The benefits of Virtual Wards: writing a sustainable business case

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Health Innovation Network South London

Contents

Context

This report outlines the benefits of Virtual Wards (VWs) and how those benefits can be used to make the argument for investment in VWs.

The need for VWs is driven by the desire for improvements in quality of care and demands on the healthcare system. Some of these factors include:

- **Patient preferences and clinical impact** where evidence suggests that caring for people in their own homes supports their recovery and is overwhelmingly preferred by patients.
- **Unprecedented demand** for health services, driving the need for increased acute capacity.
- **Elective backlog** adding to the existing demographic pressures on the health service.
- **Workforce challenges** requiring alternative approaches to care delivery.
- **No space for additional physical beds** to meet existing demand, leading to a need for escalation beds.

Investment in VWs could support delivery of objectives set out in the NHS Long Term Plan, including:

- **Empowering people** through access to connected remote monitoring devices at home.
- **Integration** across care settings and across health and care services.
- **Improving efficiency and safety,** enabling staff to care for more people remotely.

This report is driven by the challenge of building a business case for VWs given the following factors:

- **Emergent model**: Systems are testing and adapting key elements of their services to determine the optimal staffing and clinical governance model, patient cohorts, acuity level and use of technology.
- **Limited robust evidence**: Although early research suggests significant benefits, robust evidence is lacking due to challenges with, for example, accessing complete data sets for sufficiently large samples, comparative research given variations in operating models (including acuity levels/measurement), and lack of consensus on selection of control groups.
- **Technology enablement** of virtual wards is still relatively nascent, with system needs evolving alongside an emerging market.

Given these factors, this report provides materials to support local business cases, including key benefits, existing evidence for those benefits, and the data items to strengthen that evidence.

Method

The activities carried out to capture recommendations regarding business case development involved:

- **Semi-structured interviews**: A range of digital, operational and clinical stakeholders were consulted about the optimal data required for delivery and evaluation of VWs.
- **Desktop research**: Documentation around data sharing, data integration and minimum data sets from across the country were reviewed, and key stakeholders in these areas were consulted.
- **Evidence review**: Evidence around key benefits areas was reviewed. An opportunistic method was used with a ceiling on maximum numbers on studies (n=15).
- **Events**: Two events focused on the benefits of VWs were held: a workshop with system stakeholders and a patient and carer involvement focus group.

Findings

There is consensus that caring for people at home should be the default for NHS care in London and as such, stakeholders expressed a sense of urgency around creating a robust business case for VWs.

There is also consensus across London – from clinical and operational leads of virtual wards, senior leaders of provider Trusts, ICB Chief Finance Officers and other stakeholders – that the following are critical to a robust business case for VWs:

- **Admission avoidance**: To date, the VWs programme in London has predominately focused on earlier supported discharge through step-down virtual wards. This approach has: enabled the rapid mobilisation of VW beds; delivered benefit for patients alongside reduced length of inpatient hospital stays; and it has helped generate evidence and learning. However, there is unanimity that a focus on admission avoidance is paramount to VWs sustainability – either by keeping people at home when they become acutely unwell or by providing an admission avoidance pathway from emergency departments and the same day emergency care (SDEC) pathway.
- **Service integration:** In many areas, VWs have been created through the expansion of existing urgent and emergency care services. This approach has enabled rapid mobilisation of VW beds, however the range of services (eg: rapid response, urgent community response, remote monitoring of long-term conditions) and potential referrers/referral points creates complexity for referrers, service providers and commissioners. There is agreement that integration of virtual wards within out of hospital urgent and emergency care services and also within long-term conditions/proactive care services is vital to the business case for virtual wards. Integration will streamline referral points and processes, avoid duplication of effort/resources and clarify for funders from where VWs are to be resourced - step down VWs within the urgent and emergency care allocation and funding for step up VWs being considered as also part of proactive care and long term conditions management.
- **Technology enablement:** According to the November 2023 update for London's Clinical Technology Group the average tech-enabled VWs occupancy rate across London was 43% (range 12 – 85%). There is agreement that further investment in technology is important to the business case for VWs, particularly with emerging evidence showing lower nurse to bed ratios for technology-enabled VWs. However, it is recognised that value for money is reliant on not limiting the use of technology in people's homes to virtual wards. Instead, the use of and investment in technology (eg: point of care testing, remote monitoring and assistive technology) should support care teams to provide urgent and planned care across the care pathway including proactive care, long-term condition management, acute exacerbations, rapid response and virtual wards.

Below is a summary of the findings, based on consensus among the stakeholders engaged for the work. More details and considerations for tailoring this approach are provided in the appendices.

Key benefits

There is emerging consensus that VWs can provide key benefits to drive the case for investment. At the workshop four categories of benefits were discussed: patient, clinical and operational, system and finance and staff benefits. These are shown in table 1. Further detail on each of these benefits alongside the associated evidence – where this was identified – and minimum datasets are provided in the appendices.

Table 1: Prioritised benefits for a VW business case

Patient experience

- Improved patient experience and satisfaction
- More personalised and holistic care
- Improved quality of life

Staff benefits

- Improved staff experience
- Improved recruitment and retention of staff
- Released time to provide personalised care

Clinical and population health

- Decreased nosocomial infections
- Reduced deconditioning and inpatient falls
- Avoided harm of hospital stay

System and financial benefits

- Better use of finite resources
- Reduced avoidable non-elective admissions and re-admissions
- Improved ED performance

When taking into consideration the discussion at the workshop, available evidence and data sets the most compelling benefits (that can be currently demonstrated) for inclusion within a VWs business case are:

- **Positive patient experience**: When investing public money, the views of patients should be a primary driver. Evaluations to date show patient satisfaction rates approaching 100%. Senior stakeholders who participated in the workshop were clear that investing in VWs is the right thing to do for patients, and the system should continue to invest to support delivery.
- **Better use of finite resources**: UK evaluations indicate that a virtual ward stay costs (on average) £1,958 less per patient than an inpatient stay (the range being £357 - £4,500). In one VW with higher-acuity patients, a nurse was able to effectively and safely monitor 8-10 patients without remote monitoring technology and 19 with the technology.
- **Improved patient safety**: Patients are eight times less likely to experience functional decline on a VW, also avoiding exposure to potential risks associated with a hospital setting, such as falls and hospital acquired infections.

