Technology Enabled Care (TEC) Discovery

Hospital at Home

May 2024

This report details **Hospital at Home (H@H)** specific insights from the TEC discovery research.

For overall findings and other exploration specific reports please visit the DHCNI website.


Overall Findings


Hypertension


Care Homes


Long-Term Conditions


Hospital at Home


Telecare

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Exploration Approach

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H@H Focus

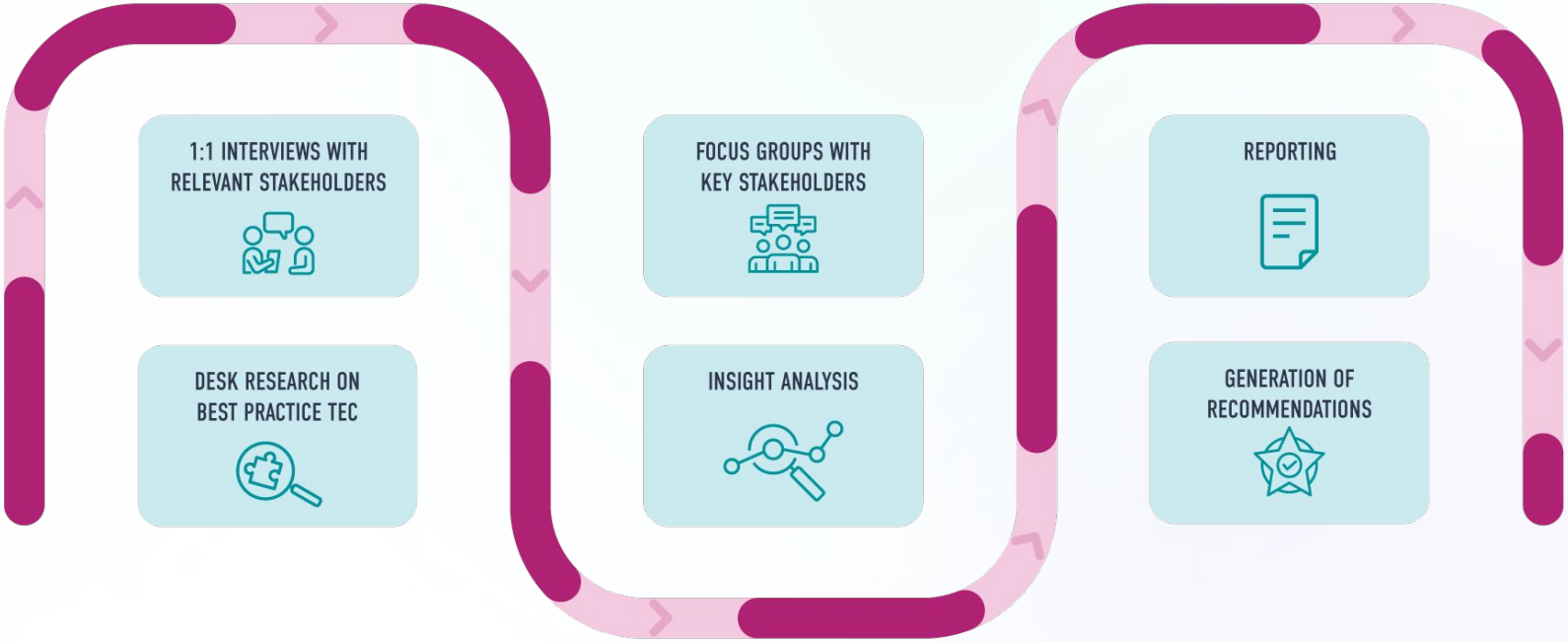
For each exploration, DHCNI proposed a specific application of TEC.

This was used to stimulate conversation during research and determine TEC opportunities and potential challenges with implementation.

*Break down the boundaries between **hospital, community and the home** to facilitate safer, more effective and individualised care pathways, while supporting **self-management where appropriate** and providing coordinated personalised care.*

Exploration Process

The process of exploring H@H followed agile principles, including iterative development, flexibility to adapt to new information, and continuous collaboration with stakeholders to ensure alignment and relevance of the deliverables.



