Study Title: A feasibility study to explore the introduction of a remotely controlled medication issuing machine during the Out-of-Hours period in rural and under-served areas of Wales. The REmote MEdiction maDe easY (REMEDY) study

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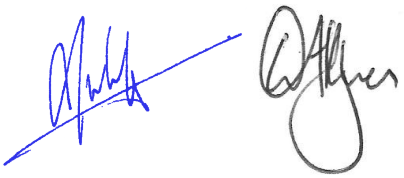
Chief Investigator Signatures:	

The undersigned confirm that the following protocol has been agreed and accepted and that the Chief Investigators agree to conduct the study in compliance with the approved protocol and will adhere to the principles outlined in the Declaration of Helsinki, the Sponsor's SOPs, and other regulatory requirement.

We also confirm that we will make the findings of the study publicly available through publication or other dissemination tools without any unnecessary delay and that an honest accurate and transparent account of the study will be given; and that any discrepancies from the study as planned in this protocol will be explained

All researchers declare that they have no conflicts of interest.

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1. KEY STUDY CONTACTS

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2. LAY SUMMARY

During the evening, overnight, and at weekends (known as the Out-of-Hours period) some people find it difficult to get medications prescribed by a doctor because local pharmacies (chemist shops) are closed, and patients may need to travel long distances or wait until the pharmacies open. This is a bigger problem for those people who cannot travel easily. If they can't start their medications quickly, minor health issues can turn into serious ones, which might need a hospital stay.

Being able to get a medication after a telephone consultation with a doctor during the evening, overnight or at weekends is important for people's health and for avoiding the costs associated with delayed treatment when problems such as infections worsen. This is a big issue in Wales, especially rural areas where there may not be easy access to a pharmacy. We want to find out whether technology, in the form of a medication issuing machine (called REMEDY, for REmote MEdiction maDe easY) could help solve this problem. The machine operates similarly to a vending machine or parcel collection point, but there would be no charge to patients.

We plan to study REMEDY machines, which are being used by the North Wales GP Out of Hours service in Dolgellau and Holyhead, to address such challenges. If the doctor decides

that a patient living in these areas needs a medication after speaking to them on the telephone, the doctor will use a REMEDY machine located near to the patient's home to supply that medication. The patient would be given a code by the doctor which they would enter into the local REMEDY machine. The machine would then release their medication. We want to find out what will work well and what will not work well for patients and medical staff using this machine by watching and talking to them, as well as using information from the machine and routinely collected information held in the Out-of-Hours service records. We will also look at whether the machine provides value for money to the NHS.

Members of the public have already taken part in discussing the problems with getting medications during the Out-of-Hours period and have helped to develop the REMEDY machine. Going forward, members of the public will be invited to be part of groups giving advice to the REMEDY machine project and will help with writing patient facing materials and publications.

We hope that our study of how the REMEDY machine is used will provide an indication of whether it could help to provide medications quickly and safely when the local pharmacies are closed. We'll use the results of this study to help us develop the methods for a larger study looking at the use of the machine in different sites across Wales. We will also write a report, provide tools for organisations who want to use the REMEDY machine in the future, and information for policymakers and companies. We will share this, so that patients, doctors, policymakers and companies can understand what works well and what does not work well about using the REMEDY machine.

3. OVERVIEW

Study Title	A feasibility study to explore the introduction of a remotely controlled medication issuing machine during the Out-of-Hours period in rural and under-served areas of Wales. The REmote MEdiction maDe easY (REMEDY) study
Internal ref. no. / short title	REMEDY HCRW01 / 2833068
Sponsor	Bangor University
Planned Study Period	1 April 2025 to 1 April 2027
Planned Recruitment period	1 September 2025 to 1 January 2027

Research Questions	What are the human, organisational, technological, and regulatory challenges of implementing REMEDY for supplying medication during the Out-of-Hours period in underserved localities, and how might these challenges be addressed? How does implementation of REMEDY impact on patients, parents, guardians, and carers, including in adult social care settings?
Aim	This feasibility study aims to: 1. Explore whether medication issuing machines (REMEDY) have the potential to improve access to medications during the Out-of-Hours period, assessing the impact on service efficiency and workflows 2. Capture user experience in accessing and using REMEDY including the fidelity of use, and feedback into machine and service developments 3. Examine the potential for patient harm arising from the use of REMEDY over standard methods of care 4. Provide a detailed description of the operationalisation of REMEDY in the Out-of-Hour's context and develop methods and resources to optimise this for future rollout, including an understanding of how Developmental Evaluation and the use of the NASSS framework can support innovation within healthcare settings. 5. Inform methods for a future definitive study to assess the effectiveness and cost-effectiveness of implementing the REMEDY machine within the NHS Wales Out-of-Hours service The NASSS framework[2] will provide a theoretical underpinning where appropriate, and the researcher (Dr Rebecca Payne) will be embedded within the health board's implementation team, feeding back emerging insights in line with the principles of Developmental Evaluation[3].

Objectives	1. Explore how/whether Out-of-Hours clinicians use or don't use REMEDY to supply medications and identify any barriers or facilitators to use 2. Establish if fidelity to the intervention is maintained and whether workflows function as expected both for clinicians issuing medication and for patients, parents, guardians, or carers collecting from the machine 3. Explore how patients, parents, guardians, or carers respond to the option of using REMEDY when accessing care Out-of-Hours, including any decisions to decline this option 4. Establish whether patients, parents, guardians, or carers using REMEDY are willing to complete a feedback questionnaire to provide the user experience 5. Explore the acceptability of REMEDY to all stakeholders 6. Examine potential for, or actual, harms associated with REMEDY 7. Identify any modifications (if any) required to optimise REMEDY or the model of use within the NHS Wales Out-of-Hours 8. Estimate the cost-effectiveness of implementing REMEDY, and the value of undertaking further research to establish effectiveness.
Study Design, including methodology	This is a mixed methods study using Patton's Developmental Evaluation, involving iterative cycles of data collection: qualitative interviews with staff and patients (aged 16 years or over), parents, guardians, or carers , ethnographic observation, short surveys, capture of routinely collected usage statistics and OOH service records (from the North Wales GPOOH service). Findings will be fed back to the service throughout the project with a view to optimising and routinising this new technology-supported care model. Analysis will be structured using Greenhalgh's NASSS framework using case study methodology.[1] An economic analysis of REMEDY machines will be conducted using decision analytic modelling to estimate the incremental cost per quality-adjusted life year (QALY) gained compared with standard care. This will be followed by a value of information analysis to estimate the value of undertaking further research.

Study Participants, including sampling strategy	Participants will be a purposive sample of NHS clinicians, administrative, managerial and pharmacy staff, and care home staff, with eligibility determined because of their involvement in implementing the innovation (REMEDY a medicines issuing machine). Patients, parents, guardians, or carers who require medication following a telephone consultation during the Out-of-Hours period, will be invited to complete a survey. A purposive subsample of the survey respondents (aged 16 years or over) will be invited to interview. Members of the local community will be invited to participate in community engagement events.
Committees & Governance	A REMEDY project External Advisory Group chaired by Prof Rachel Elliott, Manchester University will meet every six months to provide oversight and advice. Weekly sprint meetings of Drs Payne and Mackridge and Professor Bond will be held, along with three-weekly research team meetings comprising the full research team, to ensure momentum and progress against the project objectives. Regular Patient and Public Involvement and Engagement (PPIE) meetings will be held to gather views on the project from PPIE representatives, provide input into design of resources, and support interpretation of findings. The Betsi Cadwaladr University Health Board (BCUHB) Research & Development team will provide oversight through regular meetings with the research team.
Student projects	There will be two MSc students (Taron Topham, Racheal Adeosun) and a DPhil (Rebecca Payne, who is also a named investigator through her academic post in Bangor) student working as research assistants on the project and using the data for their MSc dissertations and DPhil theses respectively. All consent forms and participant information sheets will make it clear that the data collected maybe used in this way.

