APFT Wound care management system dossier

Any Place Foundation Trust (APFT) is a healthcare organisation that provides community care. One of their services is focused on managing complex wounds. APFT would like to buy and implement a new health information system to better support patient and wound care management within that service. In this dossier, you will find information that is relevant for the procurement, testing and implementation of the new system. The dossier is a living document, which means new things will be added over the course of the module, including worked examples for the exercises we ask you to complete.

1. Clinical context

The size of the problem

Complex wounds are defined as wounds with superficial, partial or full-thickness skin loss healing by secondary intention (i.e. healing of an open wound, from the base upwards, by laying down new tissue). In the UK, community point prevalence of complex wounds is estimated at approximately 16 per 10,000 people. There are nearly 260,000 people in APFT's coverage area, with approximately 680 of them being treated by the APFT community wound care service at any given time.

Patient population

The most common types of complex wound are venous leg ulcers (VLU), diabetic foot ulcers (DFU), traumatic wounds and pressure ulcers (PU). Complex wounds are often a result of underlying disease. Patients tend to be elderly with at least one comorbidity, most commonly cardiovascular disease, diabetes and arthritis. Complex wounds have a negative impact on health-related quality of life.

Available treatment options

Treatment options available for complex wound care include a wide range of interventions: dressings, compression for venous leg ulcers, surgery for venous leg ulcers, pressure relief and redistribution mattresses and cushions for treating and preventing pressure ulcers, and removal of damaged or devitalized tissue. Treatment is guided by local procedures which take into account national guidelines for specific wound types, for example:

- Diabetic foot ulcers: https://www.nice.org.uk/guidance/ng19/chapter/Recommendations
- Pressure ulcers: https://www.nice.org.uk/guidance/cg179
- Venous leg ulcers: https://www.sign.ac.uk/sign-120-management-of-chronic-venous-leg-ulcers

2. Who is involved in delivering the service?

A person with a complex wound typically tries to self-manage for a while, before visiting the GP

A person with a complex wound typically tries to self-manage for a while, before visiting the GP for management. Often, the GP then refers the patient to APFT's community wound care service. People can also be referred from secondary care, e.g. if they require care for a pressure ulcer or surgical wound following a hospital admission.

Complex wounds are largely treated in the community by nurses (mostly NHS Band 5 and 6), either in community clinic settings or in people's own homes. Community nurses form the main group of clinical staff who perform hands-on wound care, and a high proportion of their case load involves caring for people with complex wounds. A typical borough in APFT's coverage area is served by a team of 15-20 community nurses on average. The community matrons manage a number of community nursing teams, each of which are managed locally by a clinical lead (patch leads). Matrons oversee the community nurses on a management level, and undertake quality audits and service improvement projects.

If needed, community nurses refer patients to a tissue viability nurse (TVN); see Chapter 4 for a referral example. TVNs are part of a senior nursing team and have a multi-faceted role. As well as providing wound care, advice and guidance, they deliver education and develop practice.

In addition, community nurses may also refer patients to GPs (e.g. for prescription of medications), as well as to other specialised services, such as podiatry, vascular services, continence teams, physiotherapy, dermatology, dietetics and nutrition.

Lastly, informal carers are also often involved in providing care for people with complex wounds, e.g. family members.

Here is a highly simplified overview of who is involved at what point in the pathway:

2.1. User stories (examples)

As part of topic 2, we asked you to think about stakeholders of APFT's new health information system, and for each of them, formulate a user story to reflect a specific need they might have related to the system (exercise 1). Below we have provided some examples. Are they similar to what you came up with?

- As a **community nurse**, I want to have access to the system via a mobile app that is quick to use, so that I can focus on the patient during home visits.

- As a **GP**, I want to have a system that integrates the wound information collected by community nurses into my electronic patient record system, so that I have a complete picture of how my patients are doing.
- As a **tissue viability nurse**, I want a system that helps community nurses to collect complete data on the status of the wound and past and current treatment plans, so that I can decide whether or not to accept the referral.
- As a **matron**, I want to have a system that provides me with an overview of the number of home visits at the individual nurse and nursing team level, so I that I can monitor case loads.
- As an **informal carer**, I want a system that where I can access clear instructions on what to do in case there is a problem with the wound, so that I can assist in making sure my loved one gets the care they need.