Research Engagement for H@H

35	37%	13	2	11
Participants contacted	Response rate	Total engaged	1:1 interviews	Participants at focus group







- PHA
- Consultant Geriatrician
- AD Enhanced Services

- Department of Health
- Nurse Lead
- Physiotherapy Lead

- Charity and voluntary sector
- AD PHA
- Consultant

Storyboards

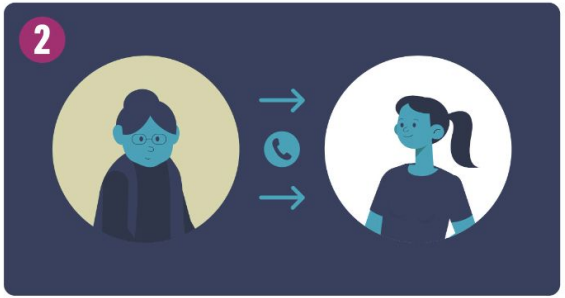
To facilitate TEC focused conversations, storyboards were created describing current and future state scenarios.

These were used in focus groups to facilitate reflection and debate, and to gain insights into the role of TEC in health services.

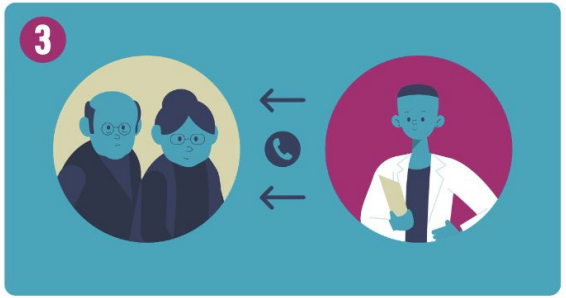
Current State Storyboard

The Current State storyboard illustrates a representative example of a current referral pathway to the H@H service. This was used in the H@H workshop to understand the existing referral pathway and its limitations.

Tommy, 65, lives with his wife in Groomsport and is showing early signs of infection.



Tommy's wife, Imelda, calls GP reception and requests a house visit.

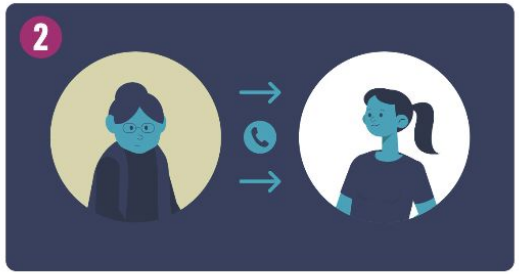


GP completes call back and decides to refer Tommy to the Hospital at Home team.

Future State Storyboard A

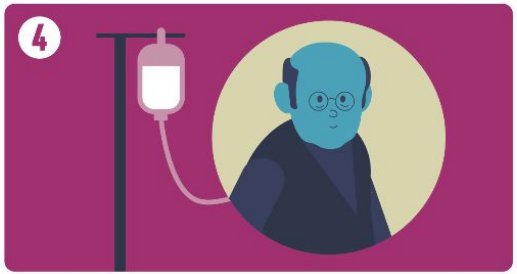
This Future State storyboard shows a potential future use of TEC within H@H.
This was used in the H@H workshop to facilitate discussion about the potential impact of TEC.

Tommy, 65, lives with his wife in Groomsport and is showing early signs of infection.

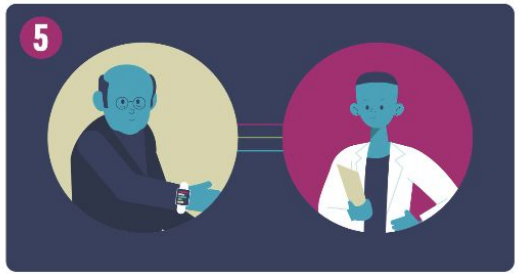


Tommy's wife, Imelda, calls GP reception and requests a house visit.

GP completes call back and decides to refer Tommy to the Hospital at Home team.



After 3 days of IV antibiotics via the Hospital at Home team, they are pleased with Tommy's progress.



Hospital at Home team decide Tommy can be remotely monitored for a further 3 days. TEC is provided so they can review Tommy's readings 3 times a day.

Future State Storyboard B

Tommy, 65, lives with his wife in Groomsport and is showing early signs of infection.

Tommy's son, Cormac brings him to the Emergency Department.

This Future State storyboard shows other potential future uses of TEC within H@H. This was used in the H@H workshop to facilitate discussion about the potential impact of TEC.

Tommy's son, Cormac calls GP out of hours.

Following triage it is decided that Tommy, while unwell, does not require a hospital admission unless his condition could be monitored from home.

Tommy's son, Cormac is concerned and phones ambulance service.

Insights & Opportunities

Through analysing research findings and trends, key insights have been identified.

A Design Insight is a clear and comprehensive understanding of a complicated problem or situation.

Opportunities detail how insights may be actioned / addressed, to move towards TEC adoption and achieve positive outcomes for stakeholders.

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Research Questions

Research Questions

Research questions were composed to define the scope of each exploration discovery and inform the creation of discussion guide questions.

