Royal Cornwall Hospitals
NHS Trust

Silent Hospital Evaluation Pilot Project

April to November 2024

Final Report

DNV Imatis

TClarke

wandsworth
HEALTHCARE

1. Executive summary

The evaluation of the DNV Imatis digital communication, workflow, and task management platform *("DNV Fundamentum"*) was conducted from 22 April to 01 November 2024. The objective was to evaluate how a digital platform could support the delivery of a "silent" patient nurse call system. This included the use of the platform by its intended users (via mobile phones), in its intended use environment (a ward setting), and with users executing tasks safely and effectively following the receipt of patient to nurse / midwife calls directly and silently to mobile devices.

The evaluation was conducted in a 25 bed post-natal ward (Wheal Fortune Ward) at the Royal Cornwall Hospital (in Truro, Cornwall, United Kingdom) with the evaluation participants being midwives, maternity support workers, doctors, and nurses from the hospital. It was conducted with a production equivalent set up of the *DNV Fundamentum* platform, with access limited to only one application – the silent call bell application.

All evaluation participants underwent user training prior to the start of the 6-month pilot period. In addition to patient and staff observations and qualitative feedback, data was also collected from the nurse call system to understand the process of call receipt and response, and via the measurement of the ward environment noise levels pre and post pilot implementation.

Surveys for both patients and staff were conducted throughout the evaluation period, with patient surveys being sent to all patients 2 to 3 weeks after the end of their stay on Wheal Fortune ward.

Key findings from the evaluation included:

- Minimum user errors identified during implementation and ongoing use of the platform ; with staff engaging positively with the new nurse call system via a mobile phone and no new risks identified. All evaluation participants were able to successfully engage with the new system and complete all assigned tasks.
- The system was seen as intuitive, easy to learn and easy to use. After some initial concerns about the change to the call answering process, most patients and staff adapted quickly to the new system.
- Noise levels reduced in general on the ward, with quieter conversations and more considerate movement of equipment.
- The quieter ward environment promoted faster recovery with a measurable reduction in length of stay.
- Patients reported improved sleep during their stay on the ward, both for themselves and their new babies. Patients also reported higher satisfaction with their experience of care on the ward.
- Staff reported improved communication when the call bells were silenced, and a calmer and less chaotic work environment.

There were some technical and user problems encountered by the evaluation participants. A discussion on the causes, potential impact and recommended mitigations is provided in *Technical problems encountered during the evaluation* in section 6.6 of this report.

2 About this document

The purpose of this Evaluation Report is to report the results of the Silent Hospital Pilot Evaluation conducted from 22 April to 01 November 2024 on Wheal Fortune Ward at the Royal Cornwall Hospital (in Truro, Cornwall, United Kingdom).

The objective was to evaluate how a digital platform could support the delivery of a “silent” patient nurse call system. This included the use of the platform by its intended users (via mobile phones), in its intended use environment (a ward setting), and with users executing tasks safely and effectively following the receipt of patient to nurse / midwife calls directly and silently to mobile devices.

The execution of the pilot evaluation and the reporting of the results was guided by the Silent Hospital Pilot Evaluation Project Plan which can be found at ***Appendix 1***.

2.1 Readership

This document is to be delivered to DNV Imatis as a UK reference site validation of the *DNV Fundamentum* platform. This document may be shared with external third parties, with the permission of DNV Imatis, and as part of the New Hospital Programme (NHP) “Partnering Agreement” to allow knowledge sharing between the 48 NHP sites.

2.2 Definitions and Abbreviations

Table 1:Abbreviations

Concept / Abbreviation	Definition
EPR	Electronic Patient Record
FFT	Friends and Family Test
NHP	New Hospital Programme
dB	Decibels
RADAR	Organisation Business Intelligence and Reporting Platform
OBC	Outline Business Case
RCHT	Royal Cornwall Hospitals NHS Trust

2.3 Related documents

Table 2: Document titles

No.	Document / title
1	Staff training package
2	Digital Clinical Safety Report
3	RCHT Silent Hospital POC High-Level Design
4	Silent Hospital Patient Survey Questions
5	Call Bell Response Report
6	Noise Monitoring Reports

**Documents available upon request*

3 About this Evaluation

3.1 General Introduction

As part of the NHP technical assurance review process for the new Women and Children's Hospital, due to be constructed in Truro, Cornwall over the next 5 years, RCHT was required to demonstrate the exploration and adoption of digital transformation in the form of "SMART" hospitals technologies. At OBC stage of the Women and Children's Hospital Programme, a digital estates strategy, demonstrating how the new building will seek to incorporate "smart hospital" technologies, and improved estates data collection and management, was developed with the aim of delivering an improved environment for patients and staff.

As a first step towards delivery of the digital estates strategy for the new Women and Children's Hospital it was decided to focus on one technology which could explore the digital connection of staff and patients to the hospital with a small test of change. The Silent Hospital Pilot Evaluation project was developed over the course of two years in partnership with DNV Imatis (Norwegian digital health software specialists and subsidiary of DNV Group, a global leader in assurance and risk management services, mainly to the maritime, energy and healthcare sectors); TClarke (an engineering company and trusted long-term partner to RCHT); and Wandsworth Nurse Call Ltd (the incumbent nurse call system provider to RCHT). TClarke is also a recognised partner to the NHP at national level.

At the inception of the Silent Hospital Pilot Evaluation project in April 2022, RCHT was just starting on a journey to procure and implement an Electronic Patient Record (EPR), and did not have any estates-related digital systems to support the delivery of "smart hospital" innovations. Due to organisational anxiety about the impact of a pilot evaluation of a new digital platform, progress towards the implementation of the Silent Hospital Pilot Evaluation project was very slow and beset with obstacles and delays as the project learnt about delivering digital transformation.

The Silent Hospital Pilot Evaluation project is the first scheme to be trialled to deliver an estates digital transformation strategy for the Women and Children's Hospital Programme. The key objectives were to evaluate how a digital platform could support the delivery of a "silent" patient nurse call system; this included the use of the platform by its intended users (via mobile phones), in its intended use environment (a ward setting), and with users executing tasks safely and effectively following the receipt of patient to nurse / midwife calls directly and silently to mobile devices.

It was anticipated that the reduction of noise levels on a ward, by silencing patient call bells and driving the alerts to mobile devices, would result in benefits to patients and staff by creating a quieter and calmer environment. The aim was to understand the qualitative and monetisable quantitative benefits of the introduction of a specific smart technology, with a longer-term goal of extending the technology to other parts of the existing estate in advance of the new Women and Children's Hospital.

The evaluation sought to measure the reduction of noise and the associated expected benefits of patient and staff well-being; improved operational productivity and better staff engagement in the

use of mobile devices to support daily task management. It was hoped that this test of change could lead in the long term to the introduction of other silencing technologies for medical equipment and continuous patient monitoring of vital signs such as respiratory rate.

3.2 Pilot Participants

There were over 120 test participants from 2 clinical roles (midwives and maternity support workers) all based on the 25 bedded Wheal Fortune ward (post-natal) within the Women and Children's Care Group.

3.3 Items under Evaluation

The main items under evaluation were:

- Noise reduction and the impact of noise reduction on the ward.
- The staff user interface with the new technology.
- The impact of the new technology on patient and staff experience and well-being.
- Any correlation with recovery and length of stay
- The impact of a quieter environment on the speed of response to call bells (not measurable previously).

4 Methodology

4.1 Pilot Design and test environment

The RCHT eHealth Programme Board, which provides governance in terms of the development of digital solutions and change, would only allow the Silent Hospital Pilot Evaluation project to be conducted on one ward, and to trial one application on the digital platform.

The pilot was designed following an offer from DNV Imatis to provide investment in a digital platform, and software suite, to support the delivery of "smart hospital" technology at RCHT. The proposal was to provide an opportunity for RCHT to experience and trial the technology in return for being recognised as a UK reference site for DNV Imatis.

The proposed solution had the goal of integrating, or being interoperable with, existing digital and physical infrastructure. The pilot was designed to allow the collection of workflow data from a relatively small test of change in order to both inform decision making in real time and allow review of work processes and practices with a view to improving staff efficiency.

Originally, the ambition was to trial the data platform on 3 different wards, but a lack of RCHT senior level support, and the limited availability of project management resource, meant that the Pilot had to be focused on just one ward.

Wheal Fortune ward was chosen due to the following factors:

- The specialty will move to the new Women and Children's Hospital
- There was strong and enthusiastic clinical engagement to trial new technologies
- The current physical environment is end of life and located in a building due to be replaced by the new Women and Children's Hospital.

- As a post-natal ward patients would be mostly relatively young and able to provide quality feedback on their experience.
- The impact of the technology would be experienced by 2 patients for every bed space (mothers and babies)

4.2 Evaluation Pilot Governance

4.2.1 Procurement

The pilot was supported by investment from DNV Imatis in a digital platform, and software suite, to support the delivery of the "Silent Hospital" solution on one RCHT ward. The proposal was to provide an opportunity for RCHT to experience and trial the technology in return for being recognised as a UK reference site for DNV Imatis.

To ensure adherence to public procurement regulations, funding for the pilot project was not transferred to RCHT. To protect both parties in the delivery of the pilot evaluation an "Innovation Partnership Agreement," based on an NEC 3 Engineering and Construction contract, was drawn up between RCHT and TClarke.

The agreement was to procure the works and services associated with the project and included agreement on the management and protection of data, intellectual property rights, digital clinical safety, publicity and communications, protection of existing systems and equipment, staff training, termination of the arrangement, risks and insurance, and dispute resolution.

TClarke entered into a contractual arrangement with DNV Imatis to support the delivery of the project, and to provide technical advice and support to both parties on the delivery of "smart hospital" solutions in the UK market.

The agreement was checked by RCHT legal advisors to ensure minimal exposure to risk and to ensure a legal framework was in place for safe delivery of the project. Some independent commercial advice was also received from Arcadis as part of their appointment as Cost Advisors to the Women and Children's Hospital Programme.

4.2.2 Silent Hospital Evaluation Project Working Group

A Silent Hospital Evaluation Project Working Group was set up and met monthly to steer this project and project plan was developed and can be found at ***Appendix 1***.
An MS Teams Channel working space was set up to allow documents to be shared to support wider learning within the project team.

4.2.3 Work Streams

The pilot project was divided into 3 main workstreams:
- **Work stream 1**: Quantification of anthropogenic noise (created by people / human activity)
- **Work stream 2**: Investigation of the impact of noise pollution on patients and staff
- **Work stream 3**: Implementation science (lessons learnt from the pilot to promote successful future technology development and spread).

Work stream 1: The aim was to measure objectively noise pollution on Wheal Fortune Ward before and after the implementation of the DNV Fundamentum platform. Key questions considered were:

- *How is environmental noise measured objectively in hospitals?*
- *What strategies have been used to date to reduce anthropogenic noise in UK hospitals?*
- *What is the noise level on Wheal Fortune Ward and how does this compare to any published standards / guidance?*
- *What is the frequency, source, and reason for noise on Wheal Fortune Ward?*

Work stream 2: The aim was to evaluate the impact of noise on patients, visitors and staff, and the benefits of noise reduction. Key questions considered were:

- *What is known about the impact of noise in maternity, surgical and critical care units in the NHS?*
- *What are the perceived benefits and disbenefits of silencing nurse call bells?*
- *Were the perceived benefits and disbenefits of silencing nurse call bells realised during the delivery phase of the project?*
    - *What is the long-term impact of quieter clinical areas on patient safety and satisfaction?*
- *What is the long-term impact of quieter clinical areas on staff satisfaction and absenteeism?*

Work stream 3: The aim was to understand the positive and negative aspects of the process of implementing this innovative technology, and to learn lessons to inform the future successful spread of the technology (sharing best practice in terms of technology dissemination).
The key questions considered were:

- What are the barriers and enablers to becoming a “silent” ward?
- What is the impact of using smart phones as a key method of communication when aiming to reduce audible noise in the physical environment?

