardiff LHB and Velindre University NHS Trust to identify further opportunities e.g. how they configure services across the locations and facilities to maximise the opportunity. It is clear that providing a high-volume diagnostic and treatment centre with the option to add day surgery and manage inpatient flows as treatments change offers significant flexibility and future proofing.

13 The new Guy's Cancer Centre has installed linear accelerators above ground, although there are penalties in terms of the costs of installation and replacement.

Appendix 2: Requirements of the acute oncology model agreed by the CCLG in October 2020

The CCLG paper on the South East Wales acute oncology model states that:¹⁴

It is proposed that the service model will, as a minimum, meet the following requirements:

- Have a focus on the AOS pathway from presentation at the acute hospital setting to discharge (noting that the links to primary care are a fundamental part of the AOS).
- Aim to avoid unnecessary admission/readmission but where this is required to minimise acute length of stay and maximise the use of ambulatory pathways to access oncology support.
- The AOS in Health Boards should be clinically led by a designated HB AOS lead supported by an appropriately resourced and skilled nursing team and AHPs [allied health professionals].
- AOS nurses will have a presence in both assessment and ward settings to support the patient throughout their pathway.

¹⁴ Source: CCLG paper on the South East Wales Acute Oncology Service, 14 October 2020.

- Velindre will support the model through a ‘consultant of the day’ arrangement, comprising a combination of predictable, timely and consistent physical senior oncologist presence and virtual access (to support HBs when the consultant is not on site) which will be built into consultant job plans for those participating in AOS.
 - A provision for acute cases with an unknown primary (CUP/MUO) (with additional pathway work to link in with phase 2 and 3).
 - A virtual service to manage both inpatient & ambulatory immunotherapy toxicity.
 - Digital solutions to support virtual access and access to comprehensive patient and clinical information irrespective of presenting location.
 - Designated administrative support to allow clinicians to focus on clinical care, improve communication between sector and discharge planning.
 - Health Boards should attempt to identify a suitable location within the hospital where AOS patients can be cohorted and seen by the Oncologist without the need for undue patient movement – ideally this should be in a ward rather than clinic environment.
 - Long term, Health Boards will ideally identify a ‘designated’ acute hospital site as the focus for their AOS service with access to assessment beds on a 24/7 basis, however, this will be supported by nursing input in other acute sites.
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