4. ABBREVIATIONS

AL	Archie Lodge
AM	Adam Mackridge
BCUHB	Betsi Cadwaladr University Health Board
BU	Bangor University
CB	Christine Bond
CPhO	Chief Pharmaceutical Officer
DH	Dyfrig Hughes
GP	General Practitioner
GPOOH	North Wales GP Out-of-Hours
HRA	Health Research Authority
ICF	Informed consent form
ID	Identification document
IRAS	Integrated Research Assessment System
MSDIT	Medical Sciences Division Information Technology
NDPCHS	Nuffield Department of Primary Care Health Sciences
NHS	National Health Service
PI	Principal Investigator
PIS	Participant/ Patient Information Sheet
PPI[E]	Patient and Public Involvement [and Engagement]
RA	Racheal Adeosun
R&D	NHS Trust R&D Department
REC	Research Ethics Committee
RES	Research Ethics Service
RP	Rebecca Payne
TT	Taron Topham

5. BACKGROUND AND RATIONALE

5.1. Introduction

This mixed methods feasibility study will use a translational approach to evaluate the delivery of a socio-technical innovation, the REMEDY machine, to test the feasibility of its implementation in an Out-of-Hours (OOH) setting and inform future research exploring its effectiveness and efficiency. As such this project will provide insights into the acceptability of REMEDY to all stakeholders, confirm data sources and data collection methods for future

research, and identify other current areas of uncertainty around optimal implementation. It will lead to the development of a toolkit that providers can use in the future to support the implementation of the innovation, an estimation of the value of undertaking further research, and the design of a protocol for a future multisite study in Wales and beyond. This project will put Wales at the leading edge of a potential technological revolution in how urgently required medicines are accessed during the Out-of-Hours period.

5.2. Why is this research needed now?

It was recognised as early as 1939 that tele-consultations were of limited use if patients were unable to access the medicines recommended on the call[4]. Many decades on, despite a rapid expansion in the remote delivery of consultations, the physical infrastructure required to support rapid access to urgently required medicines for patients remains underdeveloped. In Wales and other parts of the UK, this situation is worsening due to the closure of some community pharmacies and reduced opening hours of others[5]. This is particularly affecting the Out-of-Hours period and has greatest impact in rural and remote areas. The increased percentage of calls managed purely by phone[6], and the well documented difficulties finding clinical staff willing to work in remote areas[7] mean this challenge is rapidly becoming a crisis.

Tele-consultations are no longer delivered by radio as they were in 1939 but now use telephone and video assessments. They are convenient for patients[8], have an excellent safety record[9] and enable patients to receive a prompt assessment from home, something particularly valued when people are feeling unwell. They mean clinician time can be used effectively and efficiently and allow services to be delivered to a wide geographical area by a small cohort of staff, often physically located some distance from the patient.

For many conditions, a delay in starting medicines is acceptable, making pre-existing supply options like postal and courier services suitable. However, for acute conditions such as infections, exacerbations of chronic conditions such as asthma and COPD, or where emergency contraception is required, prompt commencement of treatment can have an important impact on course of the condition and perhaps prevent hospital admission. Delays in starting urgently needed medicines such as steroids[10] and antibiotics[11], risk increasing morbidity, mortality, and costs further down the patient care pathway, as well as providing a poor patient experience.

Knowing this, many Out-of-Hours organisations already put considerable inefficient resource intensive efforts into getting medicines to patients in a timely fashion. Patients and clinicians are routinely faced with a stark choice between implementing expensive or risky workarounds, or delaying treatment, risking the condition worsening. Our team has personally seen the negative effects of this, from unwell patients making long car journeys,

to clinicians being diverted away from other patients' care to deliver medicines, and even (in a Scottish island context) to medical evacuation by helicopter to facilitate treatment of problems, such as constipation, which could have been managed easily in the community with medicines. Aside from the obvious clinical consequences, there are also societal factors, since poor access to urgently required medicines is more common amongst communities with reduced access to transport, complex care needs, or for patients with limited social networks, and this exacerbates existing inequalities, disadvantages rural communities and discriminates against the poor[12]. It risks health services breaching national policies such as commitments made in "A Healthier Wales"[13] and undermines the World Health Organisation's goal of "Health for all"[14].

In July 2024, the North Wales GP Out-of-Hours (GPOOH) service installed the first REMEDY machine, which is a medication issuing machine preloaded with a selection of medicines from the Out-of-hours formulary. This includes medicines such as steroids and antibiotics, which are commonly prescribed following a telephone consultation during the out of hours period. This machine is the first such machine in Europe, and was adapted by the NHS, our research team, and Videosystems, from existing hardware that is currently used for collection of dispensed medication in community pharmacy settings.

5.3. The research gaps

There is a significant research gap which this project will fill. Below we detail the steps we have taken to review the previously published research. Our paper on the international options for medicine supply after a teleconsultation published in the British Journal of General Practice[15] explores current options including rescue packs for people with known conditions like asthma, anticipatory prescribing in palliative care, and medicines chests which are held by community volunteers and drones.

Although rescue packs and anticipatory care planning can benefit some patients, their provision is contingent on well-functioning and proactive primary care services. These areas are under strain world-wide. Furthermore, such solutions have little value in unanticipated deterioration or medical need. Medicines chests can benefit smaller communities, and are particularly useful in very remote settings, but can risk patient confidentiality, and require significant and resource intensive oversight making them impractical in the Welsh setting. Combining medicine chests with a healthcare support worker to issue medicines may work in low-income settings, but in settings like Wales, challenges in recruitment, and the ensuing wage bills are likely to make this option unaffordable and undeliverable. Technology, such as that employed in REMEDY, has promise in a Welsh setting and, if proven effective, has the potential to be scaled up quickly and comparatively cheaply, potentially redressing some of the inequality in access to healthcare that currently exists in Wales and elsewhere.

5.4. Relevant literature on evaluating innovations in healthcare

Medication issuing machines like REMEDY are used in North American settings and may provide an example of the model that we want to test in Wales. However, introducing a new technology into a different country and setting isn't as simple as plugging in a new machine; it requires complex change in organisational workflows, and may not be acceptable to patients, parents, guardians, or carers and wider stakeholders.

There are several techniques that can be used to study such innovations within the healthcare setting. We decided to use Developmental Evaluation[16], where the researcher is embedded within the project implementation team, feeding in insights so the project can adapt iteratively to address identified challenges, alongside the NASSS[2]. The NASSS framework was designed to study the introduction of technology to healthcare settings and has been widely used in similar evaluations. It sits within the feasibility stage of the MRC framework for developing complex interventions[17], providing support to understand the complexities surrounding health technologies. NASSS also aids an in-depth analysis of the technology itself, including the infrastructure required to support it, and the interactions between the technology and users[18]. The NASSS framework also considers the broader context in which the technology is implemented, including the organization, the wider system, and societal level factors. Innovation does not happen in a vacuum so taking this holistic approach will help develop understanding of what makes the innovation succeed or fail, helping with the translation to other healthcare settings.

