

UHW2 Clinical Strategy



Introduction

Background

The nature of care provision and the role of the hospital are changing rapidly and radically. In response to significant external and internal forces, healthcare providers are being challenged to address multiple imperatives. These include:

- adapting to changes in patient populations and patient needs
- the recognition that numerous modalities of care can be provided outside of the hospital in alternative settings
- difficulties attracting and retaining an appropriately skilled workforce
- challenges associated with financial sustainability
- understanding the need to shift from disease treatment to health management, and
- the need to place sharp focus on value and accountability.

To this list, we could add the need to factor in adaptability in order to respond to population health crises, such as the Covid-19 pandemic.

Recognising these challenges, Grant Thornton UK LLP (GT) and Academic Health Solutions (AHS) are engaged to further develop the Cardiff and Vale University Health Boards (C&VUHB) clinical strategy which will underpin their Programme Business Case (PBC) and inform the nature of the redeveloped hospital (henceforth referred to as UHW2) and the wider system transformation journey.

The proposed clinical strategy sets out how UHW2 will evolve its function as a research institution, a tertiary centre, and a key component of the wider healthcare ecosystem, operating at the cutting-edge of healthcare delivery as the *Research Hospital of the Future*, and be recognised as a top 10 health system globally.

UHW2 will not function as a centralised command and control centre in which all services are delivered under one roof. Instead, it will become an international exemplar for how the *Research Hospital of the Future* will function, operating as a central analytics hub that synthesises and triangulates patient and system level data. As such, every willing patient will fulfil the role of a *Research Patient*, with the data they generate on their clinical journey, captured and assimilated to advance the wider research agenda and improve care outcomes.

Reinforcing the need for UHW2 to develop in this manner, is a robust case for change, one that illustrates how **a combination of demographic pressures, novel health challenges, new opportunities in health and social care, public expectations, service sustainability and technological and scientific developments are catalysing seismic shifts within the hospital setting and the wider healthcare ecosystem.** These profound influences are explored in more detail in the following sections. In responding to these change requirements, UHW2 will need to be cognisant of the national policy imperatives that underscore this transformation, while designing a portfolio of integrated services that overcome the challenges associated with contemporary care delivery.

In order to build the case for change and support the development of this strategy, GT and AHS have established a **robust methodology for undertaking clinical strategy review** as part of a series of preparatory activities, which has been tried and tested across other hospital sites. This review is based on the following activities:

1. Understanding C&VUHB's current status
2. A policy review looking at the implications of national and local policy initiatives for the clinical strategy

3. An examination of the evidentiary base to determine which advances in science and technology have the most potential to benefit health and need to be considered in a major reconfiguration of clinical services.
4. Identification of examples of innovative practice as points of comparison and inspiration both nationally and internationally.

We then converged our findings from these preparatory activities into a series of concepts and principles that were then tested in a series of strategy workshops involving a wide range of clinical and managerial staff from across the system. In these workshops we identify the strategic implications at a high-level across core 'blocks' of care. These blocks represent the major constellation of services that need to be considered if UHW2 is to push the boundaries of how healthcare is planned and delivered.

The Case for Change

Significant change in the planning and delivery of health services is a priority across the UK, mandated by a number of factors, with the pressure for transformation being accelerated by the Covid-19 pandemic in the last 12 months. It is becoming increasingly clear that doing more of the same in the same way is not the answer. Consideration of this comes at an opportune time for C&VUHB as it develops its Programme Business Case for UHW2. The case for change to support the PBC is summarised below, setting out the need to build a health care system that meets future population needs; improves current provision; aligns with the policy priorities of the Welsh Government; enhances the role of the hospital in medical innovation; and creates a sustainable healthcare delivery system that builds in flexibility and adaptability to anticipate future challenges.

Drivers for change

Current systems are increasingly unable to meet demand and respond at speed to emerging challenges. A range of factors (below) illustrate the need for transformational change in the structure and delivery of health and social care and the role of a contemporary University Hospital in rising to that agenda.

Demographic pressures

The population served by C&VUHB, like that across the UK is aging, with people living longer. This has resulted in pressure to design services that can address the consequent multimorbidity and frailty of an older population, and a clear mandate to retain independent living at home (or in a homely setting) wherever possible.

Chronic health conditions

The prevalence of a range of chronic health conditions has increased markedly, placing unanticipated pressures on healthcare systems worldwide; in the catchment area of C&VUHB the population prevalence of obesity is high, with the concomitant impact on rates of diabetes, cardiovascular disease, and a range of common cancers. Increasingly, co-morbidity is present, with a major impact on frailty and ability to sustain independent community living. Added to this is the impact of greatly improved detection and outcome measures for many cancers, with the result that for many patients, cancers are now chronic health conditions requiring long term maintenance treatment and supervision. The way healthcare services are designed and delivered needs to recognise the impact of these trends.

Novel health challenges

The impact of the Covid-19 pandemic on delivery of healthcare has amply illustrated the disruptive potential of new diseases. Future pandemics can be anticipated, and the demographic and chronic disease pressures outlined above illustrate the need for future provision to have capacity and adaptability to respond at speed to new unanticipated challenges.

New opportunities in health and social care

Rapid changes in science and technology have revolutionised the ways in which services can deliver high quality care. These include opportunities for remote consultation; long term curation of personal health and social data that allows greater anticipatory, personalised, and precisely designed interventions to maintain health; and advances in better treatments (vaccines; targeted cancer therapies; etc). The ability to exploit these developments is critically dependent on:

- i) a medical innovation system that is geared to address unmet health need at pace, requiring close alignment between UHW, its principal University partner, and the life sciences sector; and
- ii) closer integration of hospital with community delivery of care, and multi-disciplinary teams at the heart of care planning and delivery.

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The prevention opportunity

Hospitals have historically been the site for treating established disease that requires their specialist expertise and technologies. That need will persist but there are emerging opportunities to introduce pre-emptive treatments to sustain health that are best evaluated in a clinical academic environment in the first instance, further leveraging the relationship with the University. Seizing this opportunity recasts the hospital as part of a system-wide commitment to health and wellbeing as well as treating established disease that needs its expertise

Public expectations

Public expectations of the extent, location, and responsiveness of health care are, rightly, much higher than previously, with the needs of patients being the key driver of design of healthcare, leading to the need for transformational change in access, equity of provision, and integration of health care. The policy statements of the Welsh government, including the plans for Prudent Healthcare reflect this change public expectations, and require a response from those responsible for planning of future health and social care services. The public also expect their personal health data to be kept securely with due regard for privacy and their wishes as to how their data will be used.

Sustainability

Use of hospital facilities is the most expensive part of the system. Given the demand pressures described above an economically sustainable system argues for a prudent approach to hospital provision which locates there only that which must be conducted there in the interests of best patient experience and outcomes. Resolving that challenge requires the hospital and its specialists to work with community colleagues to ensure that the integrated system makes the most efficient use of hospital resources. The hospital should also take a lead in environmental sustainability given its health implications. The current structures and services have limited potential to address this important agenda.

Understanding the benefits of a Learning Health System

Although we can confidently predict that there will be change, its precise nature is harder to judge. To avoid obsolescence from the 'wrong' choices being made, and to foster the ability to respond to emerging health challenges, trends and new technology, it will be critically dependent on a health care system that can collect data; integrate and analyse this rapidly; implement necessary change in response; and evaluate outcomes in a continuous cycle. This demands that the plans for a transformed health delivery system embed what has been described as a 'learning health system' as a core priority, with the C&V UHB acting as the anchor analytic hub to drive adaptation and continuous quality improvement as well as generating data for research to drive medical innovation

Implications of the Case for Change for the Hospital of the Future

To rise to this agenda the nature and role of the hospital within the wider integrated care system will need to evolve along the following lines:

- Working with community providers and commissioners of care the future hospital should become an anchor institution supporting the aims of the wider integrated health and care system, leveraging its specialist expertise and technologies to that end. A crucial role will be to facilitate better risk stratification of patients to aid the right channelling and most appropriate use of hospital and community resources consistent with health policies. Technologies to support stratification and decision making will become increasingly important (e.g. 'omics, remote surveillance wearables, remote support and consultation, decision aids and selfcare apps).
- Implicit in the Anchor role is the concept of an 'Analytic Hub' that can link various data sources, analyse them and derive insights to drive process efficiency, better integration, continuous quality improvement, and adaptability. The Hub is the heart of an adaptive 'Learning Health and Care System, future proofing the hospital's contribution to the health and wellbeing of the population it serves.