The same research questions were used across all 5 explorations, allowing for the comparative capture of insights.

1. *What are the experiences, attitudes and perspectives of individuals working in H@H regarding TEC?*

2. *How might individuals better be supported or encouraged to engage in TEC innovation?*

3. *What opportunities are available for TEC innovation in H@H?*

Research Questions

1

What are the experiences, attitudes and perspectives of individuals working with H@H regarding TEC?

Research participants were positive and enthusiastic about the potential of TEC to benefit the H@H service.

In particular, TEC was seen as an opportunity to maximise efficiency within the service, facilitating the scaling up of the service to benefit more patients, whilst reducing strain on limited resources.

Research Questions

2

How might individuals better be supported or encouraged to engage in TEC innovation?

Participants sought clearer, frictionless pathways to maximise TEC adoption within H@H.

In particular, participants desired increased clarity, transparency, and consistency for TEC adoption pathways that are standardised across each Trust.

Research Questions

3

What opportunities are available for TEC innovation in H@H?

Participants described a wide range of opportunities for TEC innovation within the H@H service.

These opportunities were mainly focused on improving the efficiency and effectiveness of the service through improvements to coordination of care and resource management.

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Insights & Challenges

INSIGHT 1

The challenge of demand exceeding capacity poses a significant constraint to scaling the H@H service.

Participants described an “infinite demand” for the H@H service. They highlighted how resource limitations create pressures on the workforce, potentially leading to frustration among staff members who feel constrained by capacity issues.

As a result of these constraints, participants describe the existing H@H service as a reactive, rather than a proactive service.

INSIGHT 1

The challenge of demand exceeding capacity poses a significant constraint to scaling the H@H service

> *TEC could amplify the footprint that the workforce can offer.*

> *If TEC can make efficiency then we need it.*

> *Innovation is not brave, it is essential.*

> *Devices [...] would cut down staff time away.*

INSIGHT 2

The current H@H admission criteria does not include all patients who may benefit from it.

Research participants stated that a broader profile of patients may benefit from the H@H service, providing opportunities to reduce acute hospital admissions.

Participants believed that TEC could be used to broaden H@H admission criteria, scaling up service delivery and providing the benefits of H@H to a wider profile of patients across a wider spectrum of care needs.

INSIGHT 2

The current H@H admission criteria does not include all patients who may benefit from it

> *Patients are currently getting about 35-40 mins getting active treatment and are sitting in a bed the rest of the time. Some of these patients could be at home.*

> *People are staying too long in hospitals because there's no other options at the end of an acute journey.*

INSIGHT 3

TEC can optimise processes and enhance the overall quality of care provided by H@H.

Research participants described the existing H@H care pathway as "clunky" and "complicated", with examples of inefficiencies in workflows and opportunities for improved communication across teams involved in care delivery.

Participants believed that a greater presence of TEC within H@H services could improve collaboration and coordinated working - helping to provide more informed and efficient care.

INSIGHT 3

TEC can optimise processes and enhance the overall quality of care provided by H@H

The model is undefined in NI, who's involved?

[We need] TEC for quick and efficient decision making.

[re: biggest challenge] Infrastructure - links between primary care, acute care etc.

Access to the right people at the right time is a big problem."

INSIGHT 4

Inefficient documentation and management processes create challenges to effective communication and coordination that can lead to frustration

Research participants described ineffective documentation methods used in H@H, such as pen and paper and the use of whiteboards.

This disjoint in record-keeping compared to secondary care services underscores the importance of leveraging digital tools as a stable and collaborative tool for documentation in H@H settings.

INSIGHT 4

Inefficient documentation and management processes create challenges to effective communication and coordination that can lead to frustration

> *It would be great if data collected could be recorded in patient records for future reference.*

> *It's difficult to manage and track resources - working from a whiteboard is a nightmare.*

> *The key thing is communicating if they are feeling better or worse - there should be two way communication.*

Challenges

Participants also described the following challenges for the implementation of TEC in H@H:

Process Challenges:

- ➔ Variation in Trust processes emphasising the need for a standardised approach
- ➔ Staff capacity to widen the service
- ➔ Communication and coordination between HCPs
- ➔ Documentation of patient data
- ➔ Liabilities and responsibilities within the service
- ➔ Complexity in service pathway (see next page)

Technology Challenges:

- ➔ Fear of using tech
- ➔ Lack of basic connectivity (i.e. Wi-Fi infrastructure)
- ➔ Protocols regarding malfunctioning equipment

People Challenges:

- ➔ Fear of using tech
- ➔ Concern around data security
- ➔ Lack of family support
- ➔ Lack of TEC awareness including definition, examples and benefits

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Opportunities

OPPORTUNITY 1

Explore the integration of TEC solutions to streamline operations and maximise the utilisation of H@H resources.