By categorising the complexities involved in healthcare technology innovations into several domains, such as the condition or illness, the technology, the value proposition, and the adopter system, the NASSS framework[2] provides a structure for identifying and addressing specific barriers to implementation and sustainability and complementing the feasibility objectives[19].

Dr Payne works closely with the author of the NASSS framework, Professor Trisha Greenhalgh, University of Oxford and has access to support and advice on its application.

5.5. Feasibility

The MRC framework provides guidance on feasibility study design, including on the benefits of economic evaluation and modelling[19]. These principles have been used to inform the design of this study.

5.6. Summary of Background

Relevant contextual information:

- Accessing medicines following a telephone consultation during the Out-of-Hours period is becoming ever more challenging. This is due to reduced opening hours, and increasing closures, of community pharmacies, particularly in areas of low population density when the resources needed to maintain historic service models are no longer justified. This is resulting in significant rural inequalities in access to medicines, risking worsening health outcomes for populations in these areas.
- Out-of-Hours medical services are operating from fewer bases, with no clinicians routinely based in the study areas of Dolgellau or Holyhead. The resource needed to maintain these local services is no longer justifiable with modern working practices.
- Centralisation of services is leading to greater distances between the clinicians who manage patient care, the patient themselves, and a point for supply of dispensed medicine through traditional service models.

Things we know from the literature:

- Getting medicines to patients in a timely fashion is important.
- Current workarounds are suboptimal for patients, parents, guardians, carers, clinicians, and services, are inefficient and can risk safe care.
- Internationally, a range of solutions have been developed for this problem, none of which optimally meet patient needs for medication access in the Welsh context.
- Medication issuing machines such as REMEDY may be helpful in addressing this issue but need to be evaluated to avoid inappropriate investment in new technology.
- The NASSS framework is a suitable way to evaluate the introduction of a new technology such as the REMEDY machine within a health care setting.

Things we don't know:

- Will a medication issuing machine (REMEDY)?
    - provide a technological solution to improving access to urgently required prescribed medicines in Wales?
    - be acceptable to, and usable by, communities, patients, parents, guardians, carers, clinicians, and wider stakeholders?
    - fit within the processes of the Welsh Out-of-Hours services?
    - be cost effective for the supply of urgently required medication during the Out-of-Hours period?
- What is the value of undertaking further research; and can a protocol be designed to evaluate the clinical and cost effectiveness of the REMEDY machine in a future definitive study.

How this project will fill the research gap:

- This project aims to explore whether a remotely controlled medication issuing machine (REMEDY) could be used to supply urgently required medication during the Out-of-Hours period in Wales.

- As a feasibility study it will inform a future definitive study to assess the effectiveness, efficiency and safety of introducing medication supply machines Wales-wide.
- The project is the first phase of a programme of work to fill the research gap.

6. AIM, RESEARCH QUESTIONS & OBJECTIVES

6.1. Aim

We will be undertaking a feasibility study which aims to:

1. Explore whether medication issuing machines (REMEDY) have the potential to improve access to medications during the Out-of-Hours period, assessing the impact on service efficiency and workflows
2. Capture user experience in accessing and using REMEDY including the fidelity of use, and feedback into machine and service developments
3. Examine the potential for patient harm arising from the use of REMEDY over standard methods of care
4. Provide a detailed description of the operationalisation of REMEDY in the Out-of-Hours context and develop methods and resources to optimise this for future rollout
5. Inform methods for a future definitive study to assess the effectiveness and cost-effectiveness of implementing the REMEDY machine within the NHS Wales Out-of-Hours service

The NASSS framework[2] will provide a theoretical underpinning where appropriate, and the researcher (Dr Rebecca Payne) will be embedded within the Health Board's implementation team, feeding back emerging insights in line with the principles of Developmental Evaluation[3].

6.2. Research Questions

What are the human, organisational, technological and regulatory challenges of a medication supply machine solution for supplying Out-of-Hours medication in underserved localities, and how might these challenges be addressed?

How does implementation of REMEDY impact on patients, parents, guardians, or carers, including in adult social care settings?

6.3. Objectives

1. Explore how/whether Out-of-Hours clinicians use or don't use REMEDY to supply medications and identify any barriers or facilitators to use

2. Establish if fidelity to the intervention is maintained and whether workflows function as expected both for clinicians issuing medication and for patients, parents, guardians, or carers collecting from the machine
3. Explore how patients, parents, guardians, or carers respond to the option of using REMEDY when accessing care Out-of-Hours, including any decisions to decline this option
4. Establish whether patients, parents, guardians, or carers using REMEDY are willing to complete a feedback questionnaire to provide the user experience
5. Explore the acceptability of REMEDY to all stakeholders
6. Examine potential for, or actual, harms associated with REMEDY
7. Identify any modifications (if any) required to optimise REMEDY or the model of use within the NHS Wales Out-of-Hours service
8. Estimate the cost-effectiveness of implementing REMEDY, and the value of undertaking further research to establish effectiveness.

7. METHODS

7.1. Study design

This is a mixed-methods feasibility study using developmental evaluation, case study methodology and the NASSS framework in two contrasting localities; Dolgellau (a predominantly rural agricultural community with limited levels of deprivation and high levels of tourism) and Holyhead (a port town, with comparatively high levels of deprivation, and significant nearby tourist areas). The study will be conducted from September 2025 to April 2027.

7.2. Participants

The study participants will include staff involved in using or supporting the REMEDY machine, patients, parents, guardians, or carers (including social care staff) receiving their medicines from REMEDY, regional and national stakeholders, and members of the communities in Dolgellau and Holyhead.

7.3. Eligibility

7.3.1. Inclusion Criteria

i. Patients, parents, guardians, or carers, who have been allocated medication via the machine
ii. Community members who choose to take part in community engagement events
iii. NHS Staff who have been involved in the implementation or use of the machine
iv. Stakeholders with an interest in getting urgently required medication to patients will

be eligible. These will include representatives from Welsh government, the Royal Pharmaceutical Society, Community Pharmacy Wales, the Royal College of GPs, and British Medical Association.

v. Industry representatives involved in developing and/or distributing the machine

7.3.2. Exclusion Criteria

i. NHS staff who have not been involved in the project,
ii. Stakeholders who are not involved with or able to influence the provision of urgently required medication.
iii. Patients, parents, guardians, or carers who do not consent to participate

7.4. Data collection

The table below summarises the sampling frame and data collection for each element, with more details provided in the text which follows. For the qualitative aspects of the study the numbers of patients, parents, guardians, or carers and staff to interview have been selected based on achieving saturation using standard feasibility study approaches[20]. Numbers will be increased where possible to reach saturation. Data will be collected over an 18-month period from September 2025, dependent on ethics and NHS R&D approvals.