3. What information is recorded and where?

APFT community nurses use a mixture of paper and electronic systems to record clinical information about the care they provide to people with complex wounds. However, much of the information collected is as free text which makes it difficult to use both clinically (e.g. it is often difficult to review previous consultations) and for reporting purposes (e.g. clinical audit, CQUIN targets).

Paper forms

Paper forms are often used to collect information about the wound itself. One example is a wound assessment chart which records type of wound and its location, depth, stage (if applicable), size, exudate, odour, wound edges, surrounding skin, infection signs, and treatment plan. Nurses have to conduct a wound assessment every week. Another example within the paper-based system is the leg ulcer pathway documentation. These documents are often left in the patient's home. They contain information regarding quality of life, wound information, the treatment plan, etc., and are completed by nurses weekly, with some sections being filled in by patients. Chapter 3.1 has some examples of paper forms that the community nurses currently use.

Electronic system

APFT currently uses an electronic system that is an adapted version of a primary care record system. It includes basic information for all their patients, such as name, gender, height, date of birth, contact details, name of GP, and known comorbidities. The electronic system has a simple wound assessment template built in, but at the moment much of the actual data collection still occurs on paper. There are some examples of screenshots in chapter 3.2.

In some, but not all boroughs, community nurses can access the electronic system at the point of care using tablet computers. They use the tablets to record every home visit by writing a

rudimentary summary of the treatment given, in addition to completing the weekly paper-based wound assessment charts. They copy the information from these paper charts into the electronic system at the end of their shifts, using desktop computers available at their base clinic location.

4. Referral example: venous leg ulcer referral to a tissue viability nurse

Referrals are often made by fax, email, phone or letter/form from community nursing to the tissue viability nurse (TVN). Referrals do not routinely include an image of the wound with other clinical information, although it is widely acknowledged that an image would be extremely valuable, as “a photo says more than a thousand words”.

Before accepting a referral, the TVN needs to know about the severity of the wound; this may include information on, for example, the duration of the wound; the size; and signs and symptoms of infection. Preferably, the TVN also wants to know whether an ankle-brachial pressure index (ABPI) assessment has been undertaken using a Doppler machine.

This assessment gives some guidance as to whether compression therapy (the gold standard treatment for venous leg ulceration) is appropriate; if the ABPI reading is outside of a given range (i.e. less than 0.8), this may indicate that the ulcer is of arterial aetiology, thereby meaning that compression could cause further damage. Not all community nurses are able to do an ABPI as they may not have been trained; also there is often a lack of Doppler machines which means that many wounds may deteriorate further whilst they are waiting for the test and therefore without compression.

If appropriate for compression, the patient should be offered compression therapy that is supported by evidence. Currently four-layer bandaging or two-layer hosiery are the main types of compression supported by trial evidence. Compression therapy can, however, be uncomfortable (and often painful) for patients. It can also negatively affect their quality of life due to restrictions on their ability to wear their normal clothing/footwear. Not all community nurses are trained to apply four-layer bandaging, so even after the ABPI, a properly trained nurse needs to attend to do the bandages.

The TVN is likely to want to know what types of compression have been offered, whether the patient can tolerate it, whether they have adhered to the treatment and how long it has been attempted for. Additionally, the TVN needs to know which types of dressing have been used on the wound up until now. Ideally, all of this information should be available for the TVN before making a decision (e.g. on which treatment to offer, or on whether the patient should be admitted to hospital), and many patients end up receiving sub-optimal care in the meantime.