- ➔ Proactively address resource limitations by optimising operational processes through TEC. For example, research participants highlighted the opportunity to send nursing observations electronically to co-workers.
- ➔ Leverage appropriate TEC solutions to foster enhanced collaboration and coordination alongside encompass.

OPPORTUNITY 2

There is an opportunity for TEC to support patients who are seeking acute care but who do not fit the current H@H criteria.

- ➔ TEC may provide an efficient, effective, and sustainable approach to broaden H@H admission criteria to include a greater number of patients than are currently admitted.
- ➔ This has the potential to bring the benefits of the H@H service to an increased number of patients.
- ➔ Participants highlighted that whilst TEC may facilitate broadening of the H@H service, this would need to align with the future HSCNI H@H strategies.

OPPORTUNITY 3

Leverage TEC to provide additional patient data that would help enhance and optimise care.

- TEC can be used to monitor, diagnose, and treat patients remotely, improving patient outcomes and enhancing patient experience.
- Using wearable devices and sensors, patients' vital signs (e.g., heart rate, blood pressure, oxygen levels) can be continuously monitored in real-time. This allows healthcare providers to track patients’ health status remotely, promptly detect any deterioration, and intervene early.

OPPORTUNITY 4

Leverage TEC integration with Encompass to maximise the efficiency and effectiveness of documentation and resource management.

- ➔ For TEC to be implemented within current H@H services, there needs to be integration with Encompass.
- ➔ There is an awareness that Encompass will improve inefficient health documentation processes.
- ➔ But, there is an opportunity to **ensure that current/ forthcoming TEC solutions/ interventions are integratable with Encompass to maintain consistency within patient records**.

Further Opportunities

Participants also described the following opportunities for TEC (and other health tech) in H@H:

- Improve capacity resource management challenges through remote monitoring
- Address gaps in health and social care through remote monitoring for less acute patients
- Roll out of video consultation for hospital at home
- Enable more patients to recover at home
  - Ability for users and families to help monitor health and learn how best to manage care
- Collection of population health data to identify trends and inform future services

Moving Forward

This discovery has provided a better understanding of TEC appetite, challenges, implementation requirements and opportunities for adoption.

In the next steps of this work, DHCNI are seeking to address key challenges raised across this discovery through implementing the recommendations detailed in the ‘Overall Findings’ report.

If you are interested in keeping up to date with ongoing work, please visit the DHCNI website.

If you would like more information about this work please contact: Linda.McRandle@hscni.net or DHCNIContact@hscni.net

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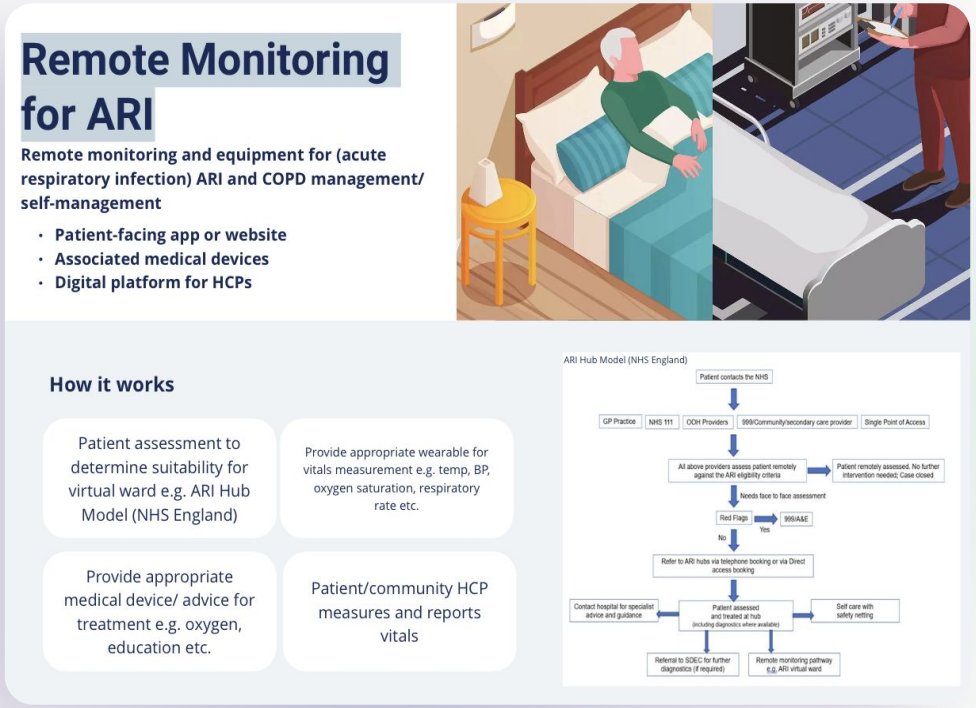
Appendices