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Particular considerations for clinical strategy given

UHW2's research hospital status

Whereas the case for change may be common to many hospitals and stimulate the changes in nature and role described above, as a research intensive University Hospital UHW2 has the potential to address the challenges and opportunities and amplify its contribution to the health and wealth of the population of Wales in novel and exciting ways. We describe below how UHW2 as a 'University Hospital of the Future' can contribute to that agenda.

UHW2 as the University Hospital of the Future

The overriding purpose of the Future University Hospital will be, as is now, the delivery of outstanding specialist care coupled with the generation of new knowledge and insights into disease mechanisms, their diagnosis and treatment, and the education and training of healthcare staff. In the case of UHW2 it will also embrace the hospital's role as a tertiary provider and 'University Hospital for Wales'

Newer functional roles to sub-serve the research mission of the University Hospital will include:

- i. The generator, collator, curator and analyser of data on the population it serves; use of such data to fuel a 'learning health system' approach to continuous quality improvement referred to above but also generate data for primary research purposes
- ii. Accelerated, monitored or trialled access to medical innovation, addressing unmet clinical need faster and safely. It is anticipated that this will happen in specialist centres with the requisite research and regulatory science skills and data system architecture
- iii. Leading on and applying 'precision prevention' approaches to complement public health measures to move from a disease-based focus to a key role in the sustenance of health that takes full advantage of modern medical science and specialist expertise
- iv. Training a workforce equipped to support these functions as well as the evolving needs of the NHS in Wales
- v. Leveraging its specialist expertise to lead on the development of risk stratified pathways and their technological enablement
- vi. Generation of economic value through fair commercial relationships that share risk and reward and are designed to sustain public trust. As well as driving up GVA in the local economy growth in the life science and digital sectors will stimulate demand for STEM qualifications and act as a magnet for graduates with these skills

Naturally, there are challenges associated with this new interpretation of the Future University Hospital, these include:

- i. Playing a full part in an integrated care system relies on the maturity of the wider system and an overarching planning and resourcing model that facilitates and incentivises all partners and sectors to synergise their efforts
- ii. Given the importance of data from multiple sources the digital maturity and interoperability of the wider system will be critical determinants of success. An interoperable Electronic Patient Record (EPR) that is in use across the system is a necessary but not sufficient requirement
- iii. Postgraduate Medical Education and Training is currently not best designed to support the needs of the research hospital and the generation of future clinical academics nor the emergent needs of specialists acting to support the wider integrated care system. The standards set by the Royal Colleges do not fully embrace these needs.
- iv. Profound workforce shortages and inadequate preparation for the future role of the hospital demand curriculum redesign, the development of new clinical professional roles and extensions to scope of practice that optimise the use of experiential learning.

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- v. Securing and sustaining public trust with patients as co-producers of new knowledge

In order to rise to these challenges, UHW2 will need to:

- i. Devise a joint clinical academic strategy with the University of Cardiff for both research and innovation, and healthcare education. The research strategy should recognise constituent strengths and optimises alignment and provides the foundational relationship along with industry partners to create a vibrant life science campus and network partnership. This might be best expressed as cross cutting domains to secure greater engagement rather than the classical historical model of organ specific specialisms or academic disciplines. It is well recognised that interdisciplinarity and intersectoral collaboration generates more impactful insights than uni-disciplinary or single sector approaches.
- ii. Appreciate that patients are the source of data upon which the research mission depends and foster an expectation that every (willing) patient is a research patient. Building and sustaining the public's trust in that mission requires a well-developed public engagement strategy that gives citizens true agency in the process and prioritizes research which is relevant to their needs. Particular care is required in use of data and the sensitivity around commercial partnerships
- iii. Reinterpret the role of UHW as the anchor institution in a wider integrated care system to the concept of a wider 'Academic Health Science System' in which the well evidenced benefits of academic engagement in terms of patient outcomes pervade the whole system and the relevance, reach and impact of medical innovation is optimised
- iv. Create a Data hub and analytic 'sidecar'. By combining linked clinical and demographic data from primary and secondary care with physiological and biological including 'omic data the value of these data resources will be greatly enhanced
- v. Develop the work force for the new ways of practising medicine, seizing the post graduate medicine initiative
- vi. Develop a robust, trustable commercial interface, sub-serving the life science aspirations of Wales
- vii. Maximise the impact through wider partnership with the health and academic institutions across Wales (for example, Life Sciences Hub Wales, to mirror the success of the Northern Health Science Alliance in England) and with elite institutions within the UK and internationally.

Developing the Clinical Strategy for the Programme Business Case

Our strategy framework

As noted in the Introduction, to meet the needs of the PBC we have developed a set of visions and principles for services in the new UHW2. These will provide a framework for the more detailed model of care development required for the Outline Business Case. They will also act as a guide to the clinical pathway development work the Health Board is undertaking through its Shaping Our Clinical Services (SOCS) Strategy.

Our approach

Our work has comprised 3 stages:

- i) Preparation of background material on the key influences on clinical strategy
- ii) Selection and delivery of 5 strategy workshops covering Urgent & Emergency Care, Long Term Conditions, Diagnostics, Elective Care & Women's and Children's Services
- iii) Synthesis of points emerging from the background material with key points emerging from the workshops to confirm a vision, principles, out-of-hospital and in-hospital functions, and key planning considerations for each of the 5 service areas.

We discuss i)-iii) in more detail below.

Background material

We prepared our background material along 4 themes:

- Understand the current position of the Health Board for each of the 5 areas of service. This involved reviewing the current service portfolio, consideration of operational performance and key challenges, and reflection on existing change and innovation plans
- Policy review: to ensure our thinking is consistent with
 - National policy – The Wellbeing of Future Generations Act, The Social Services and Wellbeing Act, Together for Mental Health
 - Prudent Healthcare – fitting the needs of service users, avoiding ineffective healthcare, preventing waste and harm
 - Local Plans – Shaping our Future Wellbeing, Shaping our Future Wellbeing in the Community, Shaping our Future Clinical Services, Area Plan for care and Support Needs 2018-23
- Review of science and technology drivers according to readiness, health impact and adoptability in the next 5-10 years. This led us to conclude that 5 specific 'platform technologies', as opposed to discrete diagnostic or therapeutic advances were most relevant:
 - Remote consultation
 - Remote surveillance and monitoring
 - Decision aids

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- Machine Learning and AI
- Precision diagnosis, prognosis and treatment
- A sense of emerging best practice in each of the 5 hospital service areas, shaped to UHW as a major university hospital with a commitment to tertiary service provision, research, development and innovation, and a growing partnership with the life sciences industry.

Selection of service areas and workshop delivery

The Cardiff & Vale Health Board endorsed the selection of the 5 service areas because:

- They cover the bulk of UHW services, both secondary and tertiary
- They cover the full range of interfaces with primary care
- They reflect areas of greatest demand
- They cover health priorities such as frailty and mental health
- They address the weaker parts of the UK health system such as diagnostics which is critical for risk stratification and integrated care

Each of the 5 workshops brought together “external experts”, from Grant Thornton and Academic Health Solutions, with “local experts and leaders”. The average attendance at each workshop exceeded 50. Attenders were mainly clinical, drawn from primary, secondary, and tertiary services.