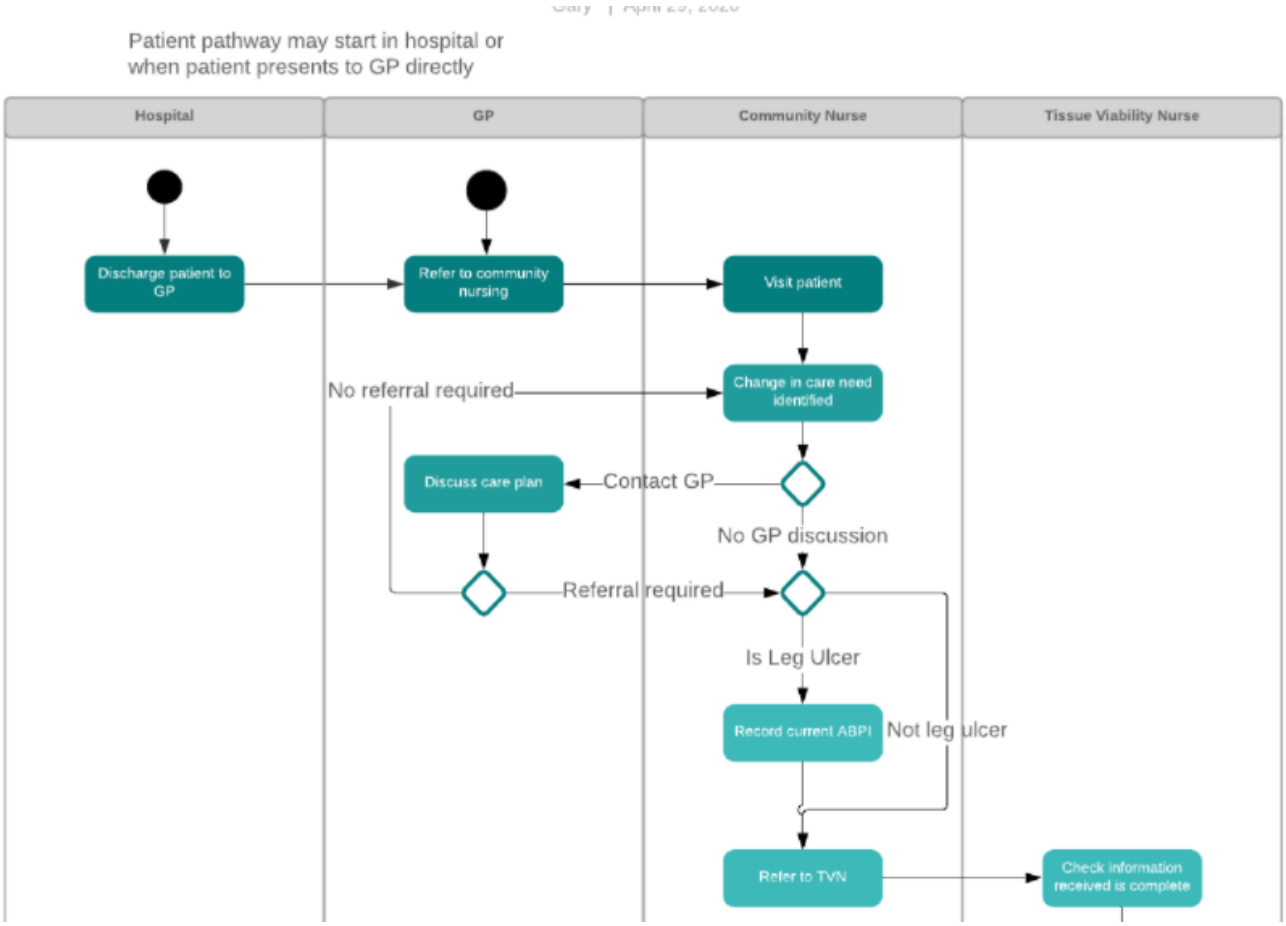
4.2. Final patient pathway diagram (example)