4.2.4 Evaluation Action Plan

A summary of key evaluation activities can be found at **Appendix 2**

4.2.5 Communications Plan

From the initial concept workshops that took place in 2022, through to the end of the evaluation project in November 2024 (and beyond),the Silent Hospital evaluation project has been supported by the RCHT communications team.

A photoshoot was undertaken early in the pilot to provide collateral for the creation of project specific posters, pull-up banners, patient information leaflets and (social) media campaigns. This photo-shot involved staff and patients on Wheal Fortune Ward.

Project and clinical leads from RCHT and DNV Imatis were interviewed regularly on film for social media posts, radio and for written communications during the build-up to the launch of the pilot and throughout the pilot’s lifecycle.

The communications team also led on creating and evaluating the qualitative patient and staff surveys and supported entering the project for several awards in order to generate interest in the

work. The Silent Hospital project was named as a finalist in the national Digital Health Tech Awards as one of the most promising digital innovation pilot projects of 2024.

Another communications goal was to raise awareness across both the hospital's internal audience, and across the wider NHS community in Cornwall; including the Integrated Care Board and local patient group Kernow Maternity Voices Partnership, Work was also put into attracting media interest locally and across the UK, with extensive coverage on local TV news outlets (BBC Spotlight and ITV West Country News) and in the Nursing Times.

4.3 Benefits Identification, measurement, and realisation

The anticipated benefits of the Silent Hospital Evaluation Project were identified and measured in accordance with guidance set out in ***The Fundamentals of Managing Benefits*** (Steve Jenner, February 2022). A continuous cycle framework was followed to manage benefits and covers five key stages:

1. **Identify and Quantify** – In a benefits workshop with key stakeholders, the benefits were identified, clearly defined, and documented in a benefits register. Where possible each benefit was measured, attributed to the Silent Hospital Evaluation Project, and assigned to specific owners responsible for delivering the change to support the expected benefit.
2. **Value and Appraise** – The identified benefits were then classified into: Cash Releasing benefits (CRB), Non-Cash Releasing benefits (NCRB), Societal benefits (SB), and Unmonetisable benefits (UMB). This classification allows more detailed assessment of the overall value of the project.
3. **Plan** – In collaboration with the benefit owners and the RCHT Business Intelligence team, benefits measures were defined, baseline data was collected, and an action plan for the delivery of each benefit was agreed. Key Performance Indicators (KPIs) were regularly reviewed to understand the impact of the pilot, and to seek additional opportunities for improvement. The expected and realised benefits were planned to be communicated to both patients and staff throughout the pilot.
4. **Realise** – the benefits were tracked and measured continuously throughout the project lifecycle and unexpected deviations from the expected outcomes were analysed to determine if additional support or adjustments were needed to achieve the forecasted benefits. Regular updates on benefit delivery were provided to the Silent Hospital Working Group for consideration.
5. **Review** – The benefits of working with the DNV Fundamentum platform will continue to be tracked during the next phase of this project with the aim of sustaining, optimising, and delivering long-term value as a result of this change .

There were 6 main benefits identified and considered as part of the pilot, two of which were retired as the data collected showed a neutral position with no evidence of either improvement or worsening as a result of silencing the nurse call bells. The full Benefits Register is available in **Appendix 5**. The six key benefits are detailed below:

4.3.1 Benefit 1: Improved sleep and faster recovery

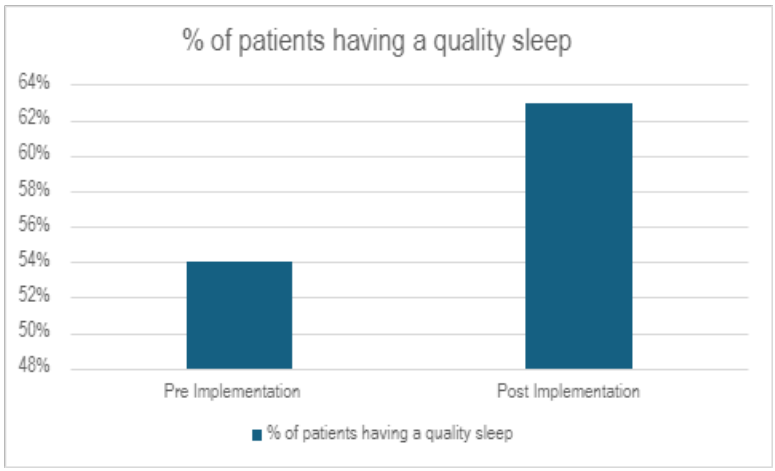
Benefit Type: Unmonetisable

It was proposed that reduced noise levels on the ward would lead to better patient outcomes, particularly related to improved sleep quality. The implementation of DNV Fundamentum was found to reduce noise levels on the ward, and it was reported that due to improved sleep quality and a quieter more therapeutic environment, faster recovery was enabled. This benefit was linked to Benefit 3: reduction in the average length of stay.

Although not easily measurable in terms of a direct cause and effect, it was noted by staff that reduced noise appeared to reduced stress for both the mother and her baby and contributed to better breast-feeding adoption and generally more relaxed babies.

The findings on improved sleep were based on the patient feedback surveys and showed that there was an increase in quality of sleep experienced. A baseline was captured prior to the project start and the satisfaction percentage rose by 9% after the implementation of the silenced call bells

Graph 1

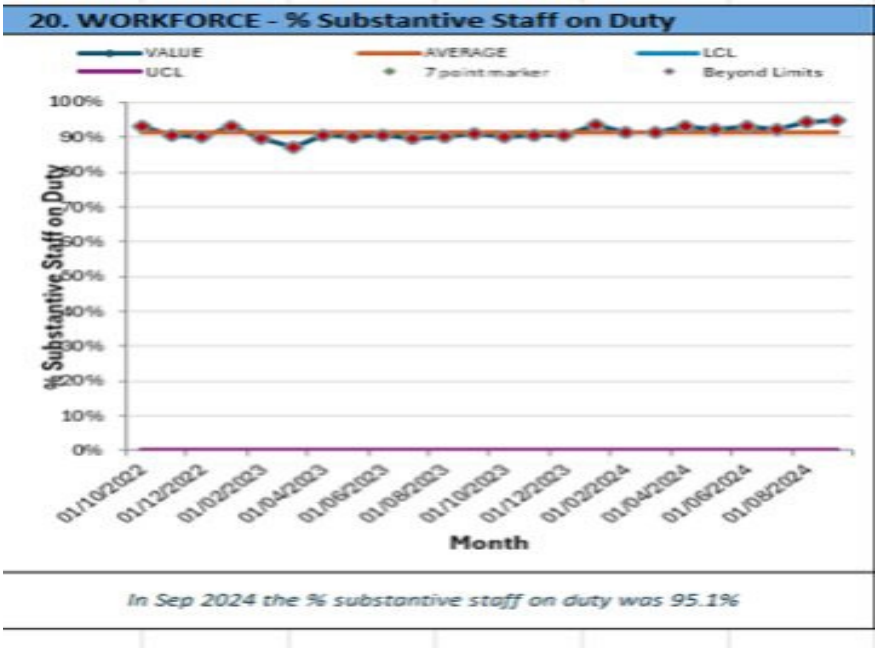


4.3.2 Benefit 2: A reduced use of temporary staffing

Benefit Type: Unmonetisable

It was proposed that reducing noise levels on the ward would improve the working environment for staff and potentially reduce staff absence, and use of the temporary staffing (including the use of the internal RCHT staff bank "Kernow flex."

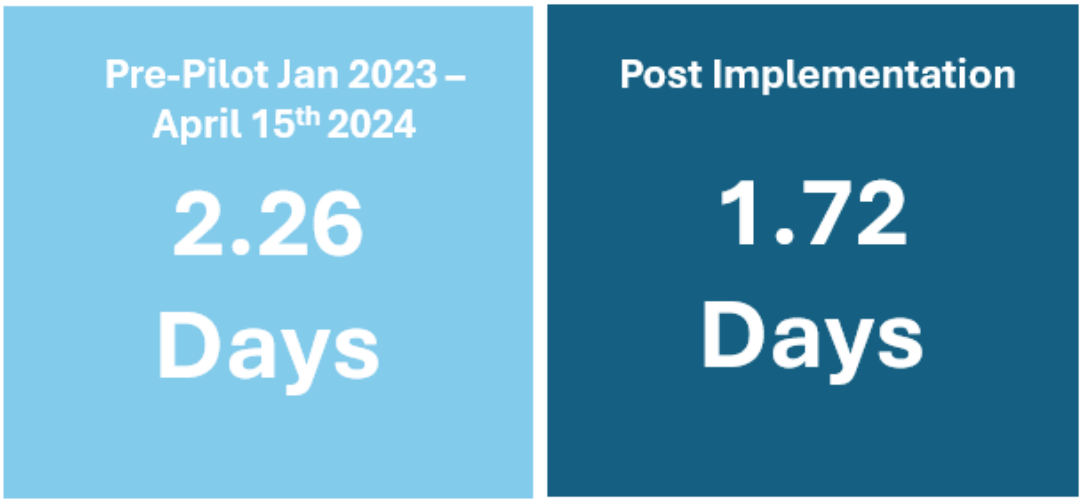
Several key staffing measures were monitored as part of the benefits tracking and there was no noticeable reduction in staff sickness levels. Ward managers reported that over a six-month period it would be unlikely to see a trend in the reduction of absence related to stress (due to lack of longitudinal data) and this was confirmed by analysing the reported staff sickness reasons and feedback of return-to-work interviews during and after the go live of the pilot project.



4.3.3 Benefit 3: Reduce the Average Length of Stay (ALOS)

Benefit Type: Non-Cash Releasing Benefit
It was proposed that reducing noise levels on the ward might lead to faster recovery times and enable a reduction in the ALOS. The implementation of the DNV Fundamentum platform on the ward did result in a statistically significant reduction in ALOS which was measured by tracking the ALOS for the patients during trial period and comparing that figure with the ALOS for the previous 2 years (baseline). Historical data was used to identify any seasonal trends which may occur and to seek to confirm that the reduction in ALOS was because of the project.