Appendix A

DESK RESEARCH

- ➔ Desk research was conducted to understand the use of TEC in H@H, surfacing case studies and models of TEC care.
- ➔ Several examples of TEC technologies used in H@H were identified. Three were selected and used to create lightning posters to stimulate conversation in interviews and focus groups.
- ➔ Full research findings can be accessed through DHCNI.



DESK RESEARCH

H@H Examples

- **The Countess of Chester Hospital at Home** [1] -
  Collaboration with Cheshire and Wirral Partnership NHS Foundation Trust.
  - Combines NHS England Urgent Community Response (UCR), Virtual Wards, IV Outpatient Antimicrobial Therapy (OPAT)
- **Somerset NHS Foundation Trust Hospital at Home** [2]
  - Tailored monitoring that can include telephone or video consultations, or remote digital monitoring devices.
- **NHS Lothian Hospital at Home** [3]
  - Largely used by >75 age group
  - Four teams - City of Edinburgh, West Lothian, Midlothian, East Lothian
- **NHS Royal Devon University Healthcare Hospital at Home** [4]
  - Large range of conditions included e.g. heart failure, atrial fibrillation, flu, acute kidney injury, OPAT, syncope, COPD & frailty
- **NHS Oxford Health NHS Foundation Trust**
  - Team made up of nurses, paramedics, OTs and healthcare assistants
  - Multiple access channels e.g. district nurses, minor injuries unit, out-of-hours services, hospitals, GPs, emergency multidisciplinary unit & case managers.

[1] NHS Countess of Chester Hospital. (n.d). *Hospital at Home service makes headlines* [Online]. Available: Hospital at Home service makes headlines | Countess of Chester Hospital (coch.nhs.uk)
[2] NHS Somerset Hospital. (2023). *Hospital@Home* [Online]. Available: Hospital@Home - Hospital @ Home (somersetft.nhs.uk)
[3] S. Dempsey., Mackintosh, M. (n.d.). *NHS Lothian Hospital at Home* [Online]. Available: hospital-at-home-lothian-presentation.pdf (ihub.scot)
[4] NHS Royal Devon. (2024, Mar. 15). *Acute Hospital at Home (AHAH)* [Online]. Available: | Acute Hospital at Home (AHAH)
[5] NHS Oxford Health. (2023, Nov. 21). *Hospital at Home* [Online]. Available: Hospital at Home - Oxford Health NHS Foundation Trust

DESK RESEARCH

TEC Impact Summary

Acute care for frailty and ARI's are currently the most common focus for NHS H@H [6].

Globally, other areas are also being investigated like heart failure [7], sepsis [8] and pulmonary embolism [9], which will help to build the evidence base for the expansion of NHS H@H services.

- **Acute respiratory infections (ARI) ward**, in Wolverhampton, NHS England, supports people at home instead of hospital admission. This ward originally started as an oximetry remote home monitoring service. In 2020, 5000 patients came to Wolverhampton ED with ARI. Of those, 1200 patients required admission - the ward has helped respond to heighted challenges. Due to the relatively new set up of this ward, there is limited available evidence of financial impact [10].

- **Hospital at Home, NHS Wandsworth and Merton**, offers triage, assessment, and care intervention for people identified as able to return home but requiring additional medical monitoring through 24 hr vital sign monitoring via the Central Remote Monitoring Hub. Between 2020-2021, more than 310 patients have used this service, saving approx. 2134 hospital beds - 66% of these patients were "severely frail" and 88% of patients have four or more chronic conditions, including heart failure, COPD, asthma, and pneumonia [11].

- **Frailty Virtual Ward, NHS England, Frimley Health**, uses TEC for patients who require hospital level acute care at home [12]. This ward has a 96% admission avoidance rate, prevents around 70 primary care visits a month and saves around £631, 000 a year [13].