The background material contained propositions about implications for the future planning of each service area. This was used to stimulate debate and identify particular issues and nuances which needed to be built into clinical strategy. Some issues e.g. digital maturity and strategy, workforce strategy, integrated working, were common across the workshops. The output from each workshop covers:

- the vision and principles for each area of service
- key emerging trends and policies for each service
- specific in-hospital requirements
- specific out-of-hospital requirements
- Implications for tertiary and quaternary services
- Implications for the future university hospital and UHW2 Campus development

The outputs for clinical strategy and modelling from each workshop are set out below.

Strategy for the 5 blocks of care

This section outlines the strategic implications at a high-level for each of the core blocks of care. As a representation of the major constellation of services that need to be considered for UHW2, inevitably there are common themes that span the five blocks regarding the wider transformation of services, implications for tertiary and quaternary services and the implications for the future university hospital and UHW2 campus development. To avoid repetition, these considerations are outlined after the strategic implications for each of the five blocks have been described.

Women and Children's Care

A vision for Women and Children's Care

"The provision of services for women and children will embrace a life course approach acknowledging the particular vulnerabilities at different life stages and the health-sustaining opportunities this approach represents. The enduring disadvantages that women face in terms of access to services that accommodate their needs and preferences will be addressed and the growing health needs of children and adolescents, including transitional care, met.

The focus for maternity services will be on developing excellence in obstetric, maternity and neonatal services by providing woman-centred, family friendly, personalised care which enables patient choice on the location and method of birth and provides continuity of care across acute, community and other services. Supporting women in the choices available to them prior to, during and after pregnancy is central to this philosophy and will be delivered by offering safe, effective and evidence-based care for women and their families.

In doing so the UHW2 will optimise its contribution to the integrated care system whilst ensuring provision of the highest quality is confined to activity that is most appropriately conducted in that setting".

It will consider the following **emergent trends and policies** in Women and Children's care:

- Services for women and children will embrace a life course approach acknowledging the particular vulnerabilities at different life stages and the health sustaining opportunities this approach represents.
- Provision of woman-centred, family friendly, personalised care which enables patient choice on the location and method of birth and provides continuity of care across acute, community and other services.
- Embracing the trend towards medical and less invasive (i.e. surgical) interventions.
- Clear identification of risk status post pregnancy and contributing to the design and application of preventive care pathways (e.g. for gestational diabetes, hypertension, mental health) with established criteria for referral to specialist services.
- Avoiding paediatric admissions by applying specialist expertise to risk stratification, care pathway refinement, remote consultation and triage in support of population health management, including facilitating access to other services such as CAMHS.

In hospital support

Flowing from the above there is a range of **considerations for in-hospital functions:**

Women's Services

Menstrual health:

- Guiding the development and application of patient held Apps
- Co-developing toolkits for primary care management and referral criteria
- Embracing the trend towards medical and less invasive interventional management as opposed to surgery
- One-stop services combining relevant investigations and where appropriate interventions, for example contraception and menopause services
- Optimal use of remote consultation/triage for new and follow up patients

Health issues heralded by pregnancy

- Clear identification of risk status post pregnancy and contributing to the design and application of preventive care pathways (e.g., for gestational diabetes, hypertension, mental health) with established criteria for referral to specialist services.

Menopause and post-menopause

- Rapid access services for suspected cancers
- Establishing in conjunction with primary care referral thresholds for cancer, cardiovascular disease and maintenance of bone health that take account of social, demographic and 'omic determinants and use decision aids
- Monitoring service access to address inequalities and to ensure the management of women with suspected cardiovascular disease mirrors that available to men

Children's Health

Strengthening community support

- Avoiding admissions by applying specialist expertise to risk stratification, care pathway refinement, remote consultation, and triage in support of population health management, including facilitating access to other services such as CAMHS.
- Leading on the development and monitoring of risk stratification protocols, referral criteria, threshold alerts and integration of remote monitoring and surveillance.
- Secondary care input (either in person or virtually) to family care hubs to support prevention and anticipatory care including liaison with schools, nutrition, and dental services.

Urgent care

- Continued use of direct GP referral & telephone triage.
- Single front door through ED with specific areas for children and young people, such as children's ED spaces and resus area.
- Access to paediatric team for children and young people attending urgent care.
- Paediatric assessment unit (PAU) to be located in close proximity to ED

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- Provision of safeguarding suite for vulnerable children.

Elective care

- Separate outpatient area within main outpatient department for children and young people.
- Making effective use of virtual consultations (within safe parameters to reflect vulnerable children and safeguarding issues).
- Outpatient facilities at main site and satellite sites
- Paediatric inpatient ward for admissions.
- Potential opportunities to grow day case surgery for paediatrics with agreement from the relevant surgical specialists.

Transition

- Development of a specific service offering for adolescents and teenagers including youth friendly spaces, peer support and self-management skills.
- Use of technology to secure engagement for this cohort of patients, self-selection platform for appointments, results monitoring and virtual consultation.
- Establish clear pathways and protocols for transition into adult services, based on patient need rather than arbitrary age thresholds.

Antenatal Care

- Leveraging technology to enable 'intelligent risk' stratification, remote monitoring and expert support and 'personalised' pathways and accommodate medical problems in pregnancy.
- Providing antenatal care away from the acute setting in the majority of cases, including via the use of virtual technologies (where appropriate) and apps.
- Development of new care delivery models such as midwifery group practice and group antenatal care.
- Providing an holistic approach to pre-existing co-morbidities such as pre-pregnancy diabetes care and input from medical specialists as required.
- Supporting the needs for vulnerable groups such as those with alcohol, drug and other substance misuse addictions, mental health and other social needs requiring specialised midwifery input.
- Providing ambulatory monitoring and intervention to support women who have deteriorating signs and symptoms antenatally.
- Ante-natal ward which include induction service and beds for complex antenatal issues.

Birth

- Leading on the development of choice of place of birth and mode of delivery.
- Aiming to minimise avoidable c-section rates (within the context of choice).
- Supporting safe and early discharge
- Midwife-led units and potential expansion of midwife-led units across the wider integrated care system.
- Dedicated labour ward with standalone birthing unit with complementary facilities such as additional birthing pool.
- Increase home birth rates

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- Development of a dedicated bereavement suite for mothers, partners and their families.

Postnatal

- Community follow-up of mother and baby, with secondary care input 'at distance' if required.
- Intelligent ongoing monitoring of health problems revealed by pregnancy and contributing to the design and application of preventive care pathways (e.g., for gestational diabetes, hypertension, mental health) with established criteria for referral back to specialist services.
- Development of inter-operable electronic maternity record which can be accessed by mother and primary and community care, and other agencies as appropriate.
- Establishing greater peri-natal mental health support.

Out of hospital support

Women's Services

- Adopting a life-course approach to women's health that encourages ongoing surveillance and proactive management. These services may be delivered directly by C&VUHB, or in partnership with the wider integrated care system.
- Moving appropriate procedures to the community and optimising the capability in community monitoring during reproductive years.
- Ongoing management of future health issues heralded by pregnancy (e.g., gestational diabetes, hypertension) including screening for re-emergent disease

Paediatrics

- The analytic hub in UHW2 will act as a “nerve centre” to inform decision-making across the integrated health and care system
- Participation in ‘care bridges’ or equivalent, optimising community nursing services that bridge the gap between hospital and home and helps coordinate ongoing community support.
- Provision of community hospital at home team of skilled paediatric nurses to support early assessment in community and treatment under direct consultation.
- Development of multidisciplinary working to include acute care, community care, health visiting social care, public health, mental health (CAMS) and learning disability and other key agencies.
- Provision of other services elsewhere in the system, such as family health centres which avoid the need for patient to be involved in an acute setting.