Optimising VWs

While these benefits have been identified, further transformation is required to reduce siloed working and shift the culture to optimise efficiency, including:

- **Scope and delineation of services**: VWs are one part of the wider UEC landscape and increasingly linked to step-up from long-term condition services. In some cases, especially where funding has been used to build on existing local services, it is hard to distinguish between the VW and other UEC services (eg: rapid response, UCR and Hospital@Home). As such, there is a need within a VWs business case to clearly define the patient cohort, services and benefits specifically for this service and also to include the dependencies on and integration with UEC, proactive care and long term condition management services.
- **Transforming care**: There was a clear steer from financial stakeholders that integration of services and system-level transformation is required to deliver a sustainable business case. There was particular emphasis on the transformation required to prevent admissions to alleviate the pressure on acute care. In addition, data integration and technology-enablement were highlighted as critical to transforming care so that all members of the multi-professional team have access to data on their patients and staff can manage people's care safely and efficiently through the use of remote monitoring technology.

- **Structuring the system according to care needs, not organisations**: Attendees highlighted that care is currently organised around care settings (acute, community, primary, social), whilst realisation of benefits requires structuring of the health and care system around core needs: 1) urgent, 2) elective, and 3) long-term care.
- **Cultural change**: Addressing clinical hesitation and resistance to altering historical practices is necessary to support increased discharges onto VWs by acute clinicians and admissions onto VWs by primary care clinicians. As clinicians become more familiar with VWs and benefits for their patients are demonstrated, concerns around risk should also reduce.
- **Robust evaluation**: There is a request for more independent evaluation of VWs to determine whether the hypothetical value proposition is being realised in practice, particularly with regards to health economics.

Tailoring the VW business case

Given the variation in operating models, business cases for VWs need to be tailored according to:

- **Audience**: A range of stakeholders (eg: the public, finance, clinical, operational) need to be engaged with virtual wards, and their different perspectives need to be considered in a business case.
- **Purpose**: There might be different versions of the business case which are aimed at different stakeholders for different purposes (eg: engagement or decision making), ranging between a business case that is very high level to one that would be extremely detailed and granular.
- **Pathways**: The business case might focus on all VWs, just on the most effective local pathways or on a generalist or centralised VW hub.
- **Leadership**: The business case will need to be tailored depending on whether the local VWs are acute led or community led. For example, the priority for acutes is likely to include flow through ED and inpatient beds and discharge of patients from inpatient wards. Priorities for community led VWs might include a broader prevention narrative.
- **Do nothing option**: Business cases should include the option of 'do nothing'. As such, there is a need to consider how the system might respond to current pressures if there were no VWs. A good hypothetical question in this regard is: what alternative is there to VWs?
- **Pilot and evaluation**: Research has shown the importance of building a pilot/testing phase into any contract. As such, the cost of delivering a pilot should be built into the buisness case, where technology is being procured. Furthermore, building evaluation costs into the business case is essential to provide assurance that the emerging benefits can be captured.

Data and Evaluation

When considering the right data to collect to support the business case, there are some key considerations.

1. Acuity:

- **Capturing impact on acute hospitals**: A key question for a sustainable business case is whether VWs are reducing pressure on acute hospitals in terms of admission avoidance and earlier discharge. So far, length of stay (LOS) reductions from inpatient discharges has been the focus as the projected LOS of the patient on the inpatient ward is defined. However, a consistent way to compare a VW stay with an inpatient stay is needed - consensus from this work suggests that critical to this is the measurement of acuity.
- **Measuring acuity**: There is no consistently used method for comparing the level of acuity of patients being cared for on VWs. When analysing data/evaluating VWs, it is critical to understand the level of acuity of the patient cohort you are assessing. NEWS2 scores are considered an

important (although not a definitive) indicator, as well as whether a consultant or specialist lead was providing oversight of the patient. The GSTT acuity and dependency tool was mentioned most frequently when discussing means of articulating the levels of care need.[1] The tool assesses acuity based on interventions, professionals involved, scoring systems and patient conditions.

- **Impact on acute beds**: While there are many proxies for acuity, there is no consensus on how to accurately determine whether a patient on a VW would otherwise have been in an acute inpatient bed. The patient acuity level is only one factor in why a patient might occupy a hospital bed. An approach which was suggested by a number of stakeholders was to add a question to the referral form asking whether the patient would otherwise have been admitted to an inpatient ward, or alternatively, asking where the patient would otherwise have been referred to, if not a VW.

2. Phase of transformation:

- **Variation within systems**: Operating models vary significantly across a number of dimensions, including, level of face-to-face care, technology-enablement, referral routes, patient cohorts/ pathways etc Therefore producing comparable data is challenging.
- **Evolution of services**: Services are changing significantly. We are not yet able to define the optimal model of care for virtual wards and the transformation required to drive the benefits of virtual wards is just beginning. Many of the evaluations to date have been of VWs at their very early stages of development, which means the benefits may be underestimated compared a more mature model.