[6] Sheasby, L. (2023, Jun. 7). *Best Virtual Ward Providers in the UK* [Online]. Available: Best Virtual Ward Providers in the UK | The Access Group
[7] Xia, J., Brownell, N.K., Fonarow, G.C., Ziaeian, B. (2024, Jan - Feb). "New models for heart failure care delivery," *Progress in Cardiovascular Diseases* [Online]. Vol. 82. Available: New models for heart failure care delivery - ScienceDirect
[8] Taiwo, D., Nnamani, N., Ochai, A., Adeyinka, OO. (2024, Mar. 29). "Virtual ward: The future in the management of neutropenic sepsis in the NHS." *Innovations in Cancer Science and Clinical Therapeutics* [Online]. Available: View of Virtual ward: The future in the management of neutropenic sepsis in the NHS (cancerresgroup.com)
[9] Nopp, S. et al., "Early discharge and home treatment of patients with acute pulmonary embolism in the tertiary care setting." *Internal and Emergency Medicine,* vol. 19, pp. 1991-199, Sept. 2023.
[10] NHS England. (n.d). C*aring for people with acute respiratory infections at home, through a virtual ward in Wolverhampton* [Online]. Available: NHS England » Caring for people with acute respiratory infections at home, through a virtual ward in Wolverhampton
[11] NHS Central London Community Healthcare. (2024). *Hospital at Home (Wandsworth and Merton)* [Online]. Available: https://clch.nhs.uk/services/wandsworth-and-merton-hospital-home#:~:text=Originally%20set%20up%20with%20a,rather%20than%20being%20in%20hospital.
[12] Hacker, J. (2024, Mar. 5). Virtual wards: T*he good, the bad and the costly* [Online]. Available: https://healthcareleadernews.com/insight-and-analysis/virtual-wards-the-good-the-bad-and-the-costly/#:~:text=A%202021%20evaluation%20of%20the,the%20rapid%20responses%20control%20group.
[13] NHS Frimley. (n.d) *Virtual wards* [Online]. Available:| NHS Frimley Health Foundation Trust (fhft.nhs.uk)

DESK RESEARCH

TEC Models Summary

Many H@H services across the UK started as *virtual wards* with a focus to support early discharge from hospital. Now, as variations of the service emerge, regional guidance structures the delivery and development of the service:

NHS Scotland H@H

All H@H services in NHS Scotland operate in a unique way but follow specific frameworks and principles for delivery and development. These include:

- **H@H Knowledge and Skills Development Framework** - NHS Scotland
  - Outlines and signposts towards learning opportunities for leadership, practice, learning and development within the H@H service [14].
- **H@H Guiding principles for service development**
  - Outlines responsibilities, published evidence, and key features. [15]

NHS England H@H

Guidance intended for enabling teams to set up TEC H@H services built from current virtual wards and H@Hs. This includes:

- Model virtual ward pathways e.g. acute respiratory illness & frailty [16]
- Digital Technology Assessment Criteria (DTAC) [17]
- Good practice guidelines - to support management of data

Partnerships: HomeLink

The James Paget University Hospital NHS Foundation Trust.

- Over four years, this partnership has saved an average 20 hospital beds per day
- Pathways include; Early Supported Discharge, Discharge to Assess, Virtual Wards, Intermediate Care at Home, Reablement, Rehabilitation, Admission Avoidance, and Bridging Packages of Care.
- HomeLink can assist in setting up H@H service within 12 weeks
- 55% cost saving compared to a hospital bed (£200 vs £450)
- 21% improvement in clinical outcomes [18]

[14] NHS Education for Scotland (NES). 2023, Jul. 4). *Hospital at Home knowledge and skills development framework* [Online]. Available: https://learn.nes.nhs.scot/69532/hospital-at-home-knowledge-and-skills-development-framework/h-h-framework-overview/hospital-at-home-knowledge-and-skills-development-framework

[15] Healthcare Improvement Scotland. (2020, Jan.). *Hospital at Home: Guiding Principles for service development* [Online]. Available: https://ihub.scot/media/6928/2020205-hospital-at-home-guiding-principles.pdf