Focus	Participants	Method	Data to be collected
Patient and carer user experience and views	All patients, parents, guardians, or carers from each site who choose to answer the survey automatically texted to them by the machine software. Target 200 participants.	Survey automatically texted to patient by the machine. Closed and free text questions, based on items used in previous studies. Survey questions included in Appendix 1 (Version 1; date 22/07/2025)	Medical condition leading to use of the machine, ease of use, adverse outcomes or challenges from collecting their medicines via the machine, subsequent use of other health services, out of pocket expenses.

Focus	Participants	Method	Data to be collected
Patient/carer interviews	10 at each site, sub-set of survey responders willing to be interviewed, sampled purposively for diversity of age, gender, socio-economic status, medical condition(s) and role (e.g., patient, parent, guardian, or carer)	Semi-structured interviews by phone or video call. Draft interview schedule included in Appendix 2 (Version 2; date 22/7/2025)	Impact of using the machine for patients, parents, guardians, or carers and their experiences of it (increased depth of data than survey).
GPOOH and Health Board pharmacy, clinical and admin staff experience and views	10 participants across the two sites, sampling a range of different clinical, pharmacy, administrative and support staff	Semi-structured interview, by phone or video call. Draft interview schedule included in Appendix 1 (Version 1; date 22/07/2025)	Attitudes towards the machine, impact on work/workflows, concerns and positives, examples of harm or near-misses, ideas for improvement.
Stakeholder interviews	Regional stakeholders: 5 linked to each site, using snowball sampling National stakeholders: 5 purposively sampled senior stakeholders e.g., CPhO, CMO, national OOH leads, professional bodies, etc.	Semi-structured interview, by phone or video call. Draft interview schedule included in Appendix 2 (Version 2; date 22/07/2025)	Regional, national, or industry context; hopes and concerns; perceived potential for harm or benefit.

Focus	Participants	Method	Data to be collected
	Purposive sample of 10 pharmacy staff draw from BCUHB, community pharmacies and stakeholder organisations such as Community Pharmacy Wales and recruited through professional networks of the research team.	Semi-structured, by phone or video call. Draft interview schedule included in Appendix 2 (Version 2; date 22/07/2025 *Conducted by MSc Student Racheal Adeosun, who is a practicing community pharmacist*	Attitudes towards the machine, views and experiences of the medicines machine, any impact on work/workflows, concerns and positives, examples of harm or near-misses, and ideas for improvement.
Experience and views of social care staff	Eitther three focus groups with up to 5 care home in each, or up to 15 semistructured interviews depending on feasibility. Including managers, nursing staff and support workers. Recruited via professional networks of local pharmacy teams.	Focus groups conducted via Microsoft Teams (MS Teams) Draft focus group schedule included in Appendix 3 (Version 2; date 22/7/2025) Semi-structured, by phone or video call. Draft interview schedule included in Appendix 2 (Version 2; date 22/07/2025 *Conducted by registered nurse and MSc student Taron Topham*	Challenges faced obtaining medicines in OOH period, views on the REMEDY machine, experiences of use.

Focus	Participants	Method	Data to be collected
Community views	Attendees at two community meetings in each of Dolgellau and Holyhead (total 4 meetings)	Field notes recorded during observations from each public meeting facilitated by the BCUHB engagement team. Carried out at Commencement and Post-Implementation stages.	Commencement: Current challenges to medicines access faced by the community; views of the prospect of new care model. Post-implementation: Experiences of using the machine; impacts on patients, parents, guardians, or carers, and the wider community, etc.
Operational use and management of the machine	All consenting clinical and administrative staff working in the 111 National Clinical Support Hub and GP OOH call centres who are providing or assisting delivery of clinical care within around 10 hours of observation	Field notes recorded during observation within OOH call centres and 111 National Clinical Support Hub (including any information gathered through discussions/where clarifying questions were asked)	Understanding of how the new technology fits into wider workflows; challenges or enablers for use of the machine; workarounds used to support patients, parents, guardians, or carers with access to medicines; other pertinent information relevant to the implementation and use of the machine
	All consenting health board staff involved in wider delivery of the care model – staff involved in implementing the machine and managers and other staff responsible for its operation – within around 100 hours of observation	Field notes recorded during observations of implementation group meetings, and other operational tasks associated with the machine (e.g., restocking) Notes will include any information gathered through discussions/where clarifying questions were asked	Understanding of how the new technology fits into wider workflows; challenges or enablers for use of the machine; other pertinent information relevant to the implementation and use of the machine

Focus	Participants	Method	Data to be collected
Operational use of the machine, clinical incidents, and missed opportunities for use	None – this routinely collected data will be anonymised by OOH staff before it is shared with the research team	[a] Machine logs showing type, date, and time of medication issue/collection. [b] Adastra case records from advice calls where medication was issued in the area around the machine. All data anonymised [c] Datix logs related to medication collection.	What was supplied, when and why; when the machine wasn't used and potential barriers to use; any safety concerns or other clinical incidents in relation to medicines access.
Efficiency and workflow data	Up to 5 pharmacy team members involved in restocking the machine	Time and motion study, spreadsheet completed by each staff member involved with the machine over a 1-week sample period undertaken when the processes associated with the implementation of the REMEDY machine are in steady state.	Time spent on activities associated with the machine – to aid health economic assessment

7.4.1. Patients, parents, guardians, or carers survey

The machine will send an automatic text link to a Microsoft Forms survey to all patients, parents, guardians, or carers using the machine. The survey will include a brief explanation of its purpose and a statement that completion of the survey will be taken as implied consent. The survey will be based on the one used with patients in an earlier tele-pharmacy study led by co-applicant Professor Bond[21]. It has been adapted to address the objectives of this study with sections capturing views and experiences of using REMEDY (closed questions, Likert scales and open text responses). Demographic questions will be asked, with "prefer not to say" options (age, gender, ethnicity, socioeconomic status (based on first 4 digits of postcode) and medical condition) to inform the subsequent purposive sampling of interviewees. Participants will also be asked how they would have accessed medicines if the machine had not been available locally, their use of healthcare services, and any out-of-pocket expenses incurred (or saved). The final question will ask if they would be willing to

take part in an interview. The questionnaire will be offered in Welsh and English and piloted in both languages on a small sample of early users. Questions to be used in the survey are available in Appendix 1 (Version 1; date 22/07/2025)

7.4.2. Interviews & Focus Groups

7.4.2.1. Consent

Potential participants will be advised that individual interviews will take a maximum of 1 hour and focus group a maximum of 2 hours. Written and verbal versions of the Participant Information Sheet (PIS) and Consent Form will be provided to the participants prior to recruitment to interviews and focus groups detailing: the exact nature of the study; what it will involve for the participant; any risks involved in taking part. The researcher will clearly state that participation is voluntary, and that the participant is free to withdraw from the study at any time for any reason without prejudice to future care or affecting their legal rights, and with no obligation to give the reason for withdrawal. Information will be provided in English and Welsh. Copies of consent forms are available in Appendix 4 (Version 2; date 22/7/2025).

There will be two mechanisms employed for collection of consent for interviews and focus groups:

1. Participant signs a consent form (which has been emailed or sent to them by standard post, to be returned to the research team via email or in a stamped addressed envelope); or
2. Participant consents verbally (by telephone or on Teams, which will be audio recorded with the consent form initialled by the researcher and a copy of the consent form emailed or posted to the participant).

In either case, consent will be re-confirmed verbally at the start of each session. Individuals taking consent will have up to date with research governance training and be authorised to do so by the Principal Investigator.