Recommendations

- **Business case for transformation**: The 2023/24 and 2024/25 business cases for VWs should be focused on their current phase of transformation, which includes investment in testing, adaption and generation of real-world evidence. For the next two years the business case should not be aimed at demonstrating the long-term sustainability for VWs – before the sustainability case can be made, more work is needed on: defining the optimal model, the transformation and integration of services and real-world evidence of impact.
- **Strategic and financial alignment**: VWs are currently considered to be part of UEC infrastructure and as such strategic decisions will need to be taken locally on how much of the UEC funding should be allocated to the development of VWs. This will need to include defining what transformation work is necessary to reassure financial stakeholders as to the viability of VW.
- **Value for money**: In order for VWs to demonstrate a return on investment, the focus for London now needs to be on (a) step-up admission avoidance VWs to deliver impact on hospital admissions (b) increasing the integration of VWs within existing (UEC and planned care) services to streamline pathways and avoid duplication and (c) expanding the role of technology-enablement within VWs for productivity whilst also maximising the value of technology in people's home by using it beyond VW stays (eg: long term conditions management).
- **Evaluation metrics**: Review the benefits and minimum data sets detailed in this report to agree common metrics to guide future evaluation work.
- **Evaluation mechanisms**: Embed appropriate data collection mechanisms to support ongoing evaluation based on common metrics.
- **Data ecosystem**: Ensure that care outside of the hospital environment is supported by existing data ecosystems in London, in particular the OneLondon architecture.

[1] For more on the background to the GSTT acuity tool, see: https://kclpure.kcl.ac.uk/ws/portalfiles/portal/168631455/A_new_tool_to_measure_BAKER_Publishedonline16October2021_GREEN_AAM.pdf

Appendices

Appendix 1: Patient benefits

Introduction

At the regional workshop, there was a clear consensus that the key to advancing business cases for VWs lies in recognising the benefits to patients, such as improved experience and satisfaction. Senior finance stakeholders highlighted that the overwhelmingly positive feedback from patients provides the basis for continuing investment into VWs in the short term whilst evidence of the financial business case continues to be captured. Participants also highlighted that demonstrating the effectiveness of VWs for patients is crucial for gaining staff buy-in and engagement in this new care model.

This section details the three patient benefits ranked highest by workshop participants:

1. Improved patient experience and satisfaction.
2. More personalised and holistic care.
3. Improved quality of life.

Further comments made at the workshop and patient focus group are also summarised.

In addition a summary of the research into patient benefits is provided, along with patient information/experience metrics being captured within minimum datasets. While there are only a few large, rigorous studies of VWs, there is significant uniformity across existing research that patients feel overwhelmingly positive about VWs.

Improved patient experience and satisfaction

VWs can enhance patient experience by allowing individuals to receive care in the comfort of their homes. Table 2 summarises relevant findings from research identified during this project.

Table 2: Evidence on patient experience

Evidence type	Evidence details
Systematic review	Higher levels of patient satisfaction than on traditional inpatient wards was found, based on low quality evidence, in a 2021 systematic review of H@H.[2]
GIRFT	Over 99% of patients on existing VWs would recommend the service.[3]
VW	96% of patients said they would use the service again.

[2] Leong MQ, Lim CW, Lai YF. *Comparison of Hospital-at-Home models: a systematic review of reviews*. BMJ Open. 2021 Jan 29;11(1): doi: 10.1136/bmjopen-2020-043285.
[3] Getting It Right First Time, NHS England (2023). *Making the most of virtual wards, including Hospital at Home*.

Evaluation	97% of patients responded with the highest positive response possible when asked if they would recommend the service to family and friends.[4]
VW Evaluation	93% of tech-enabled and 100% of non-tech-enabled patients stated that they were satisfied or very satisfied with their experience.[5]
VW Evaluation	The study found a clear and consistent preference for VWs as well as positive physical and mental benefits reported across 14 case studies with patients and families. [6]
VW Evaluation	Extremely positive feedback was provided about VWs from all participants (7 patient interviews) [7]

Minimum data set

Review of minimum data sets as describing in the introduction identified the following sources to capture patient experience:

- Acute Trust surveys (eg: Friends and Family Test).
- Supplier surveys (eg: via the remote monitoring platform).
- Patient reference groups.
- Library of patient stories.

> *"Having people around you makes you want to recover more quickly. It's like you want to give up more when you're in a hospital bed." (Involvement Group Participant)*

More personalised and holistic care

VWs enable healthcare providers to deliver tailored care plans that consider patients' unique needs and preferences. Table 3 summarises relevant findings from research identified during this project.

Table 3: Evidence on personalised and holistic care

Evidence type	Evidence details
GIRFT	The GIRFT report suggests that VWs can provide more holistic assessment in home circumstances and keep patients in a place where they would prefer to be cared for.
International VW evaluation	There is evidence that VWs can facilitate a more holistic approach to patient care, due to the range of assessment tools and the more informal communication that happens across the VW MDT.[8]

[4] Prosser-Snelling E., Wells E., Shemko E, *NNUH Virtual Ward Final Report* (2022).
[5] KSS Insights (2022), Northamptonshire Virtual Wards, Rapid Evaluation – Summary Report.
[6] Elliot, S, Winter, G. and Ridge, W. (2021), *Final Evaluation of the Leeds Virtual Ward (Frailty).*
[7] Grout, J, Mason, P (2022). *Black Country Virtual Ward - Rapid Evaluation of Dudley Group of Hospitals step-down Paediatric Virtual Ward.*
[8] Eines TF, Storm M, Grønvik CKU. *Interprofessional collaboration in a community virtual ward: A focus group study.* Scand J Caring Sciences. 2023, September. doi: 10.1111/scs.13152

VW Evaluation	Patients were "touched by the person-centred care they received and articulated high levels of confidence and trust in the service"[9]

"I told [the VW nurse] that I have really weak veins, but [normally] no one listens to me when I say that. She didn't bruise me - she was so gentle." (Patient)

Minimum data set

Review of minimum data sets highlighted the following sources:

- Data on interventions used.
- Data on co-morbidities.
- Acute Trust surveys (eg Friends and Family Test).
- Supplier surveys (eg via the remote monitoring platform).
- Patient reference groups.
- Library of patient stories.