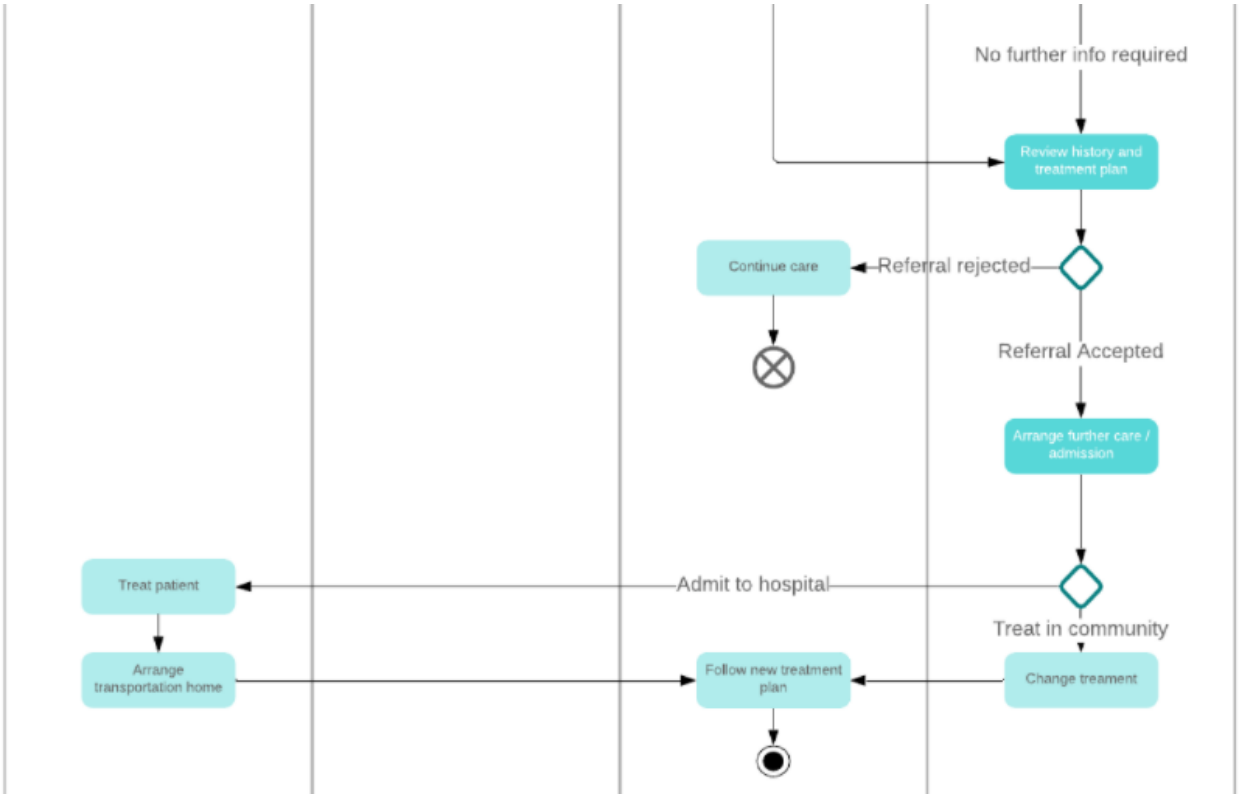
In topic 2, we presented you with a first version of a patient pathway diagram based on the initial description of the referral example, which you can find at the beginning of this chapter. However,

as feedback on that first version, the clinical team provided us with the following additional information:

- Tissue viability nurses are located both within the community and in secondary care. So referral could be within the community or from community to secondary care.
- Patients with wounds start off in the hospital OR present to their GP initially.
- ABPI measurement is usually only needed for leg ulcer assessment.
- The care plan is always discussed with the GP.

Below we have included our updated version based on this feedback. Compare it to your suggestions for amending the diagram for exercise 2. Are there any differences?





5. Rationale for system procurement by APFT

Nurses have to duplicate wound data entry from paper into the electronic system. The point of care access to the electronic system (using tablets) has been implemented within the last five years, but with little input from end users, and with little training and support for nurses to use it. The data entry into the electronic system relies heavily on free-text information and does not include features such as image capture or the ability to seamlessly refer patients to other specialties. Therefore, referrals via fax, email or phone often leads to insufficient information for those receiving the referral to make a decision about whether to accept or reject it. Community nurses are moreover worried that spending time documenting on a tablet takes away face-to-face time from the patient, and that it compromises the trust and confidentiality they need to care for their patients.

The current situation (as described in chapters 1-5) has been causing concerns among the entire care team, particularly matrons and GPs, that this highly unstructured way of gathering, storing and sharing information impedes getting the right information to the right person at the right time, resulting in important information being lost or not passed on. There are also concerns that the current system does not facilitate the continuity of care that wound care management requires. Combined with the massive shortage of staff, lack of time when working in a patient's home, and under-funding in community nursing, it means that many patients may receive sub-optimal care. In addition, there is a wish to embed photographic evidence of the wound alongside clinical information with the hope of a more rapid diagnosis and better care planning.