All interviews will be digitally audio recorded and auto-transcribed with subsequent checking of veracity of transcription against the original recording being carried out by one of the research team.

7.4.2.2. Patient, parent, guardian, and carer interviews

Patients, parents, guardians, or carers who indicate their willingness to be interviewed in the survey (see above), and are aged 16 years or over, will then be purposively sampled for diversity of age, gender, socioeconomic status and medical condition(s) using information collected in the survey. Those selected will be sent an invitation pack (via email/post, using the contact details supplied in the survey) comprising invitation letter (Appendix 10; Version 2 date 22/07/2025), participant information leaflet (Appendix 11; Version 2; date 22/7/2025)

and consent form.

Semi-structured interviews will be offered in either English or Welsh and conducted by Dr Payne according to interviewee preference (Welsh interviews will be conducted with simultaneous translation). Potential interviewees will be contacted by Dr Payne to arrange a mutually convenient date and time. It is anticipated that most will be conducted virtually, but patients, parents, guardians, or carers will be offered the opportunity of a face-to-face interview. We anticipate that ten people will be interviewed per site, but sampling will continue until saturation is reached. Interviews will be guided by an interview schedule (Appendix 3 Version 2; date 22/7/2025) with high level areas of enquiry to address the study objectives with probes to be used as needed. These will include issues of equitable access, the relative ease of accessing and using the machine for people from different socio-economic backgrounds, any experiences of harm from using the machine, and subsequent use of health services for this episode of care, and whether the patient would recommend the use to friends and family.

Patient, parents, guardian, or carer participants in interviews will be offered their choice of a £25 Amazon or M&S voucher in recognition of the time taken in participating.

7.4.2.3. Clinical, Pharmacy and Administrative Staff Interviews

Purposive sampling of Out-of-Hours and 111 National Clinical Support Hub staff will be undertaken to select individuals from each site to cover a range of disciplines e.g., pharmacists, administrator, GP, nurses etc. Pharmacy staff involved in restocking the machine will also be sampled on a similar basis. We anticipate that approximately 10 staff interviews will take place, but sampling would continue until theoretical saturation is reached. With the support of the operational lead for Out-of-Hours services and Dr Mackridge's own links with the pharmacy team, these staff will be approached via email and invited to take part in an interview via Teams. They will be sent a copy of the participant information sheet (Appendix 6 Version 2; date 22/7/2025) and a consent form and given a week to think about it prior to an interview.

Interviews will be carried out by Dr Payne and guided by an interview schedule (Appendix 3 Version 2; date 22/7/2025) with high level areas of enquiry to address the study objectives with probes to be used as needed. Questions will include experiences of using the machine and whether they have encountered any examples of patient harm, or have concerns regarding potential for harm, because of usage.

7.4.2.4. Regional and National Stakeholder Interviews

Stakeholder mapping[22] will be carried out to identify the most relevant stakeholders to interview at regional and national level. Purposive sampling will be used to identify five

stakeholders to be interviewed regionally and five nationally. Regional stakeholders are likely to local Senedd members, councillors, in-hours GPs, and voluntary sector agencies such as the Red Cross, and national stakeholders are likely to include individuals such as the Chief Pharmaceutical Officer, Representatives of the Royal Pharmaceutical Society and Royal College of General Practitioners, and Chair of the All Wales Out-of-Hours Forum. Stakeholders will be approached via email and via professional networks. They will be sent a copy of the participant information sheet (Appendix 6 Version 2; date 22/7/2025) and a consent form and given a week to think about it prior to consenting to an interview.

Interviews will be carried out by Dr Payne and guided by an interview schedule (Appendix 3 Version 2; date 22/7/2025) that includes questions on their experiences of medicines access, concerns about unintended consequences and views on using the machine to collect urgently required medication

7.4.2.5. Pharmacy Stakeholder Interviews

A purposive sample of approximately ten pharmacy staff will be recruited from Health Board staff, community pharmacies, and stakeholder organisations such as Community Pharmacy Wales, using the professional networks of the research team. Potential participants will be contacted via email and provided with a Participant Information Sheet (Appendix 6 Version 2; date 22/7/2025) and Consent Form. They will be given at least one week to consider participation before taking part in a semi-structured interview conducted via telephone or video call.

Interviews will be conducted by Racheal Adeosun, an MSc student and practising community pharmacist. A draft interview schedule is included in Appendix 2 (Version 2; date 22/07/2025). Discussions will explore attitudes towards the medicines machine, views and experiences of its use, perceived impacts on work and workflows, concerns, examples of harm or near misses, and suggestions for improvement.

7.4.2.6. Care Home Staff Focus Groups

Up to three focus groups, each comprising five participants, will be conducted by registered nurse and Oxford University MSc Student Taron Topham. Purposive sampling of care homes around Dolgellau will be undertaken with the assistance of health board staff. Care home staff will be approached directly via email and through professional networks. They will be sent a copy of the Participant Information Sheet (Appendix 16 Version 2; date 11/6/2025) and a Consent Form and given a week to think about it prior to taking part in a focus group exploring issues around obtaining urgently required medication and use of the machine.

Focus groups will be structured by staff group e.g., care home managers, nurses and support staff. The focus groups will be conducted via Microsoft Teams. A topic guide based on the

NASSS framework will be used to guide discussions (Appendix 3 Version 2; date 22/6/2025).

If it is unfeasible to conduct focus groups (e.g. if the technology for joining a Teams call is not available in the care home, semi-structured interviews will be conducted by telephone or Teams with individual members of staff using interview guide in Appendix 2 (Version 2; date 22/07/2025

7.4.3. Community Events

We will hold two public meetings in each of the Dolgellau and Holyhead communities to explain the project to residents and to ascertain their views on the current access to medicines Out-of-Hours and perceptions of the REMEDY machine. The first meeting to be held in September 2025 will concentrate on their current experiences and challenges in relation to medicines access during the Out-of-Hours period, and the second in January 2027 seeking their current views to understand if the REMEDY machine has alleviated such supply challenges. Each session will be advertised to the local community via posters/social media posts and via local media networks such as local radio and community newsletters, and with the support of the BCUHB engagement team, who have strong links with local community groups and organisations. It will be made clear in advertisements that the information gathered during the meeting will be used in the research project, but that no comments would be attributed to any one individual. This will also be reconfirmed at the start of the meeting.

On entry to the meeting, attendees will be advised that notes will be captured and if they do not want their comments recorded verbatim to state this when commenting and/or make their wishes known to the researchers at the event. Care will be taken in note taking to minimise the risk that the individual would be identifiable e.g., recording approximate age and gender rather than participants name when notetaking. Field notes describing the discussions will be taken and the data from these will be analysed thematically and included in the final collated study dataset.

7.4.4. Ethnographic observations

All ethnography will be carried out by Dr Payne, who is a registered General Practitioner and Clinical Senior Lecturer at the North Wales Medical School Bangor University. Dr Payne also has an honorary contract with Betsi Cadwaladr University Health Board.

7.4.4.1. Observation of Operational Meetings and Implementation Meetings

Observations will be conducted during Out-of-Hours (OOH) Operations meetings, where operational issues are discussed, and the BCUHB REMEDY Implementation Group meetings, where progress with the implementation of REMEDY is discussed. Both meetings take place via Microsoft Teams.