Improved quality of life

The use of VWs can be associated with improvements in patients' quality of life, such as mobility, self-care participation in usual activities, pain and anxiety levels. One member of the public said: "your quality of life will still be there in your own home", as opposed to being in a hospital bed.

"Interacting with people instead of lying in a bed for three weeks…we're here, we feed Dad, go shopping occasionally, we were able to get out, he interacted with us and you know, being in the home environment." (Carer)

Table 4 summarises relevant findings from research identified during this project.

Table 4: Evidence on improved quality of life.

Evidence type	Evidence details
CarersUK report	Case studies from Leeds, Kent and Hull and East Riding have suggested that the overwhelming consensus is that VWs patients and their carers felt listened to, treated with dignity and respect, and they have improved trust and confidence in VW professionals.[10]

There is evidence that digital remote monitoring significantly improves quality of life compared to usual care, however, this has not been directly examined in relation to VWs.[11] There is a gap in the evidence

[9] Health Innovation Network (2022), *Virtual Ward Models in South West London Evaluation*.
[10] Carers UK (2022). *Carers UK Policy Briefing: Virtual Wards*. Case studies referenced: Case study: providing rapid care to people in their own home rather than going to hospital, through a frailty virtual ward in Leeds, Angela Gregson, March 2022. Case study: virtual wards empower the people we care for in east Kent, Sharel Cole, Shelley Sage, Shelagh O'Riordan, March 2022. Case study: supporting people living with frailty in Hull and East Riding, Dan Harman, Anna Folwell, March 2022
[11] Olivari et al., 2018 - The effectiveness of remote monitoring of elderly patients after hospitalisation for heart

around quantitative metrics demonstrating improved quality of life on VWs.

Patients highlighted the additional following points:

- **Self-perception**: One carer highlighted how being in a familiar environment helped their loved one feel less like a "very ill" person. It allowed them to maintain a sense of normalcy in their life during their illness, which positively influenced their self-perception and overall quality of life.
- **Praying and spiritual support:** Another important benefit was the importance of spiritual support. One person spoke about how being at home allowed them to receive visits from people who could pray for them, and they could continue openly practicing their faith, like reading the Bible, which isn't always possible in a hospital setting.

Minimum data set

- Acute Trust surveys (eg Friends and Family Test)
- Supplier surveys (eg via the remote monitoring platform)
- Patient reference groups
- Library of patient stories

Further benefits and considerations

Addition benefits to patients include:

- **Reduction in health inequalities:** VWs can potentially address health inequalities by providing equitable access to care, regardless of patients' geographical location or socioeconomic status. The GIRFT report suggests development of VWs offers opportunities to address healthcare inequalities in target areas including COPD and frailty.[12]
- **Public support**: Despite limited public knowledge about VWs, 78% of the general public (*not necessarily* people with direct experience of VWs) report that they would be happy 'to monitor their own health at home using technologies, instead of in a hospital' while 13% said they would not.[13]

During the Focus Group, patient and public participants raised the following considerations:

- **Patient voice**: Patients and carers stressed the importance of including patients in the decision-making process, particularly the decision to admit and discharge. They emphasised that patient views should be considered during multidisciplinary team (MDT) discussions. One specific issue raised was around the number of staff that would be visiting the patient's home.
- **Isolation and mental health:** Some people expressed concerns about loneliness and isolation when recovering at home.
- **Carer commitments:** Carers shared their experiences, revealing how work commitments sometimes limited their ability to provide continuous care. This issue highlights the importance of integration with social and domiciliary care.
- **Service branding and communication:** Some patients found the term "virtual" off-putting, associating it with technology and not seeing anyone in person. They suggested a shift in branding, proposing that the term "NHS Care at Home" better reflects the essence of the service.
- **Time to connect:** Patients valued the personal connection with healthcare staff, continuity of care givers and highlighted the need for staff to have time for meaningful interactions. This human touch was felt to be particularly important for older individuals.

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failure: The renewing health European project - 10.1016/j.ijcard.2017.10.099

[12] Getting It Right First Time, NHS England (2023). *Making the most of virtual wards, including Hospital at Home*.

[13] https://www.health.org.uk/news-and-comment/charts-and-infographics/how-do-the-public-and-nhs-staff-feel-about-virtual-wards

"If [the staff] don't have time to interact, you don't get that connection, and older people particularly like that connection, they like that same face." (Focus Group Participant)

Further relevant data points

Data point	Data source
Adverse events	• Datix log (provider and ICB reports)
Patient outcomes (PROMS)	• Defined at a pathway level
Demographic measures of patients on the VW (age, gender, ethnicity, disability, deprivation) vs matched disease or area control groups	• National SitRep
Number of digitally enabled vs non-digitally enabled patients	• National SitRep
Number of patients refusing VW admission and reason	• National SitRep

Appendix 2: Clinical and population health benefits

Introduction

People experiencing frailty make up around half the population of inpatient wards, and VWs could improve their clinical outcomes, primarily by reducing deconditioning.[14] VWs provide significant benefits by reducing functional losses in such areas as mental status and ability to accomplish activities of daily living. Just having loved ones around can have a clinical impact. As one of our patient participants put it, "having people around you that you love makes you want to recover more quickly."