In summary

The APFT leadership see numerous advantages of procuring and implementing a more streamlined set of electronic documentation. Making the correct and up-to-date patient information electronically available to the right person in a timely manner, enables more informed care and treatment decisions. It supports the health care professionals to work more efficiently as an interconnected team, overcoming fragmentation and duplication of service delivery. It assists the team to electronically communicate and exchange information; facilitates more coordinated health care across the continuum of care; enhances access to clinical evidence and clinical decision support tools; and, finally and most importantly, it has the potential to improve the quality, safety and efficiency of current clinical practices.

6. System design

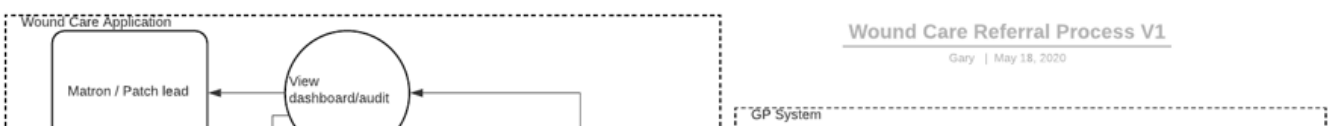
Based on the description of the clinical context, the current APFT information systems and stakeholder requirements, the APFT senior leadership have identified a new wound care management system that seems to address most their needs.

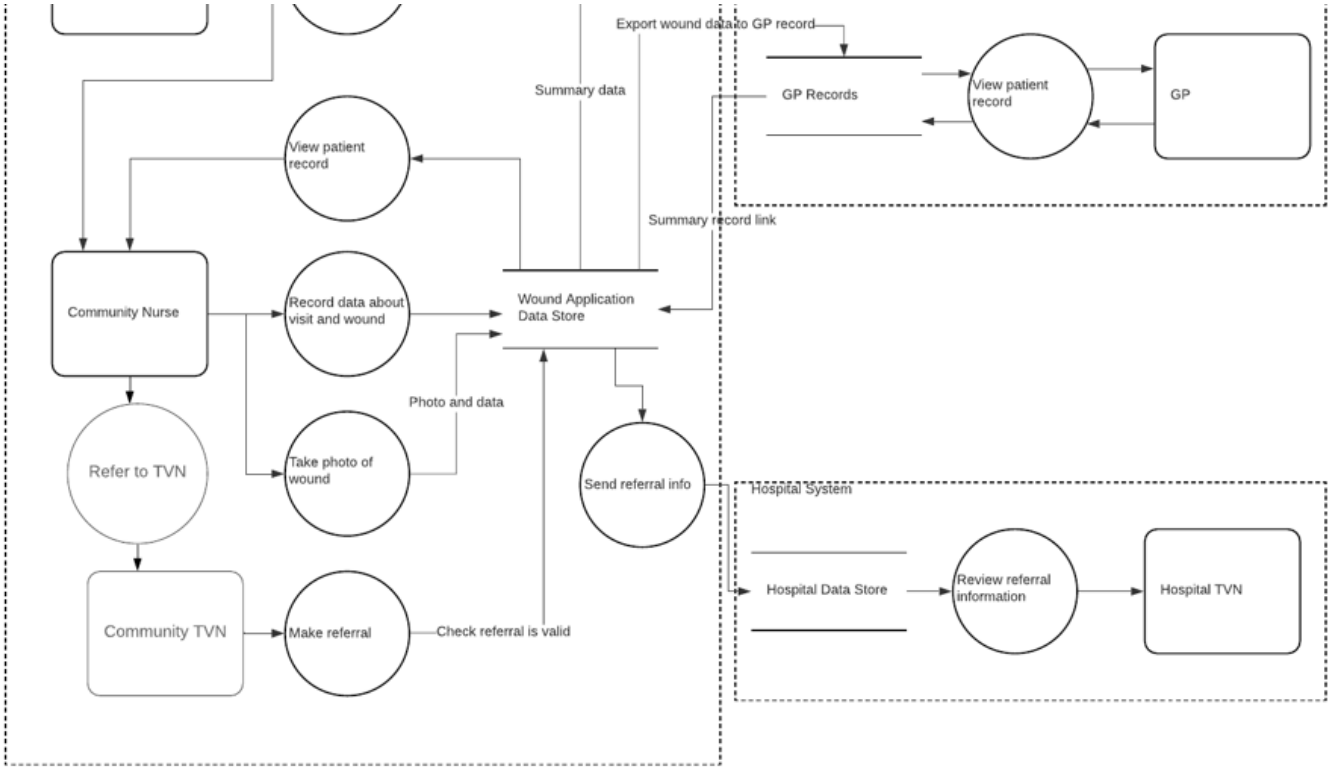
In this chapter, you will find a range of diagrams that formally present the design of that new system, including:

- Data flow diagram
- Use case diagram
- Class diagram, specifically related to uploading a picture of a wound as part of a referral to the tissue viability nurse

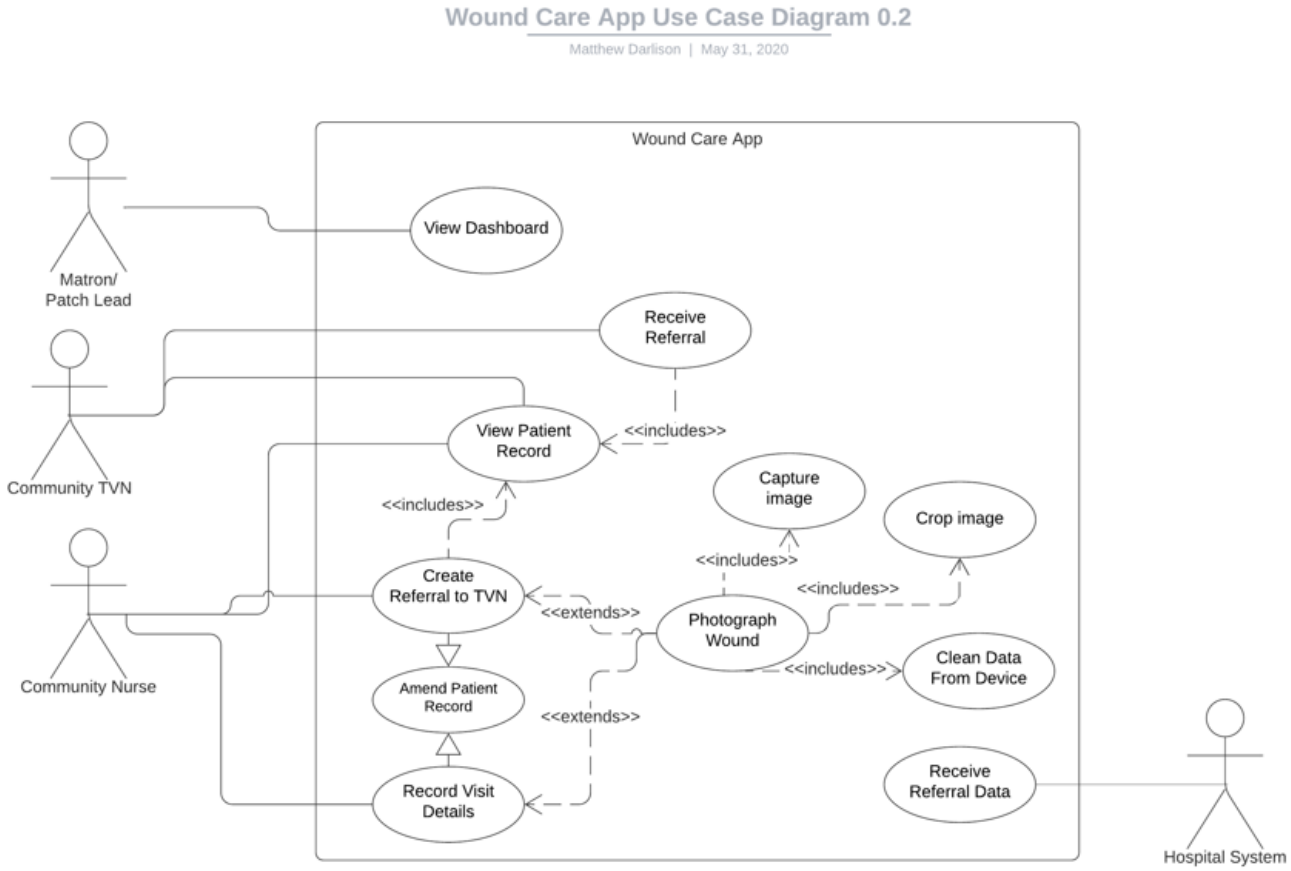
Seeing the diagrams alongside each other should contribute to your understanding of how you can formally visualise the different aspects of a system's design.