Prior to the start of the study, a Participant Information Sheet (Appendix 12 Version 1; date 22/7/2025) will be distributed to all staff likely to be involved in these meetings. This document will explain that a researcher may be present at any REMEDY-related meeting, that notes will be taken, and that Teams recordings, along with meeting papers (such as minutes and supporting documents), may be used for research purposes. It will also advise that any staff member who does not wish their comments to be included in the study should inform the researcher at any time up to the point of data analysis. The researcher will keep a record of such requests and ensure that any related comments are excluded from the analysis.

Dr Payne will introduce herself as an academic researcher during meetings and will remind participants that information shared during the meeting may contribute to the study dataset. While individual staff cannot be excluded from the general observation of group meetings, no data will be recorded or used in relation to any individual who has requested exclusion.

Manual notes will be taken during meetings and developed into formal field notes, aiming to capture 'thick description' for the ethnographic dataset. The dataset will include MS Teams recordings, handwritten field notes, meeting papers, and meeting minutes. Brief clarifying conversations may be held with team members to support contextual understanding; verbal consent will be obtained and documented at the beginning of any such exchanges intended for inclusion in the research.

7.4.4.2. Observation in the Out-of-Hours Call Centre or 111 National Clinical Support Hubs

Dr Payne will be present at the OOH call centre during the operational period including handovers in order to carry out ethnographic observations. This will cover evening, and weekend shifts when the machine is most likely to be used. Staff will have been advised that this observation is part of study procedures in the Participant Information Sheet (Appendix 12 Version 1; date 22/7/2025) circulated to all staff prior to the study start. In addition, posters will be displayed informing the staff of a researcher's presence (Appendix 13 Version 1; date 22/7/2025). Both the Participant Information Sheet and the posters will advise staff on how they can opt out of observations through wearing a sticker, provided on the poster. During the operational period the researcher will sit next to the shift lead in the call centre and observe staff using the software interface for the REMEDY machine in real time. Brief clarifying discussions may be held with staff during Out-of-Hours shifts as part of this ethnography with verbal consent being taken and recorded at the start of any notes taken to be included in the research. These will not be audio recorded but notes will be made by the researcher. Other operational activity associated with the use of the machine may also be observed to aid in understanding of the use and impact of the machine on workflows. In these cases, any individuals who are observed will have the project explained to them and

given the opportunity to opt out of observation, in which case, no field notes will be made in respect to any activity involving them.

7.4.5. Routinely collected data

As part of the implementation of REMEDY, health services staff routinely perform the following monthly searches:

1. Machine logs showing type/date/time of medicine issue/collection.
2. OOH Adastra case records identifying cases where medication was issued to a patient living near the location of a REMEDY machine (regardless of whether it was via the machine or not) and patients with sentinel* conditions where machine usage might have been appropriate (regardless of whether medication was issued or not). This data is used by the health board implementation team to understand usage.
3. Datix logs related to medicines collection.

This routinely collected data will be anonymised and extracted into an Excel spreadsheet by OOH staff before it is shared with the research team. The data shared will consist of the date, time the case was received, the time the case was closed, first 4 letters of postcode, medication received, Adastra number of case, patient age, patient gender, and anonymised free text notes of consultation made by the consulting clinician.

The anonymised REMEDY machine logs shared with the researchers will contain the date, time and type of medicines issued from the REMEDY machine including the Adastra case number. Error logs will also be obtained e.g., any REMEDY machine downtime, failure to send SMS message, etc.

All Datix reports and investigations related to medicines supply and access in the North Wales GPOOH will be anonymised by Health Board staff before sharing with the research team to include in the study. This will allow identification of harms arising from the use of REMEDY, as well as harms arising from existing supply mechanisms. In addition, the interviews with staff, patients, parents, guardians, and carers will also ask specifically about examples of harm to identify any examples which did not enter the Datix system.

7.4.6. Time and Motion study to inform the Heath Economic analysis

A time and motion study is a quantitative data collection method used to systematically record the duration and type of activities involved in specific tasks or procedures performed by healthcare staff. In the REMEDY project, its primary purpose is to capture the human resources associated with the stocking, management and maintenance of the REMEDY

* Sentinel conditions are those defined by the research team as most likely to be appropriate to manage remotely, and where medicines that are stocked in the machine are appropriate for management.

machine. These data will be used to estimate overall costs, as well as help identify inefficiencies and optimise workflows. By breaking down activities into discrete steps and timing each component, these studies can reveal how staff input is utilised.

We will identify pharmacy staff who are involved in operating the REMEDY machine and invite up to 5 to complete a structured diary that records their activities and associated times. Staff will be invited to participate, using the participant information sheet shown in Appendix 7 (Version 1; date 22/7/2025). The consent form in Appendix 8 will be used Our time and motion study will be based on a 1-week sample period undertaken when the processes associated with the implementation of the REMEDY machine have reached steady state. The data collection form is available in Appendix 9 (Version 1; date 22/7/2025)

7.4.7. Discontinuation/Withdrawal of Participants from Study

During the course of the study a participant may choose to withdraw from the study at any time. This may happen for several reasons, including but not limited to:

- The occurrence of significant distress during study interviews
- Inability to comply with study procedures
- Participant choice (details do not have to be provided by the participant)

Participants may choose to stop their active involvement in just one component of the study, such as an interview, but choose for other components to still be used in analysis. Participants may also completely withdraw their consent, meaning that they wish to withdraw from the study completely.

Participants will have the following two options for withdrawal:

1. Participants can withdraw from the study but permit data obtained up until the point of withdrawal to be retained for use in the study analysis. Their data will be anonymised, and no further data would be collected after withdrawal.
2. Participants can withdraw completely from the study and withdraw the data collected up until the point of withdrawal if analysis has not yet taken place.

After data analysis it will not be possible to withdraw from the study.

In addition, the Investigator may discontinue a participant from the study at any time if the Investigator considers it necessary for any reason including, but not limited to:

- Ineligibility (either arising during the study or retrospectively having been overlooked at screening)
- Significant protocol deviation
- Significant non-compliance with study requirements (e.g., the participant decides that they do not want their interview recorded).

The reason for withdrawal by researcher (and by participant, if this information is volunteered) will be recorded in the study file.

7.4.8. Data management

7.4.8.1. Data Access

Direct access to data will only be by members of the research team as needed to fulfil their role. All members of the research team will maintain their training in good research practice.

Where required to ensure compliance with regulations, access will be granted to authorised representatives from the Sponsor or host institution for monitoring and/or audit of the study.

Anonymised data will be shared on request with academic and NHS organisations with a legitimate research interest.

7.4.8.2. Data Storage

All patient identifiable data will be stored securely on BCUHB servers. Pseudoanonymised data transferred to Bangor University will be stored in encrypted (password protected) folders on Bangor University OneDrive and in keeping with the Data Protection Legislation. Access to these data is limited to Bangor University staff working on the REMEDY project.

Quantitative data from the surveys, REMEDY machine logs. DATIX reports, clinical incidents, missed opportunities for use and data extracted from Adastra will be initially held in Excel on BCUHB servers then exported to Bangor University Excel once all patient identifiable information has been removed.