This will be **digitally enabled** by:

- Patient apps and telephone advice
- Thresholds for attendance / escalation protocols
- Access to a patient record which is interoperable across the health and social care system
- An immediate discharge record and co-ordinated community provision
- Crisis avoidance through AI-informed targeted intervention e.g. for hypertension in pregnancy
- Remote consultation to avoid unnecessary attendance at hospital
- Analysis of attendances to refine processes and optimise appropriateness and equity of provision

Diagnostics

A vision for Diagnostics

“The provision of diagnostic services will span multiple settings, but critically will enable patients to receive the right care, in the right place at the right time as part of a care pathway that is integrated and personalised and increasingly ‘precision’ in nature.

In the hospital diagnostic services will be largely centralised to achieve optimal efficiency and productivity. In the community, rapid diagnostic capacity will enable faster, more efficient diagnoses and facilitate the development of personalised care packages that give patients a choice as to the type of care they receive.

Digital enablement will also enable integration with community provision and provide real time data flows to support adaptability to changing demand, continuous quality improvement and the rational adoption of new technologies to further enhance the model of care”.

It will consider the following **emergent trends** in diagnostics:

- A growing recognition that diagnostics and prognostics are key to risk stratification, integrated care and precision medicine
- Centralisation of pathology hubs and imaging modalities *but...*



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- Need for point of care diagnostics, particularly in primary care and easy access to community-based routine diagnostic services
- Growth in image-guided therapy (interventional radiology, surgery, precision targeting of energy sources etc)
- Use of AI/machine learning to interrogate images and inform demand management and channelling
- Digital pathology
- Newer diagnostic modalities (fMRI, 'omics, remote physiological monitoring etc)
- Workforce challenges – use of extended roles (endoscopy, ultrasonography)
- Recognition that the diagnostics sector is underdeveloped in the UK, as revealed by Covid-19, representing an opportunity for strong clinical academic alliances
- Recognition that radiologists and pathologists are a key part of a multidisciplinary team involved in clinical decision making rather than a service
- A recognition that digital maturity and interoperability will be key to realising the potential of diagnostics

In hospital support

Flowing from the above there is a range of **considerations for in-hospital functions**:

Patient-centred diagnostic services

- Delivery of diagnostic services that are convenient and optimise the patient experience.
- Use of non-hospital facilities such as the Wellbeing Hubs and community/primary care for appropriate modalities across all diagnostic services so patients can access services as close to home as possible.
- Development of new pathways which reduce time in hospital settings such as 'straight to test' initiatives e.g. for MSK or endoscopies

Pathway process value engineering

- To lead on pathway redesign to reduce complexity in the pathway and multiple handoffs.
- To provide active management of the patient waiting list to improve the time to test or procedure
- To ensure the 'sweating of assets' so that maximum benefit is gained from investment in new diagnostic equipment and estates
- To make increased use of extended roles, for example in radiology which will change the way radiographers contribute to patient management and service delivery.
- Developing standard referral protocols and reporting for common diagnostic tests and procedures.
- Applying machine learning/AI to interrogate diagnostic outputs e.g. images or results to expedite reporting and extract further pathological insights.
- Ensuring full access to the diagnostic outputs and results both within and outside of the hospital. System interoperability will be key.

Diagnostic modalities

- Access to conventional modalities: ultrasonography, plain film x-rays, MRI, CT, PET and PET-CT.
- Adoptions of newer modalities and applications; fMRI, digital pathology, intra-operative imaging (see elective surgery workstream output).
- Anticipated activity growth in interventional radiology – need to ensure facilities and workforce are in place to capitalise on this growth..
- Continued growth in endoscopy activity nationally – need to ensure facilities and workforce are in place to respond to this growth.



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Interplay with other services

- Working with other services to reduce the number of steps within a patient pathway.
- Playing a full role in patient management as part of multi-disciplinary team approach.
- Development of enhanced reporting to support primary care and secondary care clinicians in deciding what action to take after diagnostic tests and procedures
- Supporting the drive to reduce the number of procedures and investigations of limited clinical value.
- Living with cancer and ongoing cancer surveillance will increase demand for diagnostic services.

Out of hospital support

The vision and principles developed here create a range of opportunities for the UHW2 Diagnostic Service to support **out-of-hospital provision**. These will support the further development of UHW's Emergency Community Specialty and service developments set out in the Community Business Case.:

- The analytic hub in UHW2 will act as a “nerve centre” to inform decision-making across the integrated health and care system
- This will include patient and carer decision-making through e.g. remote surveillance and monitoring through the digitally-enabled resources described earlier – the patient as “agent” of their care
- Specialist expertise will be available to primary and community care colleagues to inform risk stratification, care integration and pre-emptive treatment, to sustain patient health in the community (e.g., by avoiding exacerbations of underlying conditions)
- Specialist expertise will support GP and Wellbeing Hub diagnostics, including point-of-care testing, so that clinical decision-making can occur prior to hospital presentation

This will be **digitally enabled** by:

- AI enabled risk stratification and intelligent alerts
- Machine Learning/AI image analysis
- Digital pathology

Urgent and Emergency Care

A vision for urgent and emergency care is set out as follows:

“Urgent care services will provide exemplary care for patients with urgent, life threatening conditions and accidents, and will channel those presenting with other needs to complementary parts of the system – either in UHW2 or community facilities as appropriate.

UHW2 will play its full part in limiting the need for urgent care, using its expertise to support those at risk of attendance by:

- i) Guiding risk stratification, escalation thresholds and pathway refinement for those with long term conditions, and
- ii) Intelligence gathering and analytics on attendees and contributory factors to inform ongoing support”.

It will consider the following **emergent trends** in urgent and emergency care:

- Centralisation of certain services e.g., major trauma
- Bolstering community provision, (e.g., 24/7 primary care, MIUs, UTCs, MDT crisis avoidance) to ensure only those needing hospital resources attend
- Flexing the integrated care system, informed by data analytics, to ensure the most appropriate attendance
- Point of care diagnostics to rule out need for attendance
- Emergency remote consultation access
- Diagnostics (e.g. imaging) deployed earlier in the clinical decision pathway to expedite emergency management
- Factoring in pandemic resilience and service flexibility, including the use of technology to manage patient flow and hospital zoning strategies to separate infected and non-infected channels
- Out Hours Adult Mental Health Emergency Service and CAMHS provision to ensure only those needing hospital resources need attend
- Utilising the role of paramedics to deliver urgent care in the community and enable effective liaison between paramedic services and emergency medicine

In hospital support

Flowing from the above there is a range of **considerations for in-hospital functions**:

- There will be strong **separation between infected and non-infected channels**. The learning from the current pandemic is that this is necessary for Covid management but has also created a general benefit at UHW in a significant drop in MRSA, C Diff and other infections and should thus be consolidated in the design of UHW2
- **Triage should be underpinned by earlier use of diagnostic modalities**, including prior to hospital presentation. This connects to the need for growth in point of care testing (POCT) in primary care, and the availability of diagnostics in the Wellbeing Hubs, which we discuss under Diagnostics
- The “**Urgent Care Village**” concept, in which a range of services is available at the front door to support clinical decision-making, should be developed for UHW2. This will define the core of services grouped around the Emergency Dept
- There should be clearly **separate routes** through the Village for adults and children. This is important for the psychological safety, privacy and dignity of children in particular, and will enable supporting services to be grouped effectively
- There should be **rapid access to further diagnostics and emergency theatres** to complete clinical decision-making and to avoid unnecessary holding of patients in the Emergency Department or in inpatient beds
- There should be rapid access to “**hot**” **clinics and observation wards** so that further assessment can be completed without congestion and delay
- Services for challenging client groups – e.g. Mental health crises, drug and alcohol usage, frail elderly – should run in parallel for focused assessment, diagnosis and treatment and the psychological safety, privacy and dignity of all service users
- The Urgent & Emergency Care Services should have access to the Analytic Hub function to accelerate decision making.