Hospital Associated Deconditioning was associated with approximately 8.3% of total annual medical spending in the US in 2019

This section details the three patient benefits ranked highest by workshop participants:

1. Improved patient safety.
2. Reduced costs from managing hospital-based harm.
3. Patients better able to jointly manage their condition(s).

Further comments made at the workshop and patient focus group are also summarised.

In addition a summary of the research into clinical and population health benefits is provided along with metrics being captured within minimum datasets.

[14] What proportion of older adults in hospital are frail? https://doi.org/10.1016/S0140-6736(18)30907-3

Improved patient safety

VWs could support reduced inpatient falls, deconditioning, mortality and infection. Improved mobilisation & reduced VTEs.

> *"I wasn't in a happy place at the hospital…They just kept poking and prodding me. I'd had enough of that…When you're lying in the hospital bed, you see other people ill. And [it] just makes you ill. [On the virtual ward] I was in the comfort of my own home. With my family. With meals that I wanted to have. I got better really quickly." (VW Patient)*

Table 5 summarises relevant findings from research identified during this project.

Table 5: Evidence on improved patient safety.

Evidence type	Evidence
GIRFT	Patients are five times less likely to acquire an infection.[15]
NHSE evidence summary	Hospitalised patients are 61 times more likely to develop disability in Activities of Daily Living than those not hospitalised.
NHSE evidence summary	17% of older medical patients who were walking independently 2 weeks prior to admission needed help to walk on discharge.
NHSE evidence summary	50% of patients experience functional decline between admission and discharge.
NHSE evidence summary	Deconditioning contributed to delayed discharge in more than 47% of older patients.
NHSE evidence summary	Once discharged, only 39% of those with a new or additional ADL disability were back to their usual level of function after one year. [16]
NHSE evidence summary	In a study of hospitalized community-dwelling older people at 6 months after discharge, 43% needed continuing help with medications, 24% were still unable to walk a quarter of a mile, and 45% were still unable to drive.

[15] Getting It Right First Time, NHS England (2023). *Making the most of virtual wards, including Hospital at Home*.
[16] NHSEI Tour de East, How to get involved booklet.

Minimum data set

- Number of Datix incidents reported

Other data points

- Mortality (National SitRep + pathway specific mortality rates).
- Number of falls.
- Number of therapies required post-stay.
- Size of care package pre and post VW stay.
- Reduced deconditioning.
- Community metrics measured in UCR, including factors to avoid getting into an admission in the first place.

Reduced costs from managing hospital-based harm

Reduced costs to manage hospital acquired infections, deconditioning and falls. Improved nutrition at home may also reduce costs of poor health from poor hospital-based nutrition. As one stakeholder put it, "if we look after frail population properly, there will be less ongoing needs."

Table 6 summarises relevant findings from research identified during this project.

Table 6: Evidence on reducing costs from managing hospital-based harm

Evidence type	Evidence
GIRFT	Patients are eight times less likely to experience functional decline. Avoiding potential harms in a hospital setting, such as falls and delirium.[17] Reduced extended stays in ED (GIRFT suggest extended stays in ED increases mortality by at least 10%).[18]
Systematic review	No significant difference or lower mortality, based on low to moderate quality evidence, found in 2021 systematic review of H@H.[19]
Peer-reviewed publication	The cost of hospital acquired deconditioning: Hospital Associated Deconditioning was associated with approximately 8.3% of total annual medical spending in the US in 2019.[20] Approximately 1,000 lives are lost due to problems in relation to avoidable deterioration and there are additional treatment and disability related costs of £100 million.
Peer-reviewed publication	The cost of health care associated infections: In 2016/2017, health care associated infections were estimated to have cost the NHS an estimated £2.1 billion.[21]

[17] Getting It Right First Time, NHS England (2023). *Making the most of virtual wards, including Hospital at Home*.
[18] Getting It Right First Time, NHS England (2023). *Making the most of virtual wards, including Hospital at Home*.
[19] Leong MQ, Lim CW, Lai YF. *Comparison of Hospital-at-Home models: a systematic review of reviews*. BMJ Open. 2021 Jan 29;11(1): doi: 10.1136/bmjopen-2020-043285.
[20] Mudge AM, Kasper K, Clair A, et al. *Recurrent readmissions in medical patients: a prospective study*. J Hosp Med. 2011;6(2):61-67. 10.1002/jhm.811
[21] Guest JF, Keating T, Gould D, et alModelling the annual NHS costs and outcomes attributable to healthcare-associated infections in EnglandBMJ Open 2020;10:e033367. doi: 10.1136/bmjopen-2019-033367

Peer-reviewed publication	The cost of falls: Falls are estimated to cost the NHS more than £2.3 billion per year.

Minimum data set

The data set is the same as for patient safety.

- Number of Datix incidents reported

Other data points

- Mortality (National SitRep + pathway specific mortality rates).
- Number of falls.
- Number of therapies required post-stay.
- Size of care package pre and post VW stay.
- Reduced deconditioning.
- Community metrics measured in UCR, including factors to avoid getting into an admission in the first place.

Patients better able to jointly manage their condition(s)

Patient feedback suggests that patients are better able to jointly manage their condition on VWs.

> *"I told [the nurse] I don't think [the device] is working and she came around to see me and fixed it for me. And she explained to me if it happens again how to sort it out. It was very straightforward." (Patient)*

Table 7 summarises relevant findings from research identified during this project.