The findings on ALOS were:

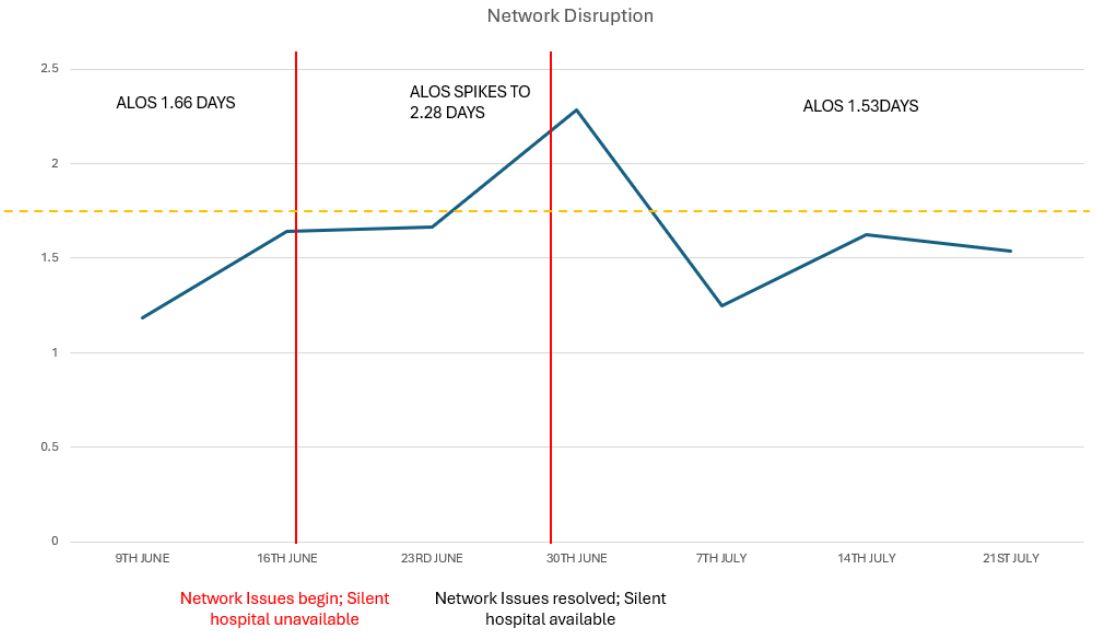


A reduction in average length of stay of 0.5 days per post-natal patient was measured over the 6-month pilot. This could result in a non-cash releasing benefit of circa £75k for a 25-bed ward over a 12-month period.

There was a large site wide network disruption on 16 June 2024 which caused disruption across the network infrastructure and RCHT digital systems. The pilot was suspended, and the nurse call

system reverted to audible call bells while the network issues were resolved. Analysis of the data during this period shows a spike in ALOS for patients on the ward during the return to audible call bells, with ALOS reducing again once the silent operation of call bells resumed. This potentially demonstrates the positive effect the silent call bell system had on the ALOS however it is recognized that the increase in ALOS might be due to the more general impact of the IT outage on patient care. The extension of the trial through 2025 provides the opportunity to verify under more controlled conditions that the observation is causation rather than correlation.

Graph 2



4.3.4 Benefit 4: Improved measurement of call bell response times

Benefit Type: Unmonetisable
With the implementation of DNV Fundamentum, the Ward Manager on Wheal Fortune Ward was able to collect and interrogate data, for the first time, on the time taken for staff to answer the call bells.

The assumption supporting this benefit is that having the ability to record and analyse call bell response activity will lead to improved call bell response times and greater staff accountability for the delivery of care. Being able to track call bell response times also provides important clinical governance data which could be used when responding to complaints or investigations.

The findings on call bell response times were that there was a continuation of response time aligned with results and data from pre-pilot audible bells. There was a qualitative impact that showed improved responses from staff resulting from nurse calls being routed to the primary care giver enabling higher quality initial care.

4.3.5 Benefit 5: Reduction in the number of patient safety incidents

This benefit was retired due to insufficient data to show either improvement or worsening from the baseline data for patient safety incidents on Wheal Fortune Ward.

4.3.6 Benefit 6: Reduction in the number of patient and visitor complaints

This benefit was retired due to insufficient data to show either improvement or worsening from the baseline data for patient and visitor complaints on Wheal Fortune Ward.

5 Implementation

5.1 Stakeholder Communication

Planning and Collateral

A simple communications plan was drafted in August 2023 to support the project immediately post launch.

Stakeholder categories were identified as follows :

- Patients
- Staff on Wheal Fortune Ward (as a post-natal ward these staff included midwives, maternity support workers, and the Ward Manager)
- Patient leader groups, including Kernow Maternity Voices Partnership, and a designated pilot project RCHT “Patient Leader” (Patient Leaders are members of the public with lived experience of local clinical and non-clinical services who are engaged by RCHT on specific projects and topics to provide patient level feedback on the design, development, and operation of NHS services)
- Members of the Women and Children’s Care Group and all staff at RCHT / the Cornwall and Isles of Scilly Integrated Care Board and New Hospital Programme colleagues
- Cornwall IT services and Clinical Governance leads
- RCHT Operational Estates team and other RCHT subject matter experts
- The RCHT Executive Leadership Team
- Partner organisations specific to the pilot project (e.g. DNV Imatis. TClarke and Wandsworth Healthcare)
- Local and National Media (including Social Media)

It was important to ensure that the pilot project was explained to all internal and external partner stakeholders from the start, so that they could understand how the technology worked, appreciate the potential benefits, and build their enthusiasm. This was especially important for the RCHT Executive Leadership Team, and RCHT IT and clinical and digital governance leads, who needed assurance that the pilot would not introduce an unacceptable level of risk for patients whilst the new technology was being trialled .

Understanding how to move to an immediate contingency, should there be any incidents on the ward, or the need to revert back to existing systems and processes, was also important . The ward staff were reassured to know that , should they need to , they could switch back to the audible system at any time without the need for digital technical support. In addition, there was a lot of

interest in ensuring that the staff had full user training and felt confidence in the system, and their ability engage with it, ahead of the launch.

Communication collateral was created in advance of the launch in the form of pull up banners, patient leaflets, staff and patient surveys and questionnaires, and hand-out cards. The photo-shoot was authentic in the use of real patients and Midwives and Midwifery Support Workers. Briefing meetings were scheduled to explain the new technology, and to support the "super users" in developing their knowledge . A short film was created, featuring staff and patients on the ward, and a media campaign was planned for the launch using the key messages outlined in the project brief.

Coverage

The pilot project was given 2 weeks to settle down before the media launch to ensure everything was working to plan. The RCHT Communications team ran news stories, and the short film, across their own social media channels (and those of key partners), and content was also recorded for the hospital radio station and for the dedicated website for the planned new Women and Children's Hospitals . https://building.royalcornwallhospitals.nhs.uk/

Noise and environmental data collection, and surveys for patients, began before the silent call bells were introduced to create a baseline against which post-implementation results could be compared. Further opportunities came towards the end of the pilot to invite TV crews, and other media such as local radio, onto the ward to experience the quieter environment for themselves. ITV West Country News, and BBC Spotlight, visited the ward and covered the project extensively in their news programmes and online in late November and December 2024.

See **Appendix 6** for a list of specific media coverage

Awards and Conferences

During the concept and work up stage of the project, some members of the project team were invited to deliver a workshop presentation at the ***European Healthcare Design Conference*** **in London,** in June 2023. Now that the pilot has completed, a video and poster submission has been sent for inclusion at the European Healthcare Design Conference 2025.

Some of the RCHT project team also attended the Institute of Healthcare Engineering and Estates Management Conference (IHEEM) in Manchester in October 2024 as guests of TClarke, Wandsworth Healthcare and DNV Imatis, to showcase the pilot project. More communications collateral (a leaflet) was created for this event and several presentations were made. Both conferences have been supported by prolific social media posting.

RCHT and DNV Imatis have together entered a number of awards, including the Health Tech News Awards 2024 (where the project was a finalist in the Most Promising Pilot category); and the Health Service Journal (HSJ) Partnership Awards 2025, (where the project is a finalist, pending final judging, in the Best Technology Partnership of the Year award). A submission has also been made for the HSJ Digital Awards 2025.

What have we learnt from extensive stakeholder engagement ?

With a quality product it is not difficult to attract good staff and patient engagement. The pilot project had excellent support and interest from key stakeholders, especially the ones who really matter – the patients, staff, and visitors. The challenge for this digital transformation pilot was more around providing assurance that this new technology was safe to use with patients and staff and would not unduly impact existing IT systems, strategy, and plans. With hindsight much earlier engagement with the technical and regulatory stakeholders would have been beneficial and would have saved a lot of time and emotional energy.

A further communications campaign is being developed to support the ongoing development of the Silent Hospital. The main focus now is on seeking the funding to continue the project to the point where there is sufficient evidence of the benefits of the system to support a business case for investment in silencing call bells across the organisation.

5.2 Staff Training

The training model for the Silent Hospital was based on the concept of "train the trainer," allowing knowledge of the system, and practical hints and tips to get the best from it, to be passed on to colleagues working from shift to shift at the twice daily main ward handover. The training was undertaken both by remote Microsoft Teams sessions, and via face-to-face sessions on the ward. "Super users " were trained to ensure that skilled and confident users of this modern technology were on duty on every shift, and in total, 61 super users received training.

To reach all those who needed training, different methods were employed :

a) **Interactive power point presentations:** a PowerPoint slide deck was created for the ward-based personnel to allow them to conduct training at their own pace during in the month leading up to the start of the trial. The slides contained detailed descriptions of system functionality and user interaction and included inbuilt demonstration videos.

b) **Super user training (MS Teams):** Several meetings were conducted on MS Teams, with groups of 4 to 6 "super users" on each session, to provide more personal training and to allow individual questions to be answered . The role of ward "super user" was established to ensure that there would always be trained staff present on every shift with a thorough understanding of the system. These roles were primarily to help others to use the system correctly.

c) **Videos on YouTube:** Videos were produced on site of actual user interaction with the system on Wheal Fortune Ward; with close-up footage of the smartphone application interface and the buttons that were clicked. YouTube was chosen as platform to provide simple access for all.

   If additional budget had been available the project team would have preferred to have explored the purchase and use of a dedicated digital training platform, as this would enable interactive training to be delivered more widely and at a time and location to suit all users . The extremely limited budget to deliver the Silent Hospital project, in an organisation which has no Project Management Office (PMO) resource to call upon, led to the decision to use the "train the trainer" model.

   Whilst the "train the trainer" training model was successful in the implementation of the system across one 25 – bed ward; a wider deployment would require a far less personnel intensive model. A digital training platform would allow staff access to training materials at any time of the

day; training progress and understanding can be recorded, and the training can be delivered to much larger numbers of people with the appropriate level of governance.

5.3 Technical set up

The technical infrastructure requirements were set out in a document provided to RCHT by DNV Imatis and agreed in June 2023. The document covered the following aspects:

- Virtual servers
- Network requirements
- Domain Name System (DNS) records
- Data traffic
- Back Up services and Remote Access
- Client specifications – PCs and Smart phones

The platform operated via a completely separate server to the RCHT system and the only link to RCHT systems was to access the RCHT active directory to allow identification and recognition of staff logging into the app. The technical set up was supervised and supported by a technical expert from DNV Imatis working with Cornwall IT Services (CITS) colleagues.

The Wandsworth Healthcare nurse call system was upgraded in summer 2023 to a version which supports integration with the DNV Fundamentum Platform. This was part of a planned estates upgrade programme being delivered across the hospital and was funded by RCHT.

The mobile handset used in the pilot evaluation was an iPhone SE. The devices required were provided to Wheal Fortune ward from stock already purchased by RCHT to support the roll out a new Electronic Patient Record system (EPR); a project which was running concurrently with the pilot evaluation period.