Out of hospital support

The vision and principles developed here create a range of opportunities for the UHW2 Urgent & Emergency Service to support **out-of-hospital provision**. These will support the further development of UHW’s Emergency Community Specialty in line with the Shaping Our Future Well Being: In Our Community Strategy:

The analytic hub in UHW2 will act as a “nerve centre” to inform decision-making across the integrated health and care system

- This will include patient and carer decision-making through e.g. remote surveillance and monitoring through the digitally-enabled resources described earlier – the patient as “agent” of their care
- Specialist expertise will be available to primary and community care colleagues to inform risk stratification, care integration and pre-emptive treatment, to sustain patient health in the community e.g. by avoiding exacerbations of underlying conditions
- Specialist expertise will support GP and Wellbeing Hub diagnostics, including point-of-care testing, so that clinical decision-making can occur prior to hospital presentation

This will be **digitally enabled** by:

- Patient apps and telephone advice
 - Thresholds for attendance / escalation protocols
 - Access to a patient record which is interoperable across the health and social care system
 - An immediate discharge record and co-ordinated community provision
 - Crisis avoidance through AI-informed targeted interventions
 - Virtual clinics, including Fracture Clinics
 - Remote consultation to avoid attendance
- Analysis of attendances to refine processes and optimise appropriateness and equity of provision

Long Term Conditions

A **vision** for Long Term Conditions at UHW2 is set out as follows:

“The provision of patient-centred services for those with Long Term Conditions which transcend organisational boundaries, to facilitate a seamless patient experience, both within and outside hospital.

Supported by a single, integrated workforce which works across the whole integrated care system to optimize health and wellbeing and prevent or minimize time in hospital.

The patient will be able to act as agent for much of his/her health and care

The hospital will act as an analytics hub for LTC management, deploying expertise to work with primary care and community services to risk-stratify patients so the location and intensity of their care is appropriate to their needs, supported by remote surveillance and monitoring.

Digital enablement will support integration of services, access to specialist input as well as support patients with their own self-care and management”.

Digital enablement and science and technology will specifically support:

- Remote consultation: specialist support for community-based care; minimising unnecessary face to face follow up
- Remote surveillance: identifying those at risk of decompensation to enable pre-emptive intervention and selfcare
- Machine learning/AI: precision risk algorithms; intelligence-led attendance alerts
- Precision medicine: e.g., point of care ‘omics; big data analytics; digital pathology
- Learning health system analytic hub

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- The role of technology in patient self-management

It will take into account the following **emergent trends and policy developments** in the management of Long-Term Conditions:

- Taking a place-based approach to LTC risk management and planning:
 - Recognition of the social and economic gradient in LTC expression
 - Population health management: Addressing the social, environmental, and behavioural determinants requiring a multi-agency approach
- Needs-led, risk stratification-driven, and outcome- informed
- Integration of processes, workforce and pathways leading to a seamless patient journey and experience
- Promotion and facilitation of self-care
- Developing precision prevention and early detection approaches to complement population-level public health measures
- A recognition of the interplay between mental and physical health and the need for services to address both
- The key role of obesity as a risk factor for most LTCs including cancer and the need for effective means to combat
- A recognition that the concurrence and premature expression of LTCs leads to frailty

In hospital support

Flowing from the above there is a range of **considerations for in-hospital functions and the role of the specialist:**

- Specialist skills will be deployed to help design and deliver risk-stratified pathways working with primary care and community colleagues
- The hospital will have the analytic capacity to inform refinement of pathways as part of a Learning Health and Care System
- Pathways for specific LTCs will be direct between community and hospital elements, avoiding processing (and delay) through Emergency Departments or Assessment Units
- The hospital will accelerate the evaluation and adoption of precision diagnostics, surveillance tools, supportive Apps, and precision therapies in support of the vision, consistent with its role as a research-intensive University Hospital
- The evolution of the roles of Primary and Community Care Practitioners as case managers, with a focus on prevention, health-promotion and self-care
- Case management should also focus on expectation management for patients, relatives and carers, with particular respect to Palliative Care.

Out of hospital support

The vision and principles developed here create a range of opportunities for the UHW2 Long Term Conditions Specialists to support **out-of-hospital provision:**

- Building on the community pathways already developed in primary care to connect these to secondary care where that will complete service integration, co-designed with MDT and patient input, specifically to advise on risks strata

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and thresholds for escalation of care and the use of technologies and point of care testing to support community colleagues to enable triage, and admissions avoidance as appropriate.

This will be **digitally enabled** by:

- Patient apps and telephone advice
- Thresholds for attendance / escalation protocols
- Access to a patient record which is interoperable across the health and social care system
- An immediate discharge record and co-ordinated community provision
- Crisis avoidance through AI-informed targeted intervention e.g. for Frail Elderly, Long Term Conditions
- Virtual clinics, including Fracture Clinics
- Remote consultation to avoid attendance
- Analysis of attendances to refine processes and optimise appropriateness and equity of provision

Elective Care

A vision for Elective Care is set out as follows:

“Hospital elective care that results in optimal outcomes, healthcare value, patient experience and length of stay, and integration back into the community with minimum adverse health legacy.

The sustenance and development of tertiary services reflecting the hospital’s special expertise.

Development, evaluation and adoption of novel advanced therapies including pre-emptive treatments as these precision prevention tools come on stream.

Rapid diagnosis and optimised interventions secured through an active partnership with patients and their primary care and community services”

In hospital support

Flowing from the above there is a range of **considerations for in-hospital functions**:

Pre-referral:

- Reduce the need for referral by improving GP and hospital connectivity, such as use of advice and guidance.

Decision to operate: outpatient assessment process:

- To lead the development of standardised referral criteria.
- To expedite the assessment process via virtual triage and one stop provision.
- To integrate public health data and Local Authority needs assessment data to ensure equality of provision.
- Discharge planning to commence on decision to operate.

Pre-surgery assessment protocols and processes:

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- Actively shifting to virtual assessment and community pre-tests where possible.
- Advise community providers on enhancing patient pre-operative functional reserve to improve fitness in the post-operative period.

Elective admissions process:

- Reduce or where possible eradicate patient waiting to improve overall experience.
- Streamline the check-in process, utilising technology to enable remote check-in.

Elective and emergency surgery channels:

- Dividing surgery channels into infected and non-infected to enable elective surgery to continue during a pandemic.

Optimising length of stay:

- Adopting a comprehensive approach to the safe minimisation of the length of stay including:
- Ensuring day cases are discharged at the appropriate time so as not to become inpatients.
- 'Discharge to assess' initiatives to include use of multidisciplinary teams.
- Participation in 'Care Bridges' and community collaboration.
- Referral to other community-based services where appropriate.
- Optimising criteria-led, anticipatory discharge involving MDTs.
- Risk stratification of patients to determine the earliest appropriate discharge time.
- Optimising theatre processes to achieve maximum efficiency and shorten post-operative recovery period.

Effective and efficient use of theatres:

- Theatre use optimisation programme to achieve most productive safe and effective use of facilities.

Intraoperative and postoperative management to minimise adverse long-term sequelae:

- Utilising real time data and analytics to inform clinicians of patient status (e.g., brief periods of hypotension) and manage outcomes proactively.

Pre 'Last resort' care:

- For urgent life-threatening conditions and accidents leading to resuscitation, rapid assessment, and treatment.

Out of hospital support

- Participation in pre-referral and pre-assessment processes. Assimilating clinical and objective data via pre-testing and remote monitoring in order to ascertain the patient's overall health status
- Anticipatory approach to minimising operative risk and optimising post-op recovery. Facilitating pre-op fitness and pre-rehabilitation informed by the patient's status and planned procedure
- Facilitating early discharge by participating in criteria-led, anticipatory discharge, that limits length of stay and the safe minimisation of bed days.
- Establishment of a community nursing service that 'bridges' hospital to home and helps coordinate ongoing community support and rehabilitation care.