Qualitative data will be initially stored on the secure server for the institution it was collected by, e.g.where Oxford MSc students conduct focus groups or interviews, the data will initially be held on Oxford servers, anonymised and then uploaded to NVivo for analysis after all identifiable data has been removed. This data will then be shared with the sponsor, Bangor University and deleted from the Oxford server at the end of the programme of study. A pseudoanonymisation key will be held on the Bangor OneDrive. Data sharing agreements will be in place between Bangor, Oxford and Swansea universities (where the PPIE lead is based). No data will be shared with Aberdeen university, Prof Christine Bond will work as a contractor for Bangor University. Data sharing between BCUHB and Bangor University is covered by the provisions in the Organization Information Document.

7.4.8.3. Data Recording and Record Keeping

All data will be anonymised, and cases will be fictionalised if they are to be used in any

published material (our team have experience with this from previous work on patient safety[9]).

Pseudoanonymised data will be stored by Dr Adam Mackridge, Dr Rebecca Payne & Professor Dyfrig Hughes in Bangor University, with password protected storage on university servers where personal details will be stored securely, separately from the research data. ID numbers will be stored in separate password protected digital folders (not linked to the study data files). MSc and DPhil students from Oxford University may temporarily store data in password protected storage on university servers where personal details will be stored securely, separately from the research data until such a time as their programme of study concludes. This will be covered by data sharing agreements between Bangor and Oxford Universities.

De-identified data may be uploaded to Bangor University servers for analysis in specialist software such as NVivo, SPSS or R as described above.

Personal data such as contact details that could identify a participant, will be destroyed as soon as it is practical to do so and no later than 12 months after the end of the study.
Anonymised transcripts of interviews may be kept for up to 15 years, subject to consent, to write additional papers, reports, and support our input to service redesign. Once transcribing and checking has been completed, video and audio data will be destroyed.

7.4.9. Analysis and Interpretation

7.4.9.1. Qualitative data

The analytical approach will be thematic analysis as described by Braun and Clarke[23] within a constructivist paradigm. Data will be combined into an emerging narrative and refined as additional data sources are added as the study unfolds. Synthesis will be guided by the structure and methodology described in the NASSS framework paper[31] to surface and explain the challenges and multiple forms of complexity that influences progress towards implementing and embedding use of the REMEDY machine in routine practice.

Analysis will be led by Dr Payne – and Taron Topham and Racheal Adeosun for their discrete components – and will proceed iteratively alongside data collection, allowing for focusing of subsequent interviews. A subset of the qualitative data will also be analysed by Dr Mackridge to ensure validity.

Synthesis will be guided by the structure and methodology described in the NASSS framework paper[2] to surface and explain the challenges and multiple forms of complexity that influences progress towards implementing and embedding use of the REMEDY machine

in routine practice. Transcripts will be analysed using Braun and Clarke's 2022 thematic analysis methodology to identify themes.

The free text entries in the Datix and Adastra records will be manually searched and coded to describe who was and wasn't offered collection of their medication from the REMEDY machine and any identifiable reasons for this. Where it has been used, the case data will be linked to REMEDY machine data for that case (item issued, date and time issued, date and time collected, etc.) via a unique identifier which consists of the Adastra number and the date of issue. Insights gained from this data will be fed back to the weekly REMEDY Implementation meeting and will inform medicines stocking and workflow processes (e.g., if lots of children need a face-to-face consultation purely because there isn't a suitable preparation of steroids in the REMEDY machine, consideration can be given to adjusting the stock range).

7.4.9.2. Quantitative data

Data from the surveys will be cleaned by checking for outliers and out of range entries. Quantitative data will also be collated from routine operational data supplied by the implementation team.

Analyses of quantitative data will include descriptive statistics (e.g., frequencies, percentages, means and standard deviations/medians and interquartile ranges).

7.4.9.3. Health Economic Analysis

An economic analysis of REMEDY machines will be conducted using standard methods of decision analytic modelling, based on the most robust data available, and reported according to the CHEERS statement. Cost-effectiveness will be estimated from the perspective of the NHS and Personal Social Services in line with NICE guidance and based on an economic model that considers health outcomes, resource use, costs and health utilities to estimate the incremental cost per quality-adjusted life year (QALY) gained. The model structure will be developed in consultation with clinical experts to ensure it reflects a reasonable simplification of the context of care in the NHS. A Discrete Event Simulation may be necessary.

Primary data collection (specifically the time and motion study, patient-reported resource use and costs, Adastra records, REMEDY machine logs and Datix reports) will be supplemented with external data obtained from purposive searches of the literature using rapid review methodologies, and by using specialist databases (e.g., NHS EED for resource use parameters and the Tufts CEA registry for utility parameters) where necessary. The parameters needed to populate the model will include outcomes relating to the timely access of medicines, such as probabilities of harm / benefit from a defined selection of time-

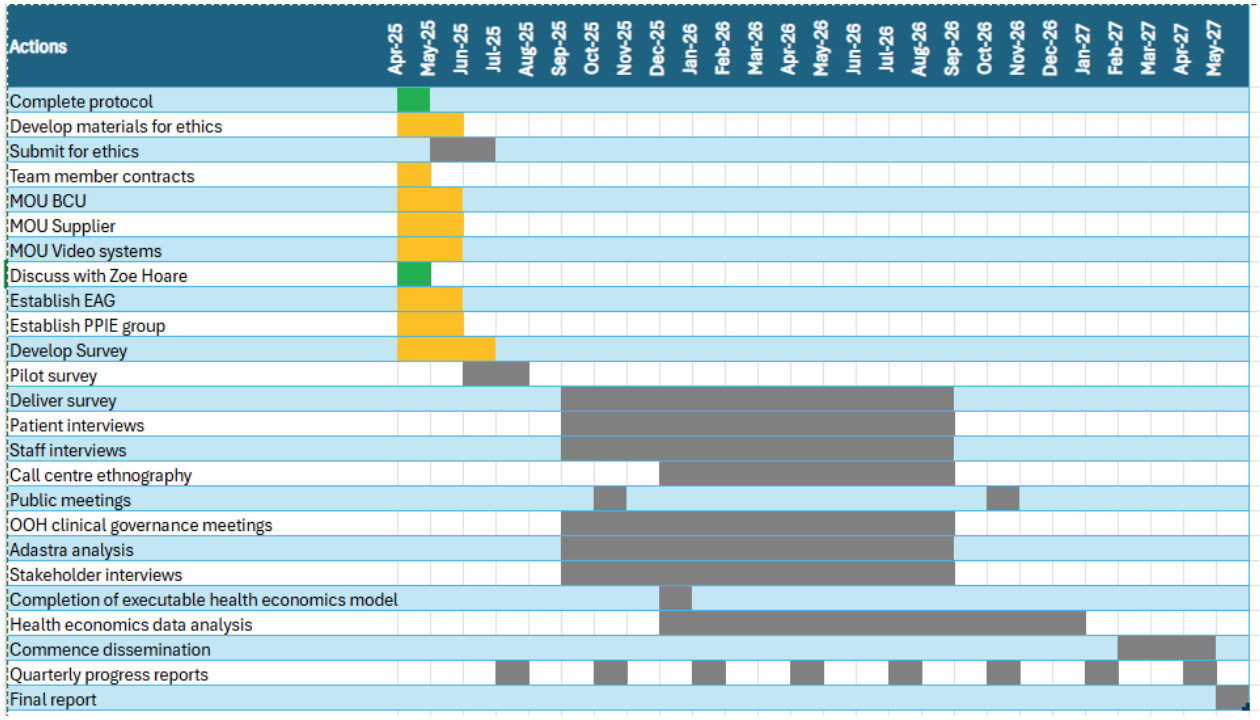
critical medicines estimated from RCT and observational evidence, health utilities, and resource use. Unit cost data will be derived from standard national sources (e.g., PSSRU Unit Costs of Health and Social Care, NHS reference costs and the British National Formulary).