The technical setup involved the technical development team from DNV Imatis, and the technical teams from Wandsworth Healthcare and the Cornwall IT Service (CITS). The technical set up took place over 3 months. The key stages were:

Stage 1 – DNV Imatis and Wandsworth Healthcare created a cloud-based testing environment to develop the bespoke messaging protocols and to enable platform integration and communication
Stage 2 – CITS created the required virtual server environment for the DNV Imatis application servers
Stage 3 – CITS allowed remote access and data collection capabilities for the DNV Imatis technical teams
Stage 4 – DNV Imatis remotely installed the application servers and tested the communication with the existing Wandsworth Healthcare nurse call servers.
Stage 5 – CITS deployed the DNV Imatis app on the iPhone SEs provided to the ward and tested the active directory integration
Stage 6 – Technical sign off of the app connectivity and functionality with test calls was achieved.

Final site acceptance testing took place on 17 April 2024 and the pilot launch was formally signed off by the technical and clinical teams. The technical setup took place as per the project programme and no significant technical issues were experienced.

Feedback from staff about the use of the handheld devices indicates that using shared devices adds additional time, and complications, in respect of unlocking the iPhones to respond to call notifications. The shared devices were required to have alphanumeric passwords to unlock the handsets, as biometric security was not possible due to the number of users potentially sharing a device between shifts.

5.4 Regulatory Review

Before beginning the pilot, the proposed solution was required to be defined as either a software app or a medical device. DNV Imatis provided assurance that the software being trialled was not a medical device, as defined by UK Medical Device Regulations 2002, and this then dictated the internal governance and clinical safety routes required for the authorisation of the pilot to commence.

DNV Imatis provided assurance that as a digital health supplier they are required to maintain compliance with NHS Transformation Directorate's Digital Technology Assessment Criteria that includes data governance and security requirements, interoperability, and web content accessibility guidance, alongside clinical safety (regulation DCB0129).

DNV Imatis works with a third party, (8-Fold Governance), specifically to continually clinically risk assess their products and to act on behalf of DNV Imatis as their UK Clinical Safety Officer.

DNV Imatis is also accredited to ISO 27001 and ISO 9001 standards.

5.5 Digital Clinical Safety Review

The pilot project had to be approved and signed off by the RCHT Digital Clinical Safety Officer and the requirements to be met were as follows :

- All RCHT cyber security documentation completed
- The *Clinical Risk Management: its Application in the Manufacture of Health IT Systems* standard **(**DCB0129) met ,completed and approved
- A clinical risk assessment completed by the Women and Children's Care Group and the RCHT Risk Manager
- Receipt of the supplier Clinical Safety Case Report
- RCHT acceptance of the DNV Imatis high-level "Proof of Concept Design Document
- A full RCHT approved Staff Training Plan in place and being delivered

The process for digital clinical safety and general RCHT sign-off took over 3 months to complete. The length of time taken was partly due to the RCHT Clinical Safety Officer leaving the organisation mid-way through the process and the subsequent delay as a replacement governance route was established, and existing documentation and processes were re-reviewed.

5.6 Pilot Launch and delivery

The full list of launch and delivery activities are included in **Appendix 4**. These are all the project related activities completed in the lead up to the launch of the pilot and a list of the responsible stakeholders.

6 Evaluation Activities

6.1 Work stream 2: Patient Feedback

The collection of patient feedback was chosen to seek answers to some the questions **for Work stream 2.** An electronic patient survey was developed and distributed to patients 2 to 3 weeks after they were discharged from the ward, and results from patient feedback surveys were collected before and after the implementation of the call bell silencing.

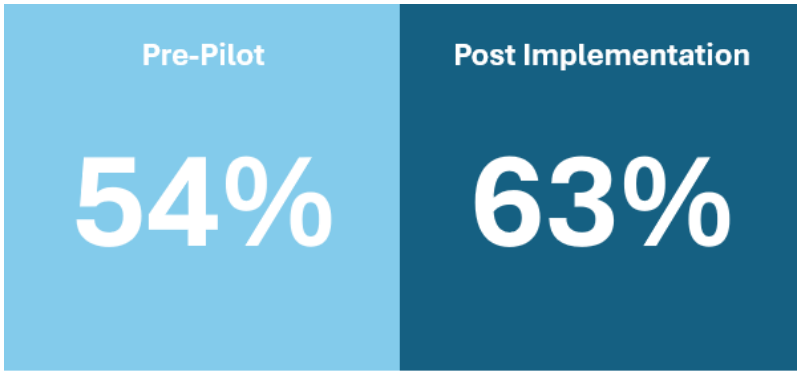
How did patients feel?

When asked to score how calm and secure the patient felt during their stay a scale of 1 to 10 was adopted (with 1 being not calm or secure at all; 5 being quite calm and secure, 10 being very calm and secure) .

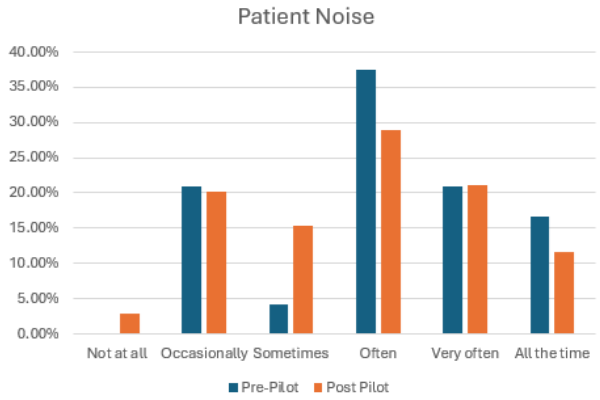
Option	Total Pre Pilot	Total PostPilot
1	0%	0%
2	0%	0.51%
3	6.2%	3.59%
4	3.1%	2.05%
5	6.2%	8.21%
6	9.3%	4.10%
7	24.8%	11.28%
8	9.3%	18.46%
9	6.2%	12.82%
10	27.9%	38.97%

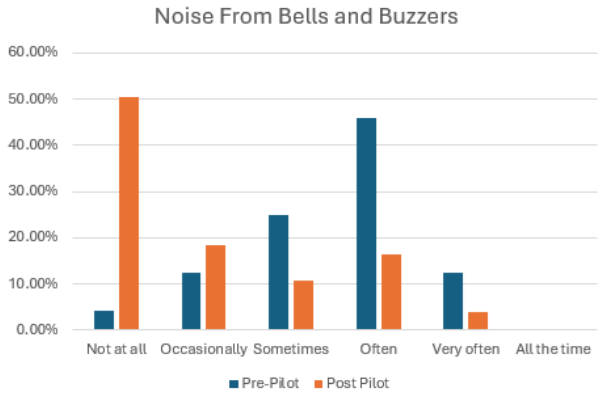
Comparisons were made between the feedback on the quality of sleep before the DNV Fundamentum platform was implemented, and after the launch of the new system. Results from the patient surveys show an increase in the quality of sleep experienced by patients when the new system was operational.

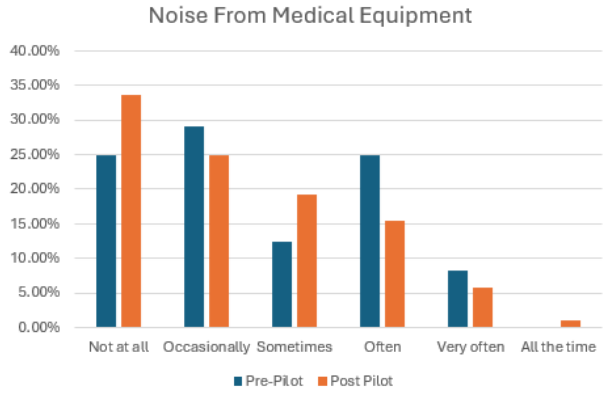
Patients who answered yes to having a quality night sleep rose by 9%.

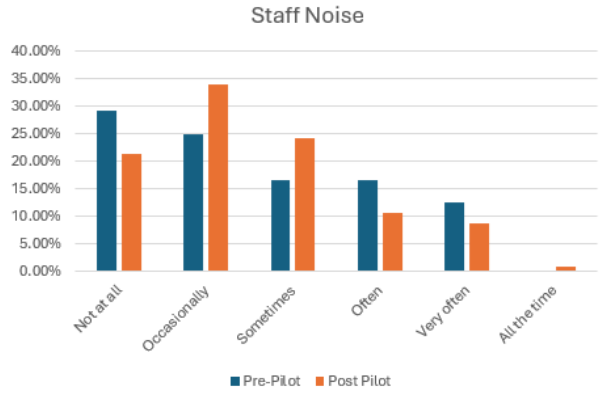


Analysis of the patient experience data also showed variance in the types of noises experienced which affected the patient's stay. Patients were asked to identify the types of noise they heard most on the ward during their stay.





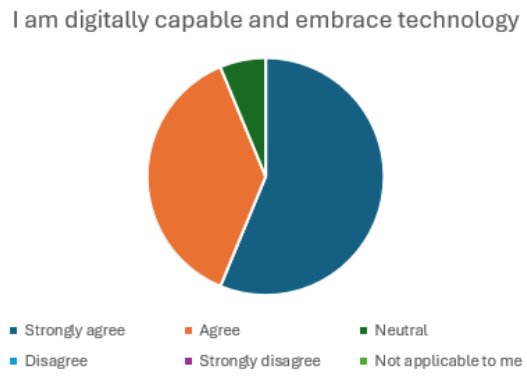


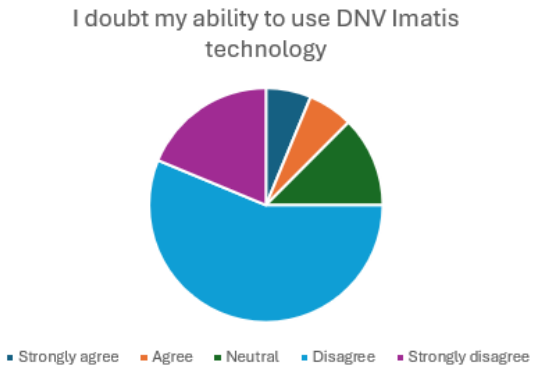


6.2 Work stream 2 : Staff Feedback

Initial feedback from the staff engagement sessions was positive in terms of the implementation of the pilot and the adoption of the technology, especially the use of mobile phones.

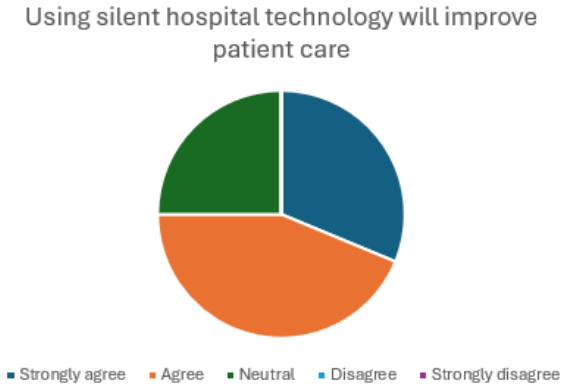
Staff were confident in using digital solutions and are familiar with using application-based technology within their daily lives.