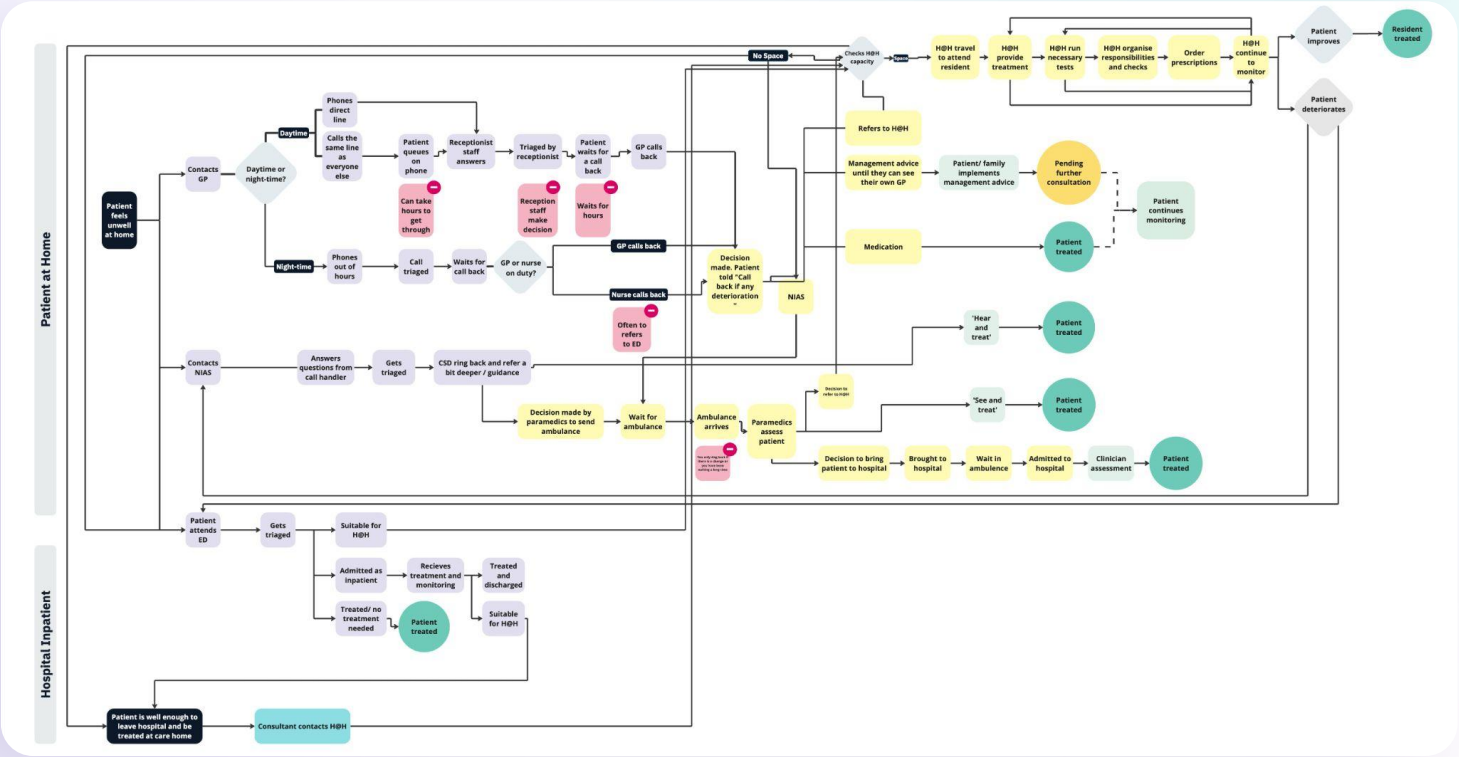
[16] NHS England. (2023, Jan. 26). *Guidance note: Frailty virtual ward (Hospital at Home for those living with frailty)* [Online]. Available: https://www.england.nhs.uk/publication/guidance-note-frailty-virtual-ward-hospital-at-home-for-those-living-with-frailty/