Table 7: Evidence on patients being better able to jointly manage their condition(s)

Evidence type	Evidence
VW Evaluation	Qualitative data from staff suggested that VWs could lead to improved self-management but this requires face-to-face interaction. "Staff commented on the opportunity to work with patients on rehabilitation and self-management that can result from early discharge but recognised that this would require additional home visits".[22]
VW Evaluation	Qualitative data from staff suggested that VWs could lead to improved patient empowerment:"Staff agreed that being on the VW could encourage patients to become aware of their symptoms and vital signs and give them a 'confidence boost', so they felt empowered to take more

[22] Health Innovation Network (2022), *Virtual Ward Models in South West London Evaluation*.

	insight into their own health. One shared the case of a patient who had bought a blood pressure cuff following his discharge, so he could carry on monitoring his vital signs." The analysis found that face-to-face contact was important to encourage self-management.[23]

Gaps: No quantitative evidence was identified around patient ability to jointly manage their conditions.

Minimum data set

- Increased ability of patient to manage condition (Quantitative score). Source: patient survey (via supplier or trust).

Considerations

These additional points were raised by stakeholders:

Metrics and Acuity

The following points were raised around metrics and acuity:

Metrics: Concerns were raised about how to demonstrate improvements against metrics, for example, around nutrition, falls and deconditioning. There is no consensus on best practice as this is an emerging area. However, it was noted that some UCR teams have experience in measuring relevant metrics.

Baselining: Establishing effective baseline measurements could be a challenge given that, even if a common acuity measure was established, not all patients in acute hospital beds are acutely unwell.

Confusion around 'acuity': There is a confusion when we talk about 'acute' hospitals, as there are a significant number of patients who are not acute, but are in acute hospitals. We should be talking about 'inpatient' wards instead of 'acute' hospitals and understanding this in terms of two offers: inpatient care and domiciliary care, and we should be ensuring that patients of the right acuity go to the right place. This will help make the clinical and population health benefits clearer and easier to measure.

Diagnostics and IVs: Many inpatients are not high acuity but rather only require IVs and basic diagnostics. If we can get IVs and POCT right, we will be able to support a significant number of patients in their own place rather than in inpatient hospitals.

Patient cohorts: Related to acuity, it was suggested that a therapies-lead model could be appropriate for some patient cohorts, but we would need to identify the patients for whom that would be appropriate. Another suggestion was that VWs should focus on the cohort of patients who could be monitored only via tech, who are low acuity but unable to leave inpatient wards for a number of non-acuity related reasons.

Risks and standardisation

The following points were raised around risk and standardisation:

New risks on VWs: The challenge here is that there will be different types of harm that arise on a VW, and this could have a bigger impact than harm on traditional inpatient wards due to the new model of care, including on public and clinician perception of VWs.

[23] Health Innovation Network (2022), *Virtual Ward Models in South West London Evaluation*.

Standardising: In order to realise benefits, given there are different ways of running these pathways, it will be important to explore how we standardise them over time.

Other considerations

Business case recognition: The clinical benefits economic costs associated with them that are relevant to a business case, but there are challenges around recognising those benefits in a business case.

Lack of existing integration and discharge hesitancy in acutes: One stakeholder suggested that existing resources are not currently well integrated and that is a challenge for VWs, which must necessarily build on those resources. Therefore, it will take more time for real cultural change to allow the new model of care to become established. This cultural change is crucial to helping realise the benefits of VWs. For example, acutes frequently do not want to discharge because they don't want people to have to come back in through ED, which brings with it additional risks and system burdens. One suggestion is to change this culture is rotational posts, to build familiarity with VWs.

Care costs: Although there may be clinical benefits of VWs, the cost of additional care in the home, social care, and (in some cases) the higher complexity of VW patients can impact costs. Carers at home might have to give up jobs, which could be an additional cost.

Improved population health management data: Technology used for VWs could provide improved data to make clinical decisions.

Appendix 3: System and finance benefits

Introduction

The potential for VWs to provide better value for money than inpatient wards is significant. Existing evaluations suggesting an average saving around £2000 per patient. However, as the model is still evolving, those costings rely on significant assumptions, and more robust evidence is currently being gathered.

In the meantime, there is consensus from key stakeholders that VWs could provide significant benefit to the system in three ways:

- Better use of finite resources.
- Reduced avoidable admissions and re-admissions.
- Improved ED performance.

This section details those benefits, alongside evidence and key data points to capture to support business cases and evidence generation.

Better use of finite resources

There is consensus that VWs could help the NHS make better use of finite resources. There is emergent evidence that VWs provide:

- a lower cost per patient stay compared to inpatient beds and
- a more efficient use of a limited workforce due to the lower staff to bed ratio.

The VW model of care could also make better use of limited financial resources, by providing cash releasing benefits including:

- *reduced escalation beds* required due to reduced pressure at high-demand periods;
- *increased elective capacity* which generates additional income for the provider;
- *improving ambulance performance*, increasing income to ambulance providers based on targets met.

> *"If I have a patient on the ward, in the acute frailty unit, who is [eligible for the local Virtual Ward] vs a patient from somewhere else [without a Virtual Ward], I'm much more likely to discharge the patient earlier. […] I'll keep patients longer if they're [from a place without a Virtual Ward]." (Acute Consultant)*

Table 8 summarises relevant findings from research identified during this project.

Table 8: Evidence on better use of finite resources

Evidence type	Evidence
Evidence summary	In UK evaluations with very tentative data, cost savings range from £347 to £4500 per patient stay, with an average of £1958 cost savings.
Systematic review	Impact on costs was inconclusive with very low to low quality evidence found in 2021 systematic review of H@H.
GIRFT	2.5x fewer patients treated on a VW are readmitted to frailty beds than the national acute benchmark (GIRFT).
VW Evaluation	For lower-acuity patients, one evaluation demonstrated safe and effective use of single nurse safely monitoring up to 200 patients.
VW Evaluation	In one VW with higher-acuity patients, a nurse was able to effectively and safely monitor 8-10 patients without remote monitoring technology and 19 with the technology.
VW Evaluation	Another evaluation found band 6 Senior Clinical Assessors x 7 (plus 4-5 other senior staff) - to manage 40-45 patients (6-7 patients per nurse), with aim of managing 111 patients (10-12 patients per nurse).