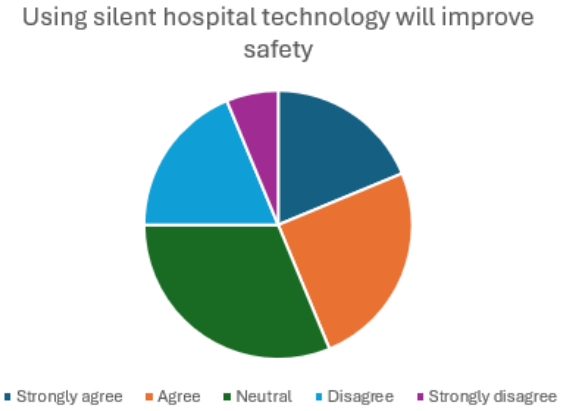




When asked about the use of DNV Imatis solutions, staff confidence in the technology and the staff's ability to use these applications the results showed positive feedback.

Staff were asked about their opinions regarding the impact that the DNV Imatis solution has had and would have in the clinical area.





The feedback from staff regarding the effect on safety was mixed, with a distribution of replies. Further engagement is being progressed with staff in a workshop environment to qualify this feedback.

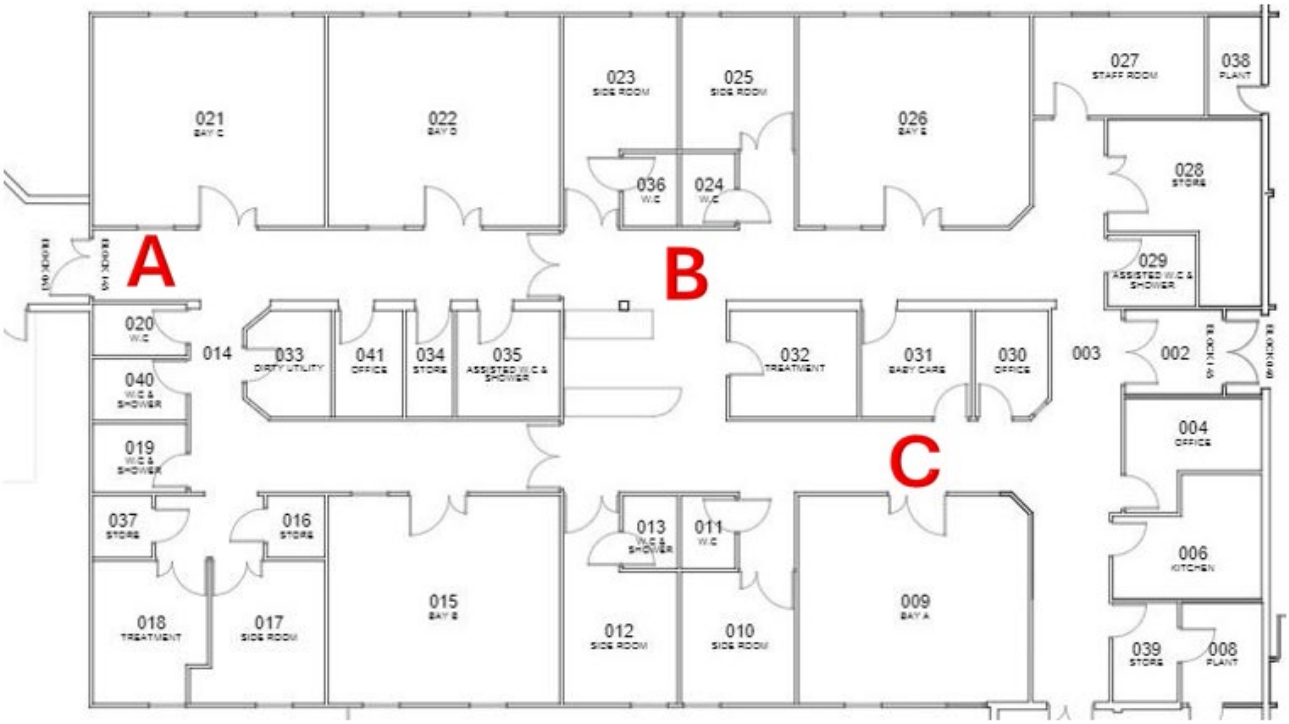
6.3 Work stream 1: Acoustic Measurements

With support from the RCHT Quality Improvement (QI) team, the RCHT Health and Safety team conducted noise monitoring on Wheal Fortune ward in early April 2024 with the aim of collecting

data on noise levels before any change was implemented. The noise monitoring sought to identify the causes of any noise exceeding the 80 decibel (dBA) level to allow preventative measures to be considered.

A reading of 80 decibels dB(A) is the level at which employers must assess the risk to workers' health and provide them with information and training. This level is mandated by the Control of Noise at Work Regulations 2005. There are also specific noise requirements for new healthcare facilities set out in Health Technical Memorandum 08-01: Acoustics. Sound level readings were taken at several agreed locations on Wheal Fortune ward: The main entrance (A), opposite the nurses' station (B) and outside Bay A (C). The locations are marked in **red** on the map below.

The locations were chosen to represent key activity areas within the ward. The areas identified were the main entrance/exit to represent the noise created by the transition of people and equipment into the clinical area. The nurses' station was chosen due to the large amount of activity around the area, including handovers, telephone enquiries, administrative tasks and the meeting and greeting of staff and visitors. The third location was chosen at the patient bay to measure noises experienced by patients during their stay.



The noise monitoring was conducted using a RS Pro DT-8852 data logging sound level meter over a two-working week period on weekdays only. The monitoring was conducted at three set times each day (09:00, 12:00 and 15:30), all lasting three minutes with data recorded at one-minute intervals. The sound level meter records data in Decibels A (dBA).

The pre and post noise analysis graphs can be seen at **Appendix 3**
The equipment is used by the RCHT health and safety team for noise audits. The limited budget precluded the project from installing permanent sound monitoring devices.

The noise measurements show varying results across the three locations chosen to record the data. Before the pilot evaluation period noise level readings can be seen to spike regularly at a maximum of 80db across all 3 measuring locations. Average noise levels were in the 60db to 80db range with minimum noise levels in the 45db and 60db range.

During the pilot evaluation period noise level readings peak in the 50db to 70db range; whilst minimum noise levels were recorded in the 37db to 53db range. There were some outlying data points. In general, however, the data shows a decrease in noise levels in each of the designated measurement zones on Wheal Fortune ward.

Summary of noise measurements pre and post pilot go live

Pre-Pilot summary

	Peak (dB)	Avg. (dB)	Min. (dB)	Avg. (dB)
Ward Entrance	85.1	70.26	38.8	45.69
Nurses Station	80.4	69.90	42.3	50.64
Outside Bay A	78.4	68.29	42.3	49.35

Post Pilot Summary

	Peak (dB)	Avg. (dB)	Min. (dB)	Avg. (dB)
Ward Entrance	74.90	63.39	35.10	43.64
Nurses Station	76.40	62.38	36.10	46.75
Outside Bay A	73.90	61.55	36.30	44.30

The sound levels showed a decrease in sound levels post pilot indicating a drop of between 2dB and 5dB across the measured areas. This is a significant reduction in the noise experienced by the human ear.

Following from acoustic learning a 3dB change in can represent a 50% increase or reduction in perceptible sound levels to the human ear.

****source https://pulsarinstruments.com/news/understanding-3db-rule/***

6.4 Logged Technical Data

Throughout the trial data logs were analysed from the Wandsworth Healthcare nurse call server and the DNV Imatis application and database server. The primary data logged and analysed was the relationship between nurse call activation and the acknowledgment and response times from the mobile application. Data containing declined and accepted calls was also collected and analysed for benefits tracking purposes.

Technical logs were collected to monitor log-in events and system integration messaging events. These logs enabled remote monitoring of system activity and historical data for trouble shooting and diagnostics.

No patient identifiable data was stored or shared at any point during the trial, as per the RCHT digital clinical safety and e-Governance approvals.

6.5 Patient Safety Data

There was one patient safety incident raised on the RCHT DATIX system, (the electronic system used to record incidents and risks across the organisation) . The DATIX raised was in relation to staff logging out of their mobile devices before completing handover during shift changes. This practice resulted in periods of time when no mobile devices were available with staff logged in to the app to receive notifications from call bells. Additional staff training was given as a result of this recorded incident, and a review of the ward shift handover Standard Operating Procedure (SOP) was undertaken and suitable changes to clinical practice implemented.

At the beginning of the trial staff raised concerns about silencing the call bells originating from the bathrooms on the ward. The clinical teams advised that calls from these locations were generally urgent calls and early in the pilot the call bells from bathroom and toilet locations were configured to be always audible. The ward staff were assured that that if an audible call bell sounded during the trial it would be immediate notification of a high priority situation potentially impacting patient safety.

6.6 Technical problems encountered during the pilot evaluation

Not all members of staff are added to the Staff Directory before their shift starts.	Ward Manager	17 April 2024	CITS to capture all maternity IT users to ensure all are added to the Staff Directory Wandsworth Healthcare team have reconfigured the bathroom call bells to be audible.
Staff are concerned about the bathroom call bells being silenced.	Ward Manager	10 April 2024	
Staff have found the device screen locks too quickly and they do not have enough time to log back in to meet response times to answer each call bell. This was the most raised complaint.	Staff Feedback	10 May 2024	No change as the screens must be locked out to maintain patient confidentiality. The password options were discussed with the ward manager, who agreed the current password was the best option.
At times there was no noise or vibration when the call bell was pressed.	Ward Manager	09 April 2024	DNV Imatis were informed and “de-bugged” the system. 26.June 2024: it was noted there was a correlation with devices being dormant for at least a week.
If a patient raises a call while the server is rebooting, it will appear on the nurse panel, but will not be sent to the DNV Imatis system or nurse phones.	Wandsworth Healthcare	10 June 2024	Wandsworth Healthcare raised this issue with DNV Imatis and wider in their own organisation . Server reboots are scheduled at 2am monthly to allow updates and ward staff are informed of the planned reboot times.

Some members of staff are logging out of their devices too soon before their shift ends and leaving fewer staff accountable for each patient for short periods of time before the next shift sign in.	Staff	10 June 2024	The Ward Manager reminded the ward team during handover that all staff must remain logged in to the call bell system until they have handed over all allocated patients at the end of the shift.
The system was returned to audible due to hospital-wide server and Wi-Fi problems .	Ward Manager	11 June 2024	RCHT network problems resulted in audible call bells being used for 2 weeks. CITS resolved the network problems and silent call bells were re-instated.
Some positive staff engagement has been impacted by the extra time it takes during shift handover (5-10 mins) to assign patients on the app.	Staff	17July 2024	Discussions were held with staff about the more limited scope of the project without an operational Electronic Patient Record to allow the digital access to patient data to support task management.

7 Summary of Results and Discussion

The objective of the Silent Hospital pilot project was to evaluate how a new digital platform could support the delivery of a "silent" patient nurse call system. The project was an exploratory transformation project conducted in an NHS acute hospital which is currently behind other NHS acute providers in its digital transformation journey and has no Electronic Patient Record. RCHT is very limited in terms of digitally supported mobile task management but does have a slowly developing digital strategy to improve the management of the Estates and Facilities function.