The model will compare workflows including REMEDY machines with current practice and will consider patient proximity to pharmacies using geospatial data, community pharmacy opening times, and patient access to public and private transport. The decision analytic model will evaluate costs and outcomes over the lifetime of hypothetical patient cohorts: costs and benefits in future years will be discounted at an annual rate of 3.5% and varied between 0% and 6% in sensitivity analysis. Results from the model will be reported as incremental cost per QALY gained (ICERs) and compared with the NICE threshold range of £20,000 to £30,000 per QALY. Uncertainties in all parameter inputs will be accounted for in the analysis by including parametric distributions for each point estimate. This will enable probabilistic sensitivity analyses to be performed based on sampling from distributions using Monte Carlo simulation. Uncertainty in cost-effectiveness will be represented by cost-effectiveness acceptability curves (CEACs), which present the probability that REMEDY machines are cost-effective at a given threshold of cost effectiveness.

We will conduct a value of information analysis to inform future research priorities and the design of a definitive study of the clinical effectiveness of REMEDY machines. The expected value of perfect information (EVPI) and the expected value of perfect parameter information (EVPPI) will be calculated on both per-patient and population levels using the Sheffield Accelerated Value of Information (SAVI) approximation to facilitate computation effort. The EVPI for a decision problem must exceed the cost of research to make additional investigation worthwhile. It places an upper value on conducting further research overall (EVPI) or a specific area of information (EVPPI). If relatively small values are obtained for EVPI and EVPPI then this may suggest that no further research is necessary or required to obtain more precise estimates for specific parameters.

8. STUDY SEQUENCE AND DURATION

The study will commence on 1 April 2025 with data collection commencing 1 September 2025 subject to HRA and NHS R and D approval. The study will last until 31 March 2027. Timings are included in the Gant chart below:



8.1. Definition of End of Study

The end of the study is the point at which all study data has been collected by the research team.

9. QUALITY ASSURANCE PROCEDURES

The study may be monitored, or audited in accordance with the current approved protocol, relevant regulations and standard operating procedures.

10. ETHICAL AND REGULATORY CONSIDERATIONS

10.1. Declaration of Helsinki

The Investigator will ensure that this study is conducted in accordance with the principles of the Declaration of Helsinki.

10.2. Approvals

Following Sponsor approval, the protocol, informed consent form, participant information sheet and any proposed advertising material will be submitted to an appropriate Research Ethics Committee (REC), and host institution(s) for written approval. The project has already

been registered with the BCUHB Research and Development team and has received approval.
The Investigator will submit and, where necessary obtain, approval from the above parties for all substantial amendments to the original approved documents. And will inform the REC about any proposed minor amendments.

10.3. Other Ethical Considerations

The answers participants provide during the interview or the routine process data may lead to disclosure of information that raises concern about a person's wellbeing or care. If this happens, the researcher will raise this with one of the Principal Investigators who will use professional judgement on a case-by-case basis but would normally contact the participant for further discussion or inform the Medical Advisor for the BCUHB West GPOOH team, Dr Jana Schmidt.

10.4. Reporting

The Chief Investigators will submit reports throughout the study, or on request including an Annual Progress report to the REC Committee, HRA (where required) host organisation and Sponsor. Quarterly reports will be submitted to the funder (Health and Care Research Wales). In addition, an End of Study notification and final report will be submitted to the same parties.

10.5. Participant Confidentiality

The research team will safeguard the privacy of participants' personal data. This dataset, especially the Adastra record and the REMEDY machine data on the medications issued, raises confidentiality issues. The processing of the personal data of participants will be minimised by making use of a unique participant ID number on all study documents and any electronic database, with the exception of the consent form and CRF, where participant initials may be added. All documents and electronic files will be stored securely and only accessible by study staff and authorised personnel. The study will comply with the UK General Data Protection Regulations (UK GDPR) and Data Protection Act 2018, which requires data to be anonymised as soon as it is practical to do so.

10.6. Expenses and Benefits

Interviewees who are members of the public (rather than health care professionals or external stakeholders) will receive their choice of a £25 voucher for participating in the research, and there are no additional expenses anticipated as there is no travel for participants.

11. FINANCE AND INSURANCE

11.1. Funding

The study is funded by Health and Care Research Wales

11.2. Insurance

The University has a specialist insurance policy in place which would operate in the event of any participant suffering harm because of their involvement in the research. NHS indemnity operates in respect of the clinical treatment that is provided.

11.3. Contractual arrangements

Appropriate contractual arrangements will be put in place with all third parties.

12. PUBLICATION POLICY

Academic papers will be published in peer reviewed journals, according to relevant reporting guidelines and checklists, and where the relevant copyright policies will be followed. Dissemination is likely to also include conference abstracts, briefing papers and newsletters.

Taron Topham and Racheal Adeosun are both MSc students and will be using the data they collect for their MSc theses.

Rebecca Payne is undertaking a second doctorate and will be using the data she collects for her DPhil thesis.
Medical, Masters, and PhD students additional to those specified in this protocol may be embedded within the project as research assistants and use the data for completion of projects such as a thesis. Where this is the case, it will be clearly communicated to participants prior to consent being taken or any data collection taking place.

The Investigators will be involved in reviewing drafts of the manuscripts, abstracts, press releases and any other publications arising from the study. Authors will acknowledge that the study was funded by Health and Care Research Wales. Authorship will be determined in accordance with the ICMJE guidelines and other contributors will be acknowledged.

13. DEVELOPMENT OF A NEW PRODUCT/ PROCESS OR THE GENERATION OF INTELLECTUAL PROPERTY

13.1. REMEDY machine

Software has been developed to change the existing Pharmaself24 machine into the Pharmaself REMEDY machine. The IP relating to this will continue to belong to the manufacturer, Videosystems.

13.2. Toolkit

A Toolkit will be produced as part of this project to facilitate dissemination and to support other services to embed similar technologies. It will be aimed at other Welsh Out-of-Hours services and provide a summary of the implications for industry and policy makers/lay summary. It will be publicly available and widely shared to inform dissemination and learning under a Creative Commons Licence.

14. ARCHIVING

At the end of the study, electronic files containing the anonymised data will be transferred to a dedicated network storage space and will be stored securely in the North Wales Medical School, Bangor University for up to 15 years. This will be in line with local SOPs. Access to this will be limited to members of the research team.

After the archiving period has ended, the paper documents and electronic files will be confidentially and securely destroyed in line with the Data Retention and Deletion Policy at NDPCHS.

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16. APPENDIX A: AMENDMENT HISTORY

Amendment No.	Protocol Version No.	Date issued	Author(s) of changes	Details of Changes made

Protocol amendments will be submitted to the Sponsor for approval prior to submission to the REC committee, and HRA (where required).