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This will be **digitally enabled** by:

- Patient apps and telephone advice
- Thresholds for attendance / escalation protocols
- Access to a patient record which is interoperable across the health and social care system
- An immediate discharge record and co-ordinated community provision
- Crisis avoidance through AI-informed targeted intervention
- Remote consultation to avoid unnecessary appointments at the hospital
- Analysis of attendances to refine processes and optimise appropriateness and equity of provision

Wider transformation implications

Detailed work on the sizing of facilities and services and the calculation of workforce numbers will be undertaken at the Strategic Outline and Outline Business Case stages. For now, key change implications across the five blocks of care need to be emphasised:

- The vision and principles for the five blocks set out here will not be secured without the achievement of **digital maturity** we outlined at the beginning of this chapter. Realisation of the Health Board's digital strategy is an essential prerequisite for which the transformation timetable has effectively started
- Elements of the transformation are already in place through initiatives such as Consultant Connect and the virtual development of the MDT principle
- The healthcare workforce across Cardiff & Vale will need to develop a strong **capability in data management and analysis, and clinical decision-making to the top of its licence** e.g. for Allied Health Professionals working independently in Wellbeing Hubs. This will require a transformation for which the timetable has also started
- There will be an understandable tendency to see this as a matter of **workforce growth**. While that is of course a consideration it will need to be balanced by the opportunity for **task redistribution** and different ways of working as science and technology – noted above - make this possible
- What we set out here reconciles to the Community Services Business Case and the approach to implementation of Shaping our Future Wellbeing. Community facilities will need to be part of an interoperative digital platform. **Community workforce, including primary care practitioners**, will need to develop data management and analysis and clinical decision-making capability alongside their hospital colleagues.

A critical requirement across the health and social care system will be **a common risk appetite** in the delivery of services. All organisations must develop a common approach to thresholds for treatment and care, so the system operates as a single, integrated entity.

Implications for tertiary and quaternary services

UHW provides a range of tertiary and quaternary emergency services across the 5 blocks, inter alia in Cardiology / Cardiac Surgery, Liver Disease, Lung Disease (e.g. Cystic Fibrosis), Neurosciences (e.g. Neuropsychiatry), Haematological (e.g. Sickle Cell) and Genetic disorders. We note that a programme of work is under way to develop the network for tertiary and quaternary services across South and West Wales. This may have some implications for service distribution which can be

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factored into more detailed planning at the SOC stage. It is also important at the SOC stage that facility and service planning takes account of the need for distinct pathways for different elements of service that we have referred to elsewhere. This will legislate for unnecessary congestion of secondary and tertiary services, with commensurate delays and cancellations in service delivery.

In the meantime, we have noted the opportunity to improve digital links between hospitals to offer a non-hospital solution for elements of the tertiary pathway. This can form part of the digital transformation we describe above. Similarly, we anticipate tertiary service clinicians will be as keen to develop their data and analytics capability as their secondary care colleagues.

Implications for the future university hospital and UHW2 Campus development

Looking back at the vision for each of the blocks and the overall CVUHB vision to be a top 10 health system globally, we see opportunities for UHW2 to act as a catalyst for university hospital development. These range across Education & Training and Research, Development, and Innovation and will require the parallel development of an aligned academic strategy with the University of Cardiff:

- Gaining insight to redesign the **curriculum for clinical undergraduates** to prepare them for fully digitally enabled health care
- Changing the focus of education programmes e.g. to take account of the **life course approach** and place sufficient emphasis on later years and associated frailty
- Leading on the **convergence of “omic” and real-world data sets** to facilitate precision prevention, early detection and early intervention – which would accord with A Healthier Wales and Shaping our Future Wellbeing
- Building analytics for Long Term Conditions into **postgraduate training** for Medicine, and Masters and PhD programmes for Nursing and Allied Health Professionals
- Co-ordination of **rapid and adaptive Phase 3 trials** to address urgent clinical priorities following pre-clinical and early-stage clinical studies
- **Partnership with life science companies** on diagnostic and interventional device development, commensurate with the work of the Medicity and the development of a life sciences hub on the UHW campus
- Further develop **the partnership with Cardiff University** (across a range of disciplines beyond Biomedicine e.g. Engineering and Physical Sciences)

Conclusion

Addressing the challenges above will enable UHW2 to stimulate the change necessary to operate at the cutting-edge of healthcare delivery as the *Research Hospital of the Future*, amplifying its contribution to the health and wealth of the population of Wales in novel and exciting ways. It will become an international exemplar for how the *Research Hospital of the Future* will function, operating as a central analytics hub that synthesises and triangulates patient and system level data. In doing so, UHW2 will remain agile and help safeguard against obsolescence, allowing it to stay relevant for the next 20 to 30 years, while providing the people of Cardiff and the wider ecosystem with high quality patient centred care, that preserves choice, and delivers care in the right setting at the right time by the right healthcare professional.

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Additional material for Lidia and Rhiannon's consideration

The proposed clinical strategy sets out how UHW2 will function as a research institution, a tertiary centre, and a component of the wider healthcare ecosystem. To ensure that this ambition is understood, the following is a summary vision of how UHW2 can operate at the cutting-edge of healthcare delivery as the *Research Hospital of the Future*.

UHW2 will not function as a centralised command and control centre in which all services are delivered under one roof. Instead, it will become an international exemplar for how the *Research Hospital of the Future* will function, operating as a central analytics hub that synthesises and triangulates patient and system level data. As such, every patient will fulfil the role of a *Research Patient*, with the data they generate on their clinical journey, captured and assimilated to advance the wider research agenda and improve care outcomes.

As a central data and analytics hub, UHW2 will facilitate the development of what is termed a '*Learning Health System*'. A Learning Health System is a socio-technical infrastructure that aligns science, informatics, and culture for continuous improvement and innovation, with best-practice embedded in the delivery process and new knowledge (and data) captured as a bi-product of the delivery experience. Adopting the principles of a Learning Health System will enable UHW2 to deliver a set of high value services within a wider health and care ecosystem.

Essential to this, is the role that *innovative technologies* will play in improving quality, efficiency, and the patient experience, while providing the foundations upon which a Learning Health System can be developed. Fundamental to this, is the role *platform technologies* (such as Electronic Patient Records) will have in facilitating system integration and the sharing of data.

To meet these requirements, the hospital's physical estate will need to be built based on a *fundamentally new flexible design*, one that considers future clinical and technical demands while factoring in pandemic resilience. This level of flexibility must also be reflected in the way in which the workforce functions. As an integral part of the Research of Hospital of the Future and the wider Learning Health System, clinicians will operate in a flexible manner in *extended roles*, as well as being directly involved in the data collection and interpretation process. Hardwiring flexibility into both the physical estate and the workforce will enable the ecosystem to remain agile and help safeguard against obsolescence, allowing UHW2 to stay agile and relevant for the next 20 to 30 years.

As part of this new ecosystem, UHW2 must ensure that its strategic and clinical outlook aligns with that of a wider integrated health system and overarching policy initiatives while providing high quality patient centred care, that preserves choice, and delivers care in the right setting at the right time by the right healthcare professional.