The Silent Hospital pilot project was conducted over 2 years with external investment and "part time" project management resources. It took a long time because NHS staff were working above and beyond, and outside their daily job descriptions, to explore the art of the possible when it comes to reducing noise levels in a clinical area and improving the experience of the delivery of healthcare for patients, staff, and visitors. A dedicated and well-resourced project team could have set up and delivered this pilot in a much faster timeframe.

The key results from this pilot are as follows:

a) **Connecting healthcare workers to the built environment via digital systems to enhance and improve the experience of work.** Results delivered:

- Positive staff engagement with the new distributed task management technologies.
- Effective staff training on a mobile device used in everyday life.
- Enthusiasm to explore more applications.
- Minimal user errors when working with the new system.
- Rapid assimilation of new processes into the work of the clinical area.
- Improved communication between staff and a calmer, less chaotic work environment.

b) **Noise reduction.** Results delivered:

- Noise levels reduced in general on the ward, with quieter conversations and more considerate movement of equipment.
- The quieter ward environment promoted faster recovery with a measurable reduction in length of stay. This finding is exciting as it delivers a measurable benefit which could provide additional capacity for income generating elective work if the solution is implemented across the hospital.

- Patients reported improved sleep and higher satisfaction with their experience of care.
- Staff accountability was enhanced by being assigned specific patients to monitor via a system which can easily measure the speed of response.

c) **Learning about digital transformation project delivery.** Results delivered:

- A rapid learning curve for less digitally "literate" staff about the UK regulatory requirements for digital clinical safety.
- Recognition that taking the time to embed staff training, and keeping open lines of communication throughout the pilot, is essential to maintain user confidence and ensure any clinical risks of trialling new processes, working practices and technologies are minimised.
- The importance of relentless high quality internal and external communications, to generate interest and enthusiasm to explore digital possibilities. Good communications also provided professional assurance to a wide range of stakeholders on clinical safety and high-quality care throughout the pilot.
- Learning from other countries and cultures and exciting our NHS staff with the possibility of improving their experience of work as well as the patient's experience of care.
- Recognition of the importance of identifying, evaluating, and delivering the anticipated benefits of digital transformation in advance of developing a robust business case for investment. Too often non cash releasing benefits may be minimised in importance at an early stage by NHS business case development processes. This pilot has highlighted what is possible when the main goal is to invest to improve quality and the patient experience.

7.1 Recommendations and Next Steps

The staff on Wheal Fortune ward are very keen to keep the silent call bells in operation on their ward, and to extend the pilot to explore some more distributed task management support applications available via the DNV Fundamentum platform. The project team have been successful in an application for some limited digital transformation funding in 2025 , from the NHS New Hospital Programme, and are planning to extend the pilot for a further 12 months on Wheal Fortune ward to gather more data.

The RCHT Executive Leadership Team have agreed that the project can explore two more applications available via the platform – real time staff messaging connected to bed spaces and tasks relate the bed space; and patient differentiated nurse call, which may include food ordering and the involvement of Facilities staff in trialling task management via a mobile device.

A key challenge for the next phase of this pilot project is exploring how the DNV Fundamentum platform can work with an Electronic Patient Record (EPR) provider, as RCHT is finally implementing a new EPR by November 2025. The benefits and challenges of working with individual, but interoperable, digital platforms will form a key part of the next phase of the project.

With a further 12 months of data from the DNV Fundamentum platform, the objective for the next phase of this project is to develop a successful business case for wider investment in this solution across the whole hospital.

A Blueprint about the Silent Hospital Project, to share on the NHSE Digital NHS knowledge sharing platform, is also in development.

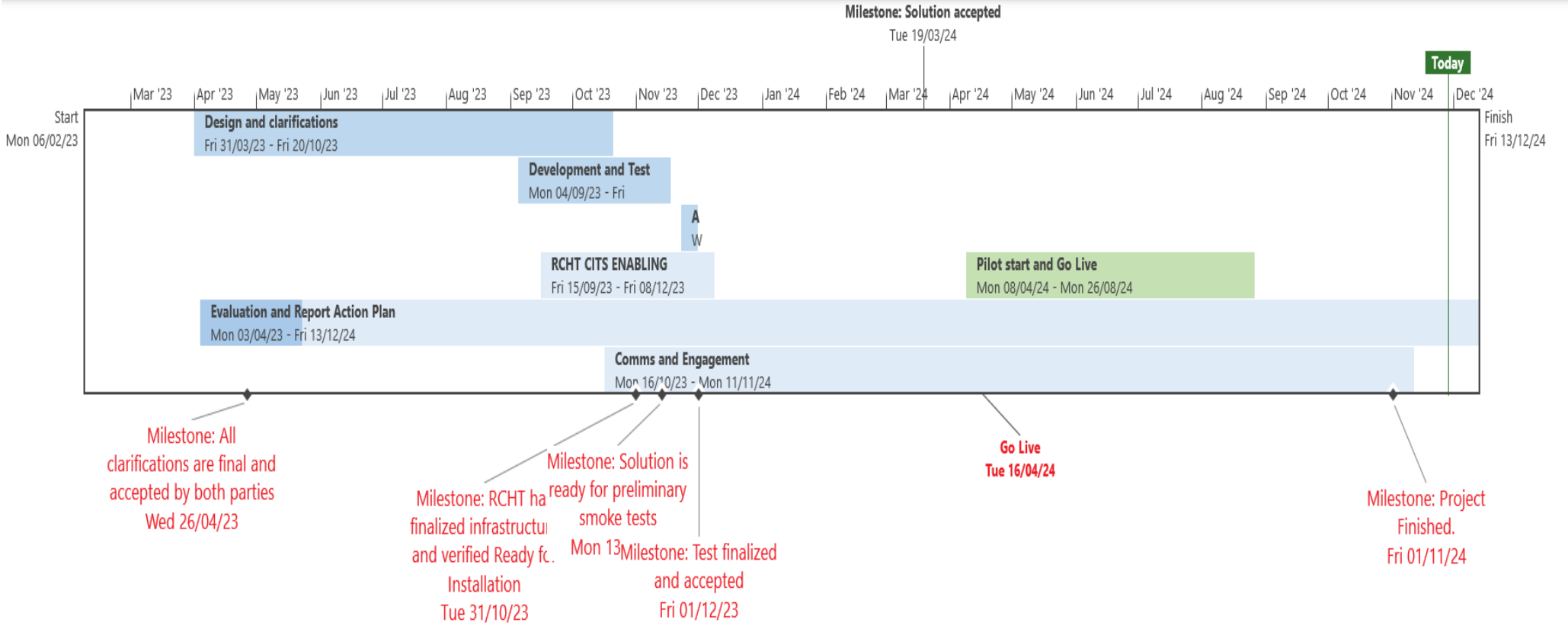
8 List of Appendices

Appendix 1: Hospital Pilot Evaluation Project Plan
Appendix 2: Summary of Evaluation Activities
Appendix 3: Ward Noise analysis
Appendix 4: Implementation and Go Live
Appendix 5: Benefits Register
Appendix 6: Media coverage from the pilot project launch

Royal Cornwall Hospitals
NHS Trust

Appendix 1

Hospital Pilot Evaluation Project Plan



Appendix 2

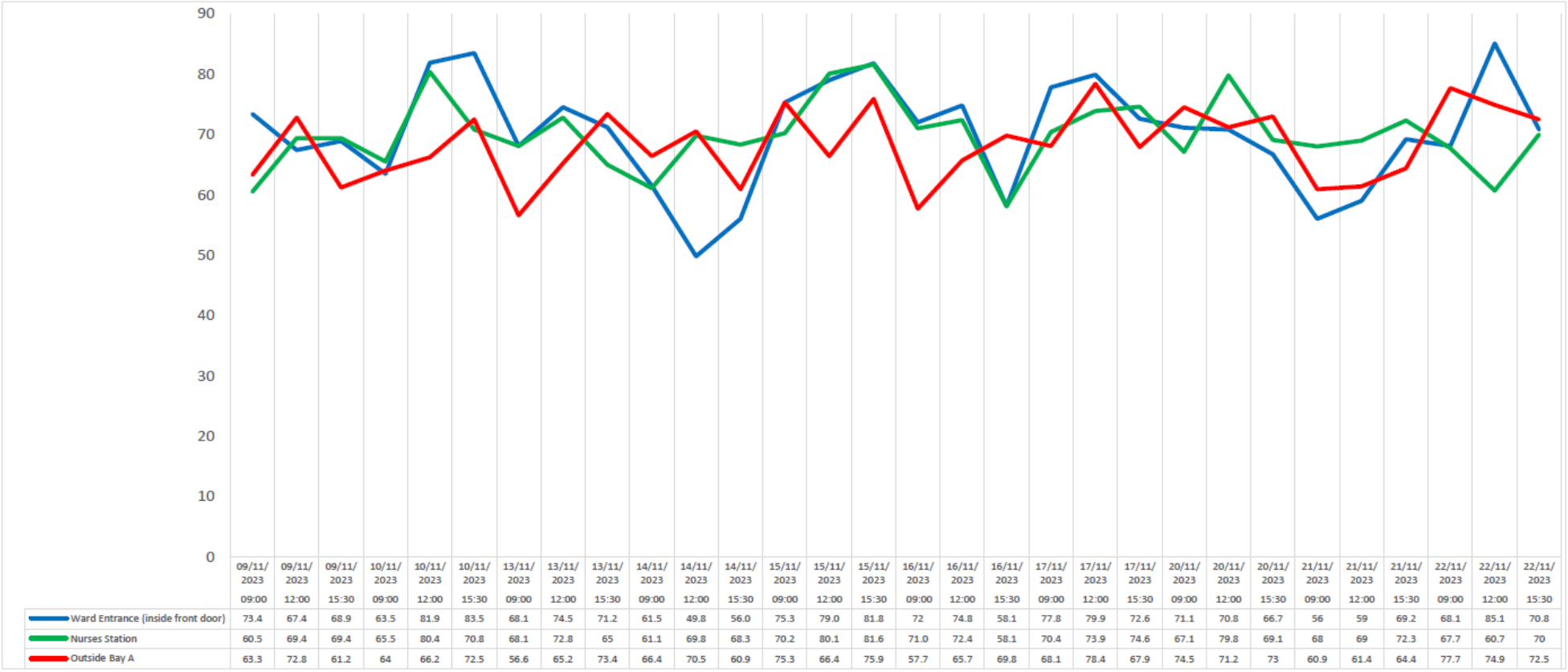
Summary of Evaluation Activities

Key Evaluation Activity	Method/Source	Project Phase
Patient feedback	Friends and Family test post-natal FFT - responses to noise source question (added to all FFTs Aug 2023) - review of free text comments	Comparison of pre-implementation and pilot phase
	Maternity Voices Partnership – questions/interviews at feeding clinics	Pre implementation, during pilot phase and after pilot phase
	Datix complaints module – related to noise/communication/call bells	Comparison of pre-implementation and pilot phase
Staff feedback	Online questionnaire for all staff linked from online training module (views on the technology and usability)	Pre implementation
	Questionnaire linked to pre implementation responses and selection of staff interviews	After pilot phase
Acoustic measurements	Spot check decibel recording by Health & Safety Team	Pre implementation, during pilot phase
	24hr continuous monitoring of decibel levels (recommended iPhone App)	Pre implementation, during pilot phase
Tech log data	Wandsworth (Nurse Call) activity data – time from call bell activation to deactivation at patient bedside	Pre implementation
	DNV Imatis activity data – time from call bell activation to acceptance of alert by staff member to deactivation at patient bedside	During pilot phase
Patient Safety data	Datix incident module – related to noise/communication/call bells	Comparison of pre-implementation and pilot phase
	Post incident reviews – Ward Manager & Patient Safety Midwife	During pilot phase