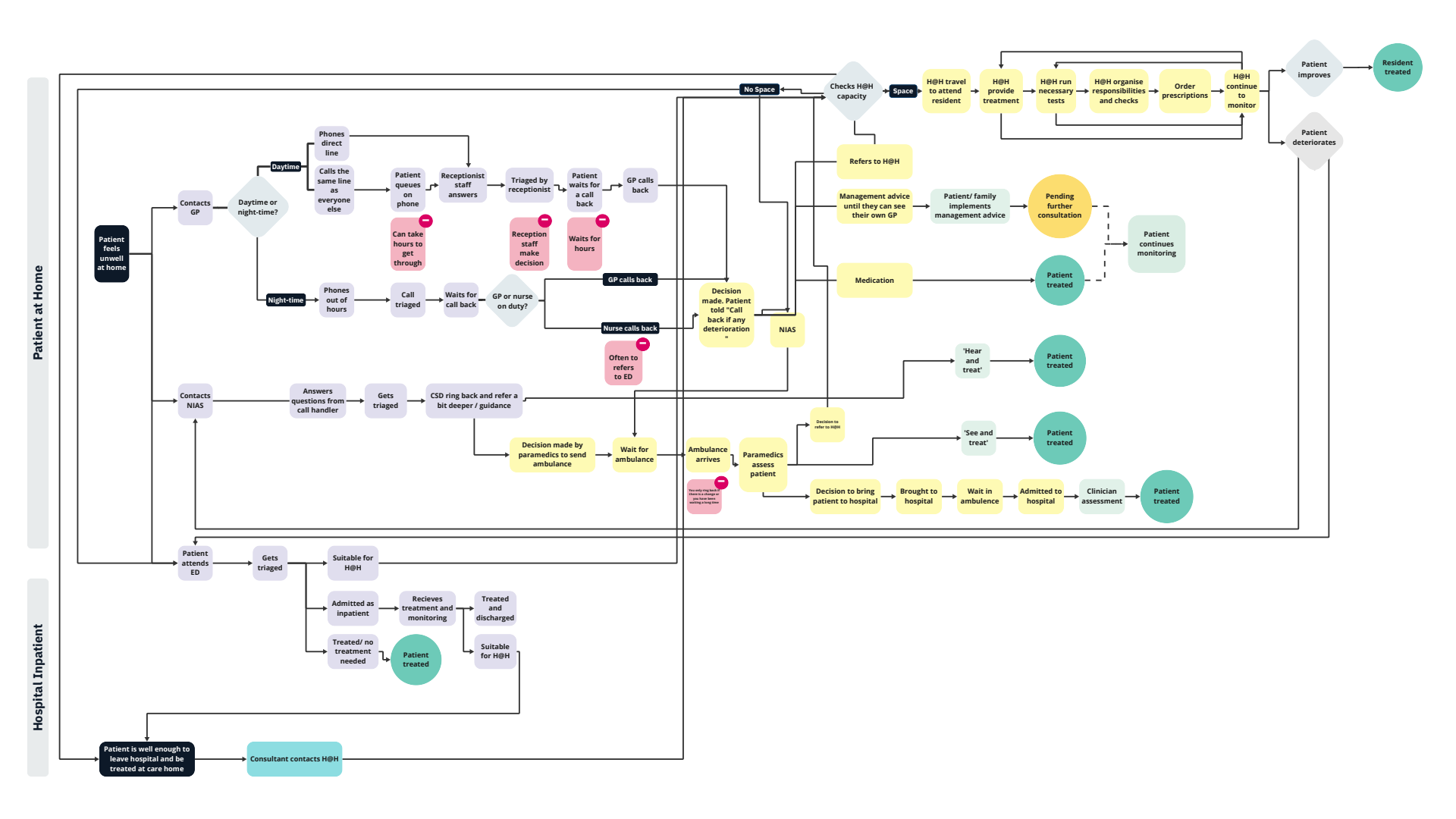
[17] NHS England. (n.d) *Digital Technology Assessment Criteria (DTAC)* [Online]. Available: https://transform.england.nhs.uk/key-tools-and-info/digital-technology-assessment-criteria-dtac/- [18] Case study Archives - HomeLink Healthcare

[18] HomeLink Healthcare. (2024, Apr, 5). *Partnership with HomeLink saves 20,000 bed days at James Paget Hospital* [Online]. Available: https://homelinkhealthcare.co.uk/resource/partnership-with-james-paget-hospital/

Appendix B

CURRENT STATE JOURNEY




Patient at Home
Hospital Inpatient
Patient feels unwell at home
Contacts GP
Daytime or night-time?
Daytime
Phones direct line
Calls the same line as everyone else
Patient queues on phone
Receptionist staff answers
Triaged by receptionist
Patient waits for a call back
GP calls back
Can take hours to get through
Reception staff make decision
Waits for hours
Night-time
Phones out of hours
Call triaged
Waits for call back
GP or nurse on duty?
GP calls back
Nurse calls back
Often to refers to ED
Decision made. Patient told "Call back if any deterioration "
NIAS
No Space
Checks H@H capacity
Space
H@H travel to attend resident
H@H provide treatment
H@H run necessary tests
H@H organise responsibilities and checks
Order prescriptions
H@H continue to monitor
Patient improves
Resident treated
Patient deteriorates
Refers to H@H
Management advice until they can see their own GP
Patient/ family implements management advice
Pending further consultation
Patient continues monitoring
Medication
Patient treated
Contacts NIAS
Answers questions from call handler
Gets triaged
CSD ring back and refer a bit deeper / guidance
'Hear and treat'
Patient treated
Decision made by paramedics to send ambulance
Wait for ambulance
Ambulance arrives
Paramedics assess patient
Decision to refer to H@H
'See and treat'
Patient treated
Decision to bring patient to hospital
Brought to hospital
Wait in ambulence
Admitted to hospital
Clinician assessment
Patient treated
Patient attends ED
Gets triaged
Suitable for H@H
Admitted as inpatient
Recieves treatment and monitoring
Treated and discharged
Treated/ no treatment needed
Patient treated
Suitable for H@H
Patient is well enough to leave hospital and be treated at care home
Consultant contacts H@H