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Appendices

Appendix 1: Implications considered for each model of care for UHW2

Implications for the model of care for UHW2 from our preparatory work include:

UHW2 will be the anchor institution and analytic hub for the integrated care system:

- Leveraging specialist expertise to inform risk stratification, care integration, and pre-emptive treatment to sustain health
- Collating and analysing data to drive primary research in conjunction with University partner
- Adopting a Learning Health System approach to continuous quality improvement and process efficiency
- Facilitating the accelerated monitored or trialled introduction of medical innovation, addressing unmet clinical need faster and safely in pursuit of the health system's aims

All of the above are consistent with a vision for a Future Research or University Hospital to which may be added:

- Seeking strategic alignment with University partner and leveraging interdisciplinary strengths beyond biomedicine
- Supporting Wales life science agenda through the creation of strategic alliances with industrial partners, generating wealth and health for the population

Appendix 2: Examples of innovative practice

Examples of innovative practice in Women and Children's services

Women's Services

University College London Hospitals NHS Foundation Trust Elizabeth Garrett Anderson Wing

The Elizabeth Garrett Anderson (EGA) Wing provides comprehensive, high quality care with the latest technology for women and their babies in the areas of gynaecology, maternity and neonatal care. Maternity services offer access to a full range of care options in different settings including home birth, community care, a co-located birth centre, labour wards and two dedicated theatres. The gynaecology service offers both inpatient and outpatient care, whilst the level 3 neonatal unit ensures the safest and highest quality care for babies born at the EGA and from across London.

The service is closely associated with and influenced by the EGA Institute of Women's Health at UCL which has pioneered a life course approach to women's health embracing the prevalent problems at various life stages from early development, through the reproductive years to the menopause and old age with an emphasis on anticipating problems and sustaining health. The EGA has led the UKCTOCS UK collaborative trial on cancer screening and pioneered open foetal surgery for spina bifida and gene transfer techniques, amongst other firsts.

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Children's Services

Integrating Care: Imperial Connecting Care for Children Initiative.

Hospital paediatricians and GPs participating in joint clinics and multidisciplinary team (MDT) meetings in GP practices, a component of an 'Inside-Out' change known as 'Connecting Care for Children (CC4C)'. Cases seen in clinic or discussed at MDT meetings and their follow-up needs. Hospital Episode data: outpatient and inpatient activity and A&E attendance. Patient-reported experience measures and professionals' feedback. In one hub, 39% of new patient hospital appointments were avoided altogether and a further 42% of appointments were shifted from hospital to GP practice. In addition, there was a 19% decrease in sub-specialty referrals, a 17% reduction in admissions and a 22% decrease in A&E attenders.

An example of innovative practice in Diagnostics

Pathology-Flow Cytometry

Cambridge University Hospital NHS Foundation Trust

The Challenge

Pathology in the UK is facing considerable challenges with demand increasing. Consolidating the provision of services into a 'hub-and-spoke' model is expected to deliver sustainable savings and greater flexibility to meet future needs. In this model, the 'hub' laboratories serve as centres for handling specialised and non-specialised analyses across providers and the 'spoke' labs afford the necessary on-site services and capability for the turnaround of essential point-of-care tests. With an ageing population and new diagnostic tests, volumes are expected to rise year-on-year when there are already significant stresses on laboratory capacity, processes and staff. It is unlikely that incremental improvements in current processes will be sufficient to cope with the future system needs.

The Solution

The laboratory team at Addenbrooke's Hospital, Cambridge has demonstrated how a collaborative approach to meeting future needs can help. A new technology: flow cytometry was trialled, involving equipment, which comprised of a sample preparation unit linked to a sample analysis unit. During the trial, the equipment reduced the number of manual processing tasks by 67% and reduced the number of critical error prone steps (errors that could affect the patient) per run by 100% (from 25 to 0) 25.

The Benefits

The sample processing time and in particular the variability in time to results was reduced, alongside significant improvements in sample, reagent and process traceability with a shift from paper to electronic records helping meet KPI and ISO compliance. The solution proposed also freed staff time to focus on more patient-centric care – diagnostics not paperwork

Source: <https://jcp.bmj.com/content/56/2/129.share>

An Example of innovative practice in Urgent and Emergency Care

Evidence review on the effectiveness of different models of delivering urgent care.

The health services research group University of Sheffield undertook independent research funded by the NIHR evaluating the effectiveness of different urgent care models. The rapid evidence review embraced 45 systematic reviews and 100+ primary studies on themes relating to delivery of urgent care, with the aim of assessing the nature and quality of delivery of emergency and urgent care and identifying gaps. Key findings were as follows: 1) Demand - there is little empirical evidence to explain increases in demand for urgent care, 2) Telephone triage - Overall, these services provide appropriate and safe decision making with high patient satisfaction but required clinical skill mix and effectiveness in a system is unclear, 3) extended paramedic roles have been implemented in various health settings and appear to be successful at reducing transport to hospital, making safe decisions about the need for transport and delivering acceptable, cost-effective care out of hospital.

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4)ED – The evidence on co-location of GP services with ED indicates there is potential to improve care. The attempt to summarise the evidence about wider ED operations proved to be too complex and further focused reviews were needed. 5) There is no empirical evidence to support the design and development of urgent care networks.

<https://www.ncbi.nlm.nih.gov/books/NBK327599/>

AI to predict A&E Attendances.

A pilot project run by NHS Somerset CCG and Bering research used AI to analyse and predict which patients might be at risk of needing urgent care. GP's then work with the identified patient to get the risk reduced. The AI tool presents analysis as a complexity score on a percentage scale, the score being related to underlying health conditions and contributory factors (such as high bp, smoking etc). <https://www.swahsn.com/wp-content/uploads/2016/08/Bering-Limited-SBRI-Healthcare.pdf>

An Example of innovative practice in managing Long Term Conditions

Unlocking the potential of self-managed long-term conditions.

The Health Foundation assessed the evidence for the effectiveness of a range of approaches the NHS could use more often to support patients to better manage health conditions (these include, health coaching, self-management support through apps, social prescribing initiatives, and peer support through online communities) and that through better management, the biggest opportunity to reduce avoidable use lies in urgent care. One estimate, is that if patients who are least able to manage condition could be supported to manage condition as well as the most able then the impact on the NHS could be as large as a reduction of 333,000-436,000 emergency admissions per year.

<https://www.health.org.uk/sites/default/files/Reducing-Emergency-Admissions-long-term-conditions-briefing.pdf>

Examples of innovative practice in Elective Care

Pre-admission assessment – James Paget HFT vulnerable patient initiative to limit last minute cancellations.

Before the VIP pathway was introduced at JPUH, operations on vulnerable patients were often cancelled at the last minute because patients were overcome by anxiety during the anaesthetic phase. There were also high 'did not attend' (DNA) rates. The subsequent delays directly damaged health, cost and efficiency outcomes. To overcome these issues the James Paget HFT team developed the 'VIP Pathway'. The VIP pathway team comprises a range of condition-specific professionals, supported by the learning disability and/or dementia teams. It ensures that planning, pathway and procedures apply the principles of person-centred care, encompass reasonable adjustments and provide a seamless patient experience. It closely collaborates with patients, relatives and carers (formal and informal), as well as specialist, tertiary and acute care staff, and primary care and community services.

At induction, all JPUH staff receive training in assessing the needs of patients with learning disabilities, autism or dementia. Patients are usually identified as needing reasonable adjustments when they attend an outpatient clinic or go onto the waiting list for surgery.

<https://www.nursingtimes.net/clinical-archive/perioperative-nursing/a-vip-pathway-for-vulnerable-people-receiving-elective-surgery-17-09-2018>

Improved GP access to specialist expertise (including electronic referral).