Appendix 3

Pre-Pilot Ward Noise analysis
Monitoring Period: 09 to 22 November 2023

Peak Reading Data



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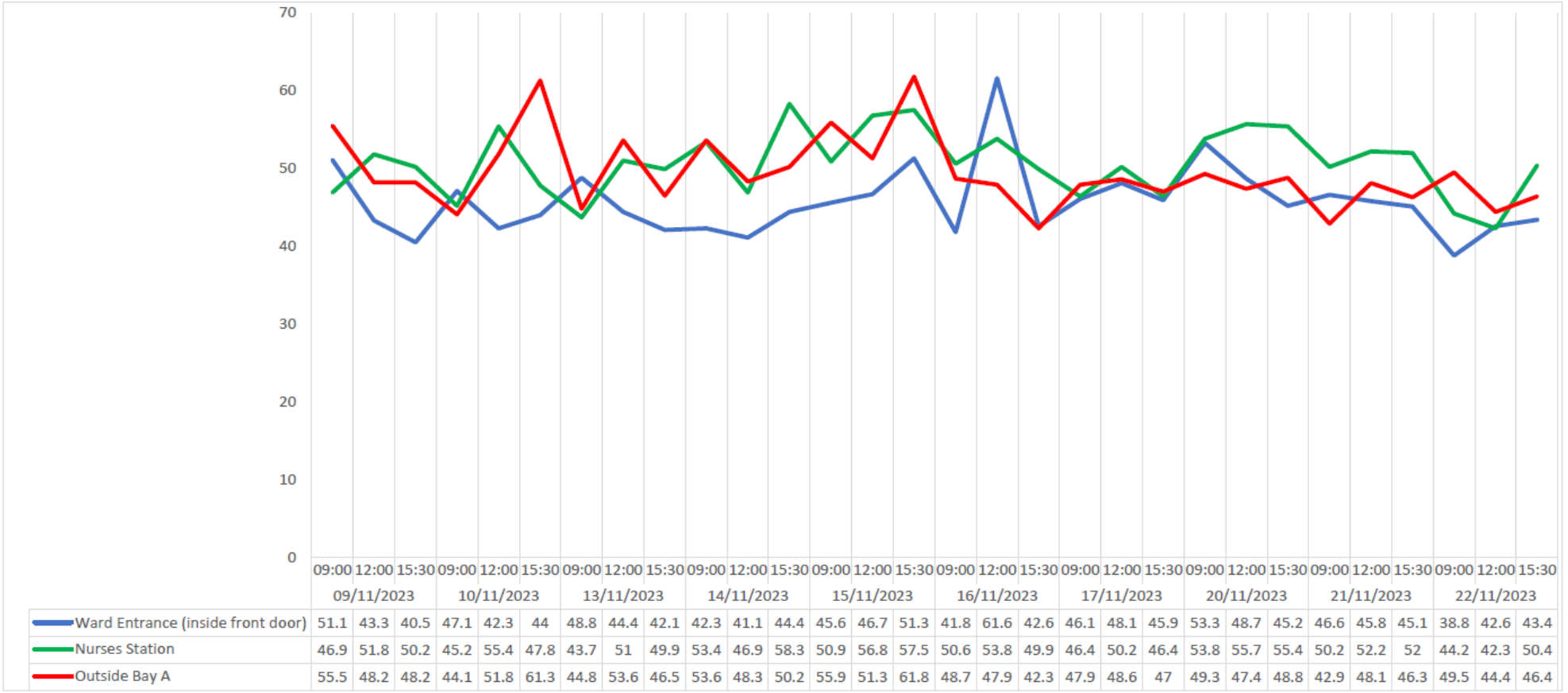
Ward Entrance (inside front door)	73.4	67.4	68.9	63.5	81.9	83.5	68.1	74.5	71.2	61.5	49.8	56.0	75.3	79.0	81.8	72	74.8	58.1	77.8	79.9	72.6	71.1	70.8	66.7	56	59	69.2	68.1	85.1	70.8
Nurses Station	60.5	69.4	69.4	65.5	80.4	70.8	68.1	72.8	65	61.1	69.8	68.3	70.2	80.1	81.6	71.0	72.4	58.1	70.4	73.9	74.6	67.1	79.8	69.1	68	69	72.3	67.7	60.7	70
Outside Bay A	63.3	72.8	61.2	64	66.2	72.5	56.6	65.2	73.4	66.4	70.5	60.9	75.3	66.4	75.9	57.7	65.7	69.8	68.1	78.4	67.9	74.5	71.2	73	60.9	61.4	64.4	77.7	74.9	72.5

Minimum Reading Data



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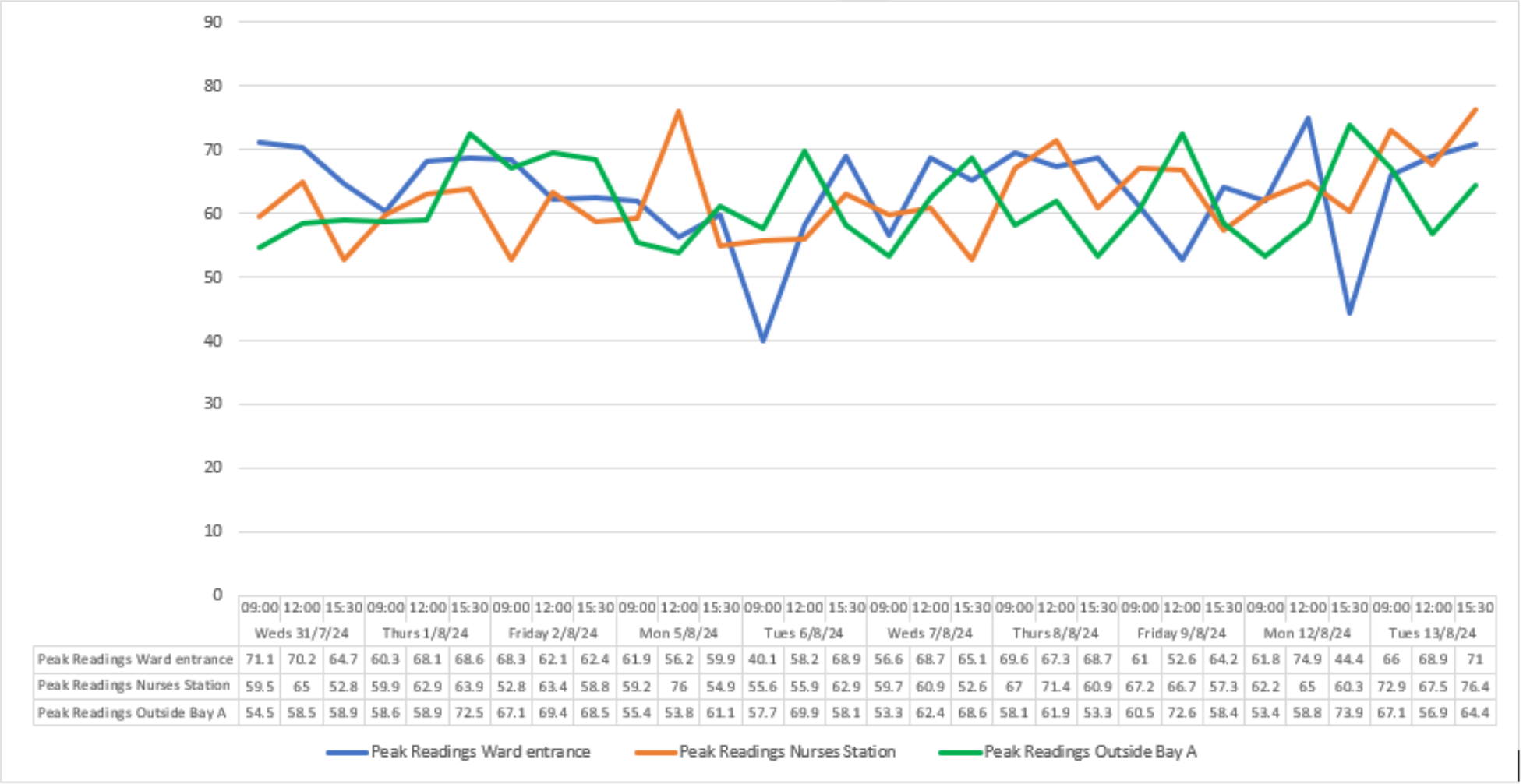
	09/11/2023			10/11/2023			13/11/2023			14/11/2023			15/11/2023			16/11/2023			17/11/2023			20/11/2023			21/11/2023			22/11/2023		
Ward Entrance (inside front door)	51.1	43.3	40.5	47.1	42.3	44	48.8	44.4	42.1	42.3	41.1	44.4	45.6	46.7	51.3	41.8	61.6	42.6	46.1	48.1	45.9	53.3	48.7	45.2	46.6	45.8	45.1	38.8	42.6	43.4
Nurses Station	46.9	51.8	50.2	45.2	55.4	47.8	43.7	51	49.9	53.4	46.9	58.3	50.9	56.8	57.5	50.6	53.8	49.9	46.4	50.2	46.4	53.8	55.7	55.4	50.2	52.2	52	44.2	42.3	50.4
Outside Bay A	55.5	48.2	48.2	44.1	51.8	61.3	44.8	53.6	46.5	53.6	48.3	50.2	55.9	51.3	61.8	48.7	47.9	42.3	47.9	48.6	47	49.3	47.4	48.8	42.9	48.1	46.3	49.5	44.4	46.4