Minimum data set

- Bed days saved – data source: MDS + pathway specific bed days saved
- Cost saving – data source: MDS + cost saving per patient on pathway

Reduced avoidable admissions and re-admissions

VWs could free up physical beds for unavoidable non-elective admissions and planned elective care. By avoiding admissions via step-up and step-down models, more physical beds will be available for elective care and unavoidable planned elective care.

Table 9 summarises relevant findings from research identified during this project.

Table 9: Evidence on reduced avoidable admissions and re-admissions

Evidence type	Evidence
VW Evaluation	In a robust study of a COPD VW, VW patients had an average in patient LoS of 5 days, in contrast to a control group average of 8.1 days and a historic control average of 5.2 days. Cost savings of the VW were estimated at 1:1.45.
Systematic review	A 2021 review showed inconclusive results on length of stay (moderate quality evidence).
Case studies	Case studies (with controls) at Imperial and Chelsea and Westminster have demonstrated LOS savings of 2.9 (COPD), 5.2 (ACS) and 3.4 (IBD) bed days saved.
Systematic review	Lower or comparable readmissions found with low to moderate quality evidence in a 2021 review of H@H.
Local data	Initial data collection in Bromley indicates that patients who have had multiple admissions in previous 12 months have a significantly reduced number of admissions post VW admission (data to be published later this year).
Local data	Data analysis for NHS England, South East Region shows a significant drop in unplanned ED admissions for people over 75 after VWs were introduced in July 2022.

Minimum data set

- Re-admission rates (National SitRep + re-admission rates in VW and matched non-VW cohorts)
- Number of unplanned admissions from ED

Improved ED performance

VWs could improve ED performance through:

- reduced ambulance handover time
- reduced ED waiting times
- reduced 'decision to admit' wait due to ability to discharge from ED to a VW
- earlier discharges from IP beds due to admission to VWs

VWs could lead to improved flow, such as improved bed availability and non-elective flow, by increasing discharge onto VWs from ED and inpatient wards.

Table 10 summarises relevant findings from research identified during this project.

Table 10: Evidence on improved ED performance

Evidence type	Evidence
Local data	Data from PATCH in Hillingdon shows that, for children's VW, inpatient admissions ward or admissions to the Paediatric Assessment Unit significantly reduced. In 2019/2020 December and February, the total was 30%, but in 2021/2022 the number was just over 10%.

Minimum data set

- Ambulance handover time
- ED waiting times
- 'Decision to admit' waiting times
- Length of stay in inpatient wards

Considerations

Long-term investment opportunity: VWs can provide more cost-effective acute care than inpatient beds. However, in the short term, this will not be an immediate cash releasing or cost-avoidance intervention, given the amount of unmet need in the system, including elective care. VWs, at the moment, do require additional resources beyond community, primary and acute capacity, including resources for care delivery, clinical leadership and capacity, and this requires investment. The overall savings for the systems in the longer term are potentially large, but in the short term there may be significant variation in what savings are made.

Investing in VWs is appropriate when applying a long-term lens, thinking about models suited for now and suited for the future. The models may have to adapt overtime, and it is important to plan a model suited for the future, including the ability to link to preventative models of care in the home, using consistent technology and remote monitoring platforms.

Scaling and absorbing growing demand: Although VWs are currently not replacing existing inpatient wards, VWs will be particularly important given the ongoing growth in demand for healthcare resources. Furthermore, when VWs scale up, this could lead to more significant efficiencies than we are currently seeing with existing models.

Carbon emissions: carbon emissions need to be part of every business case, and reduced carbon emissions may be a benefit of Virtual Wards given reduced travel to hospital, reduced ambulance conveyances and other factors. However, it is not yet clear what the impact of VW carbon emissions is, given increased staff travel to and from patient homes. Work is currently being undertaken by NHS England around the carbon impact of VWs.

Targets and variation: We have heard that targets can be a helpful steer from the point of view of finance leaders, in terms of looking at what types of success has been achieved in other ICBs or providers. At the same time, stakeholders agreed that London must accept that it must work to a mixed model, in which no one size fits all, and therefore the benefits outlined here will need to be ???

Workforce uncertainty: Some stakeholders reported that the lack of sustainable funding is impacting workforce and recruitment in London.

Appendix 4: Staff benefits

Introduction

The diversity and flexibility of VW roles may lead to better staff experience. The staff benefits will depend on the nature of the local pathway set-up, and therefore one size will not fit all.

This section details three benefits that key stakeholders felt there was consensus around:

- Improved staff experience.
- Improved recruitment and retention of staff.
- Released time to provide personalised care.

> *"Virtual Ward goes beyond efficiency and clinical effectiveness to improving how we connect [with] and care for our patients as people." (VW clinician)*

Improved staff experience

Staff experience might be improved by VWs. Multiple stakeholders reported that the remote working opportunity could be positive in terms of flexibility for staff. The opportunity to work from home could also broaden accessibility into the workforce, attracting staff with disabilities or who are retired. The experience of remote working during COVID-19 was cited as a precedent for how VWs could improve staff experience. Additionally, by feeling more connected with patients and seeing improvements, staff have reported feeling greater job satisfaction.

Table 11 summarises relevant findings from research identified during this project.