Bristol Dermatology provide a Teledermatology service to GP practices in Bristol and North Somerset, Somerset and beyond. This is done through a team of 7 local dermatologists who provide a turnaround time of 24-72 hours for each case. The GP and their team take a history and photographs of the skin problem and send them through a secure online system to the

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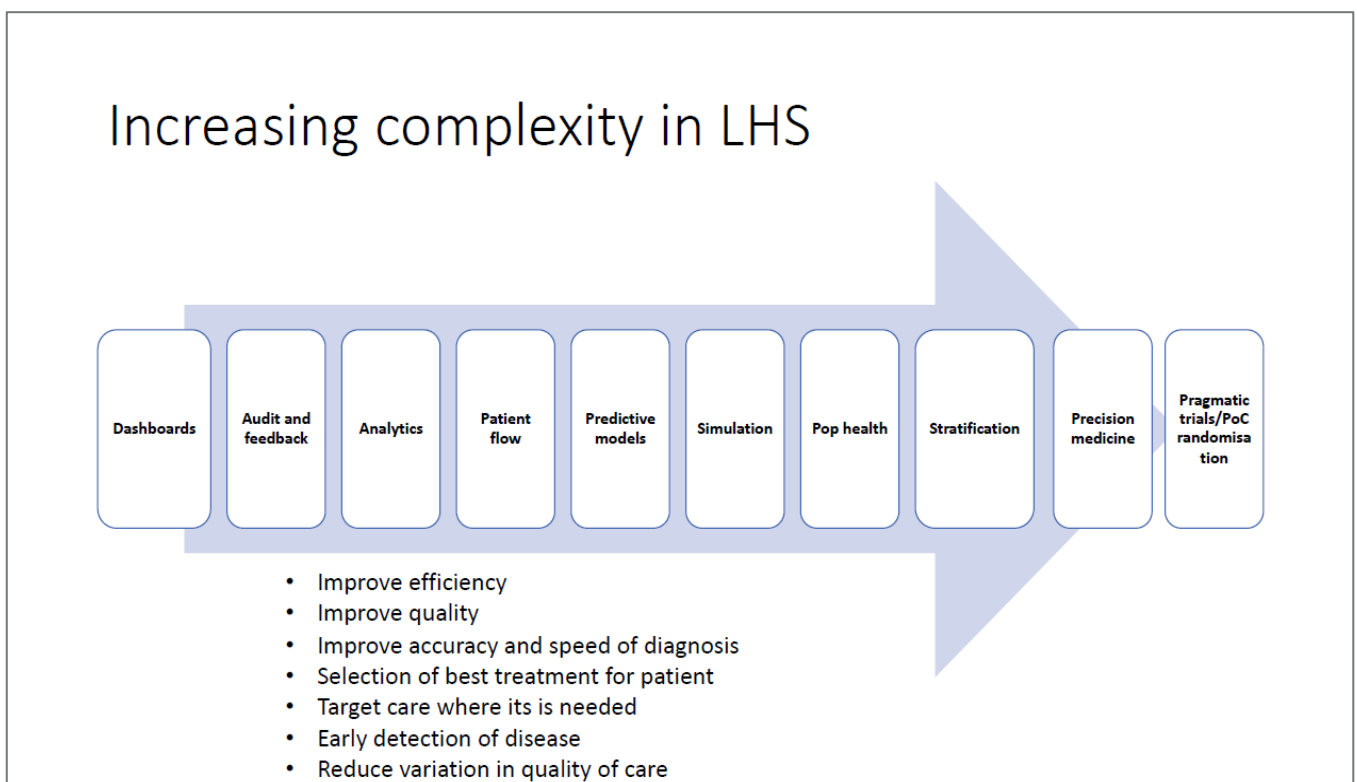
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hospital. These are then reviewed and the consultant provides advice on the management and diagnosis of the person's skin problem.

Annually they review 3-4,000 patients using teledermatology. Approximately 70% of consultations provide guidance on how to care for the patient in the community, usually within the GP practice. The remaining 30% need hospital referral and sometimes this is through the on-call system to ensure urgent assessment. The result has been saving of 45K, 68% of patients managed in primary care and high GP and patient satisfaction.

<http://www.uhbristol.nhs.uk/patients-and-visitors/your-hospitals/bristol-royal-infirmary/what-we-do/dermatology/teledermatology/>

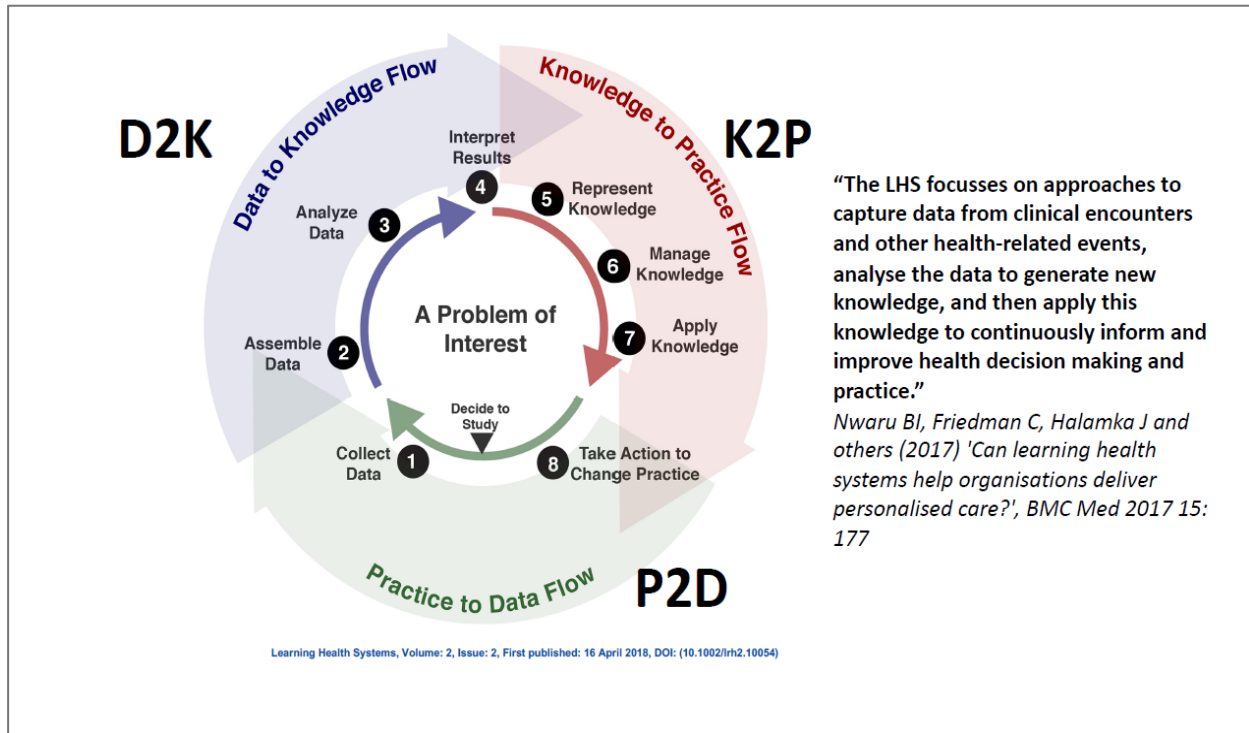
Appendix 3: The Learning Health System



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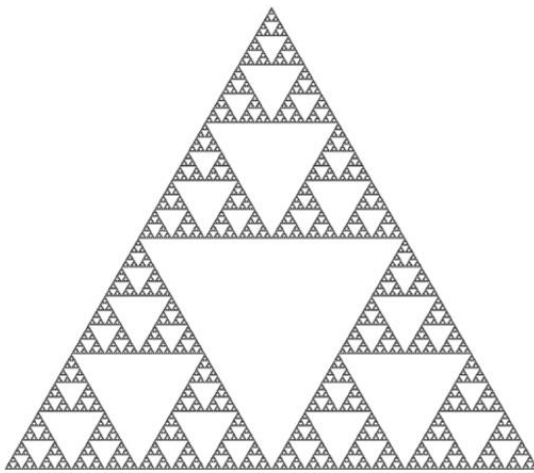
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“The LHS focusses on approaches to capture data from clinical encounters and other health-related events, analyse the data to generate new knowledge, and then apply this knowledge to continuously inform and improve health decision making and practice.”

Nwaru BI, Friedman C, Halamka J and others (2017) 'Can learning health systems help organisations deliver personalised care?', BMC Med 2017 15: 177

Scale



The LHS is Fractal