Post Pilot Ward Noise Analysis

Monitoring Period: 31 July to 13 August 2024

Peak Reading Data



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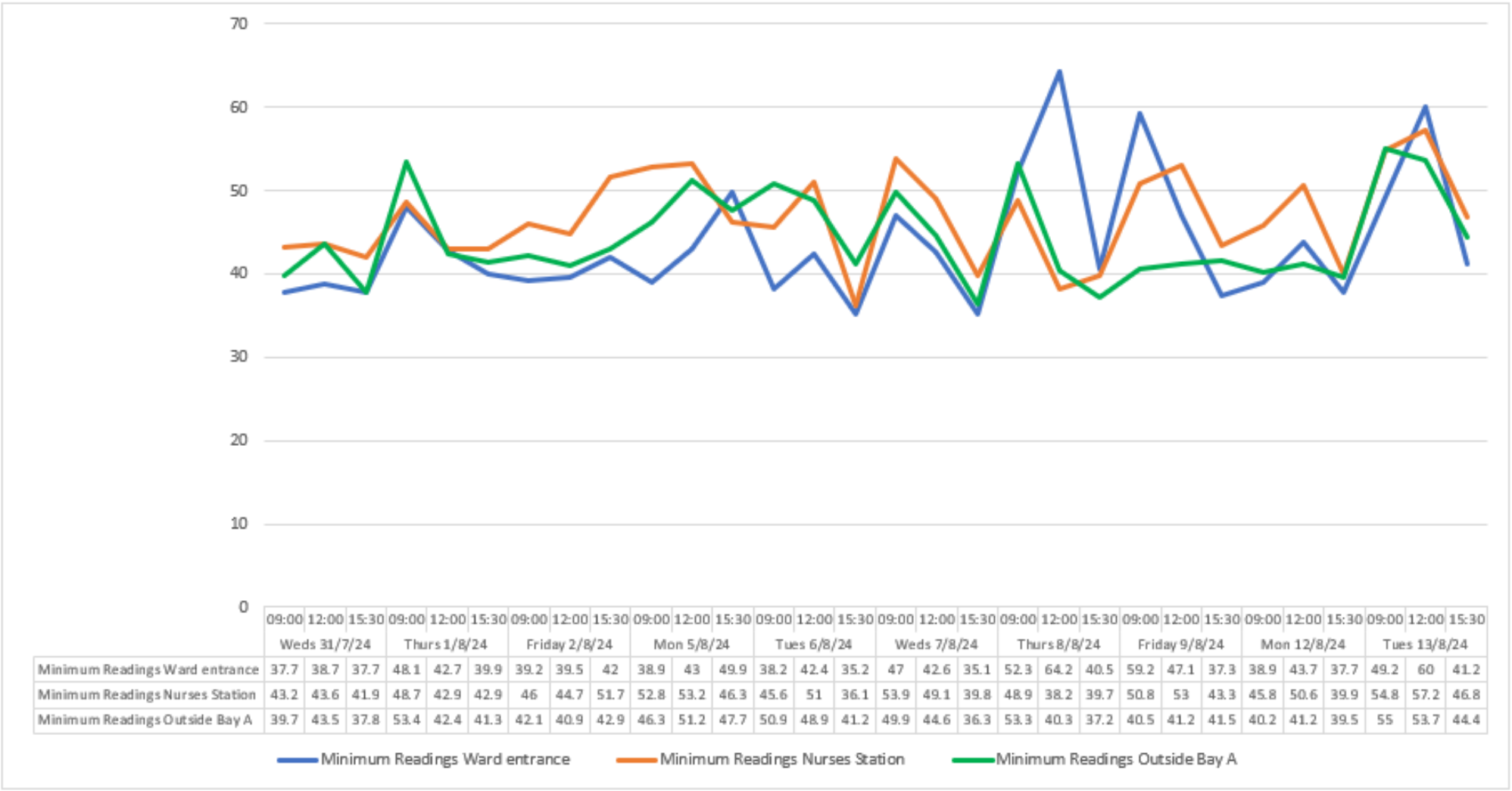
	Weds 31/7/24			Thurs 1/8/24			Friday 2/8/24			Mon 5/8/24			Tues 6/8/24			Weds 7/8/24			Thurs 8/8/24			Friday 9/8/24			Mon 12/8/24			Tues 13/8/24					
Peak Readings Ward entrance	71.1	70.2	64.7	60.3	68.1	68.6	68.3	62.1	62.4	61.9	56.2	59.9	40.1	58.2	68.9	56.6	68.7	65.1	69.6	67.3	68.7	61	52.6	64.2	61.8	74.9	44.4	66	68.9	71			
Peak Readings Nurses Station	59.5	65	52.8	59.9	62.9	63.9	52.8	63.4	58.8	59.2	76	54.9	55.6	55.9	62.9	59.7	60.9	52.6	67	71.4	60.9	67.2	66.7	57.3	62.2	65	60.3	72.9	67.5	76.4			
Peak Readings Outside Bay A	54.5	58.5	58.9	58.6	58.9	72.5	67.1	69.4	68.5	55.4	53.8	61.1	57.7	69.9	58.1	53.3	62.4	68.6	58.1	61.9	53.3	60.5	72.6	58.4	53.4	58.8	73.9	67.1	56.9	64.4			

Minimum Reading Data



	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30	09:00	12:00	15:30
	Weds 31/7/24			Thurs 1/8/24			Friday 2/8/24			Mon 5/8/24			Tues 6/8/24			Weds 7/8/24			Thurs 8/8/24			Friday 9/8/24			Mon 12/8/24			Tues 13/8/24		
Minimum Readings Ward entrance	37.7	38.7	37.7	48.1	42.7	39.9	39.2	39.5	42	38.9	43	49.9	38.2	42.4	35.2	47	42.6	35.1	52.3	64.2	40.5	59.2	47.1	37.3	38.9	43.7	37.7	49.2	60	41.2
Minimum Readings Nurses Station	43.2	43.6	41.9	48.7	42.9	42.9	46	44.7	51.7	52.8	53.2	46.3	45.6	51	36.1	53.9	49.1	39.8	48.9	38.2	39.7	50.8	53	43.3	45.8	50.6	39.9	54.8	57.2	46.8
Minimum Readings Outside Bay A	39.7	43.5	37.8	53.4	42.4	41.3	42.1	40.9	42.9	46.3	51.2	47.7	50.9	48.9	41.2	49.9	44.6	36.3	53.3	40.3	37.2	40.5	41.2	41.5	40.2	41.2	39.5	55	53.7	44.4

Appendix 4

Implementation and Go Live

ID	Task description	Comment	Responsible
Milestone	**Preparations and requirements**	Activity to be carried out before Go Live (Go Live: week 16)	
1			
1.1	Organize user training	Training should include both "theoretical training" using the training material provided, but also practictal training in how to log on to and use the Wheal Fortune pilot application, as described in training doc.	RCH
1.2	Verify users (including starting shift) have completed training, and is well informed of going live and how to going back to audible		RCH/DNVI
1.3	Verifiy users (and starting shift) can logon to the solution both on mobile and web portal		RCH/DNVI
1.4	Check and verify all user access to servers, and system availblity for all parties		
1.5	Remove test/temperary users		DNV Imatis
1.6	Verify phone count and battery status, are phones charged?		RCH/DNVI
1.7	Register Current in-patients at Wheal Fortune in DNV Imatis application.	Note that registration and discharge of patients using DNV Imatis app must be part of practical training.	Superusers at ward
1.8	Site acceptance test has been carried out	Test to be carried out accoring to SAT test plan	DNV Imatis
1.9	Time for initiation of Silent Hospital is agreed/Decided (switching off audible)		DNVI/W
1.10	Verify all nesseray resources is availble at start		RCH/DNVI
1.11	Verify disk and resource capasity as server		DNV Imatis
1.12	Verify log-level on logs (DEBUG) and remove old/unessary logs		DNV Imatis
1.13	Verify sertificate expiration date.		DNV Imatis
Milestone	**Initiating og live - Window start**		
2			
2.1.1	Switch is set to Silent (or Wandsworth is activating it on their end)		Wandsworth
Milestone	**Test and Verification - Window end**		
3			
3.1	Intiate a test signal with escalation.		RCH
3.2	Make note of system responsiveness and lead times as baseline for solution.		DNV Imatis
Milestone	**Completion**		
4			
4.1	Change log-level to normal operation (INFO)		DNV Imatis
4.2	ELS (early life support) period starts		DNV Imatis
4.3			

Royal Cornwall Hospitals
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Appendix 5

Benefits Register

ID	Benefit Title	Benefit Details	Outcome Details	Status	Type	Beneficiary Group	Benefit Owner	Trust Objective	Benefit measure (s) used	Unit of Measure	Baseline	Calculations	Assumptions
SH01	Improve noise levels in Wheal Fortune Ward for the patient as a result of silent call bells, improving patient experience and quicker recovery.	Instead of call bells being audible and noisy, patients and ward staff will use the silent call bell system for patients to raise alarms. This will reduce the noise levels on the ward, improving patient experience and quicker recovery as a result of better sleep, less stress improved breast-feeding adoption and more relaxed babies. **Use better sleep data for tracking**?	Stop using audible call bell system Start using new silent call bell system	Verified	Quality (Non-Financial)	Patients	Kath Bell	Safe, High-Quality Care	Patient Survey Noise level audit General noise level of ward - dB **Patient Experience surveys - % quality of sleep**	Number	54%	% of Patients having a quality night's sleep	Any change in the use of quality of sleep is related to the silent call bell project

SH02	Improve ward environment in Wheal Fortune Ward as a result of silent call bells, reducing the use of temporary staffing i.e. Kernow flex.	Instead of call bells being audible and noisy, patients and ward staff will use the silent call bell system for patients to raise alarms. This will improve the environment for staff to work in thereby reducing the use of temporary staffing i.e. Kernow flex.	Stop using audible call bell system Start using new silent call bell system	Verified	Quality (Non-Financial)	NHS Staff	Kath Bell	Supported and Valued People	Patient Survey Noise level audit Staff experience surveys and workshops **Kernow flex data by month** % of substantive staff on shift	Number	Average of Kernow flex hours used Oct23-Mar24	Hours of Kernow flex staff used	Any change in the use of Kernow flex staffing is related to the silent call bell project
SH03	Improve patient environment on Wheal Fortune as a result of silent call bells, reducing average length of stay.	Instead of call bells being audible and noisy, patients and ward staff will use the silent call bell system for patients to raise alarms. This will reduce noise levels on the ward, resulting in a quicker recover time, enabling a reduction in the average length of stay.	Stop using audible call bell system Start using new silent call bell system	Verified	Non-Cash Releasing (Financial)	Patients	Kath Bell	Safe, High-Quality Care	**Average Length of Stay for Wheal Fortune** **Cost per bed day** **Number of admissions**	Number	Average of ALOS Apr23-Mar24	Total Admissions by month x Total ALOS x bed day cost	Any change in the average length of stay is related to the silent call bell project
SH04	Improve the tracking and recording of call bell response activity, improving performance and accountability.	Instead of using an audible call bell system with limited functionality, the ward will use the silent call bell system to manage alerts. This will provide a comprehensive record of all call bell activity that will drive performance and accountability.	Stop using audible call bell system Start using new silent call bell system	Verified	Quality (Non-Financial)	NHS Staff	Kath Bell	Safe, High-Quality Care	Call bell activity data DNV Imatis - actions taken and escalations ?work out time saved on average per member of staff to produce a financial benefit	Number			Any change in the improvement of performance is related to the silent call bell project

Appendix 6

Media coverage from the pilot project launch

Cornish Stuff – 26 April 2024
Discover How Royal Cornwall Hospitals NHS Trust is Revolutionising Maternity Care with Silent Technology - Cornish Stuff

Nursing Times – 29 April 2024
https://www.nursingtimes.net/news/hospital/cornish-trust-trials-silent-ward-to-boost-postnatal-recovery-29-04-2024/

The Packet Newspapers – 29 April 2024
https://www.falmouthpacket.co.uk/news/24286053.smart-tech-reduce-noise-truro-hospital-wards/

HealthTech News: 02 May 2024
Royal Cornwall Hospitals NHS Trust launches pilot utilising tech to reduce ward noise levels - htn

BBC Online: 04 May 2024
https://www.bbc.co.uk/news/articles/ckdqkk2gvrzo

Digital Health 07 May 2024
https://www.digitalhealth.net/2024/05/digital-health-coffee-time-briefing-134/
https://www.itv.com/watch/news/catch-up-on-itv-west-country-south-west-thursday-7th-november/9695jfx
https://www.bbc.co.uk/news/articles/cwy5v45vykpo

BBC Breakfast 09 December 2024 - Silent Hospital Pilot on Vimeo (not for external sharing)