Table 11: Evidence on improved staff experience

Evidence type	Evidence
GIRFT	According to GIRFT, VWs offer improved staff experience.[24]
VW Evaluation	"Positive experiences were directly attributable to the team, its make-up and good relationships between colleagues, including working in a multidisciplinary team," as well as "the flexibly and adaptably of the team in assigning roles and responsibilities, and the perceived lack of hierarchy within the team."[25] Furthermore, "staff felt a sense of satisfaction and pride from working for an innovative service which they believed was highly beneficial to patients"
VW evaluation	In a Norfolk and Norwich evaluation, clinicians reported feeling hugely rewarded by the VW: "It is hugely rewarding to feel we are offering a very high standard of care getting to know our patients well and realising more of the

[24] Getting It Right First Time, NHS England (2023). *Making the most of virtual wards, including Hospital at Home*.
[25] Health Innovation Network (2022), *Virtual Ward Models in South West London Evaluation*.

	nuances and facets of their health journey."[26]

"It's nice to see the patients happy at home and seeing the happiness that brings their family as well" (VW clinician)

Minimum data set

- Staff satisfaction levels via Trust staff survey (ask staff if they work on a VW). This can be used as a basis to compare and contrast VW staff experience with inpatient staff experience.

Improved recruitment and retention of staff

Alternate career development opportunities, especially in community, were mentioned by a number of stakeholders as a potential benefit for staff. With rotational roles becoming standardised, it was felt that this could provide additional development opportunities outside of traditional community or inpatient nursing roles.

Table 12 summarises relevant findings from research identified during this project.

Table 12: evidence on improved recruitment and retention of staff

Evidence type	Evidence
GIRFT	According to GIRFT, VWs offer improved staff opportunities.
VW Evaluation	One evaluation found that staff were positive about "being able to learn new skills/upskill" as a result of working in a multidisciplinary team on the VW. The evaluation also found that collaborative working, skill acquisition (such as remote assessment and trend monitoring), reduction of in-person visits, and the opportunity for remote working "could have positive implications in relation to workforce retention". [27]
VW Evaluation	"Increased clinical interaction and care" was identified as a benefit of VWs by a West Herts evaluation, that suggested VWs provide "more staff engagement and time with patients to build relationships and provide reassurance".[28]

"The nurses have been able to support the physios and upskilling them and doing the computer based training and things like cannulation(..) Likewise the physios have been upskilling the nurses in chest X-ray interpretation, doing ABG sampling, that kind of thing" (VW staff member)

[26] Prosser-Snelling E., Wells E., Shemko E, *NNUH Virtual Ward Final Report* (2022).
[27] Health Innovation Network (2022), *Virtual Ward Models in South West London Evaluation*.
[28] Eastern AHSN and Health Innovation Manchester (2023). *Evaluation report - Chronic obstructive pulmonary disease (COPD) Virtual Ward South and West Hertfordshire Health and Care Partnership*

Minimum data set

- Number of staff recruited, vs inpatient wards.
- Number of staff retained, vs inpatient wards.

Released time to provide personalised care

VWs could allow staff more time to provide personalised care, particularly as staff can experience the environment of the patient's life and provide a more personalised approach.

> *"[The care] wasn't rushed. It was really slow. [The nurse] asked all the questions that she needed to ask. We'd have a nice chat." (Patient)*

Table 13 summarises relevant findings from research identified during this project.

Table 13: Evidence on released time to provide personalised care

Evidence type	Evidence
Evidence summary	Variable evidence depending on acuity level. For lower-acuity patients, one evaluation demonstrated safe and effective use of single nurse safely monitoring up to 200 patients. In one VW with higher-acuity patients, a nurse was able to effectively and safely monitor 8-10 patients without remote monitoring technology and 19 with the technology.
VW Evaluation	One evaluation found staff reported developing a greater personal connection with patients. "One member of staff noted how she enjoyed getting to know patients better, through doing home visits," which was in contrast to her experience of working on a physical ward.[29]
VW Evaluation	This evaluation found that the "Virtual ward takes us back to old fashioned nursing where you really have time to get to know the patient." Another clinician commented.[30]

> *"When they're in hospital, they're just a patient. [At home] you get to see their pets, their garden, their family, like the paintings, like the drawings or whatever their favourite food, what they buy, what they want to eat, what they usually eat at home. So it's actually a good experience to get to know the patients like that." (VW staff member)*

Minimum data set

- Clinician time saved (National SitRep + reduced workload per patient on pathway)

[29] Health Innovation Network (2022), *Virtual Ward Models in South West London Evaluation*.
[30] Prosser-Snelling E., Wells E., Shemko E, *NNUH Virtual Ward Final Report* (2022).

Considerations

Clinical governance: Changes in clinical governance could increase the burden on some staff in the system, and this challenge has been mentioned most frequently in relation to primary care. Some teams have dealt with this by distributing responsibility across a team, given that an ' 'ecosystem'' of practitioners are involved. Other teams have involved community consultant-level staff to take on responsibility for patients. However local governance arrangements are set-up, they should be as clear as possible, including being detailed in the local SOP.

Acuity and skills: The higher acuity patients on 'admission avoidance' VWs require a different skillset than previous community nursing roles. Some areas are recruiting staff specifically with that skillset, while others are providing additional training. Training is particularly important to ensure the highest standards of safety, and there was an ask for additional investment in training. There was a discussion about having flexible UCR roles that can change as services evolve, with the ability to work across a range of out-of-hospital settings.

Recruitment challenges: Recruitment challenges have impacted staff wellbeing in some areas, given the additional pressures of implementing VWs.

Digital literacy: Several stakeholders mentioned the impact of technology on staff. One suggestion was a need to establish the levels of digitally literate in the workforce, and on that basis establishing appropriate training. The overall impact of technology on staff is also unclear, in terms of workload burden, staff experience and staff perception.