Data flow diagram

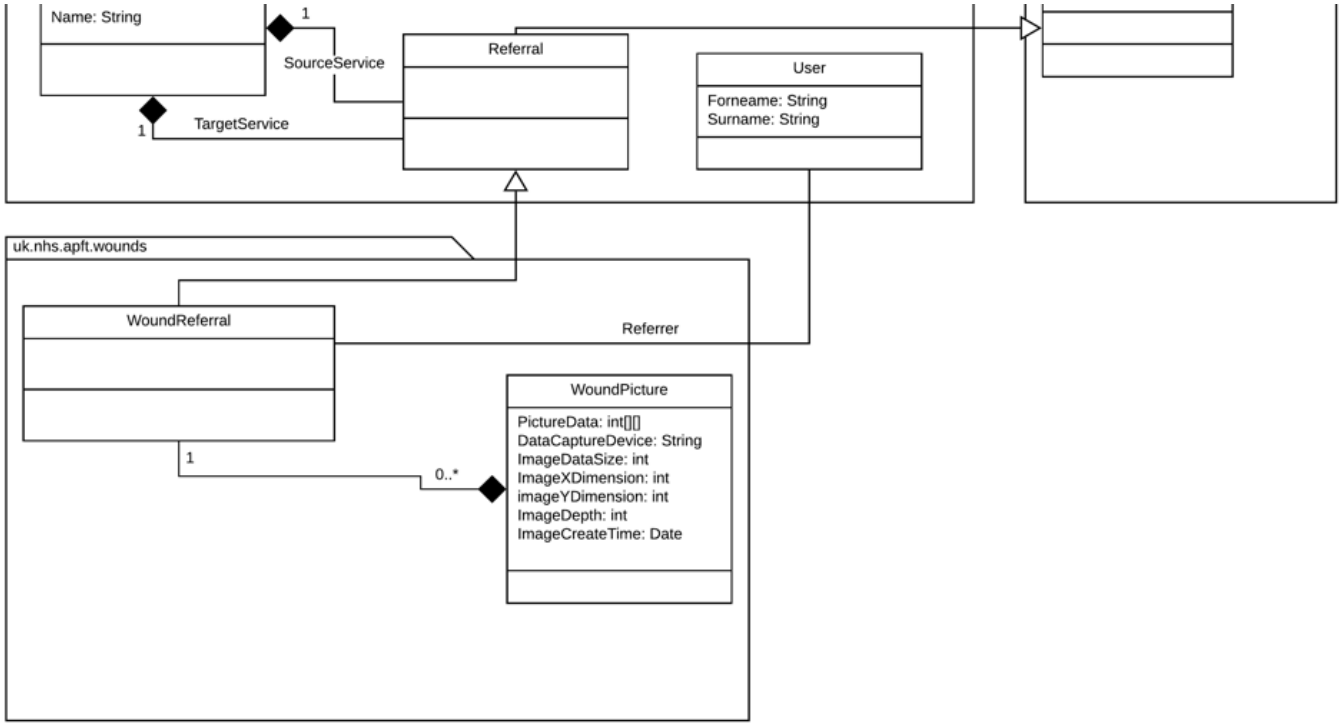




Use case diagram



Class diagram (uploading wound picture as part of TVN referral)



Acceptance test for 'upload wound image as part of TVN referral'

One of the key requirements of the new wound care management system is that it should enable community nurses to upload a picture of a wound onto the patient's record. The new system offers this functionality.

Since nurses have indicated that they see this feature as one of the main benefits of the new system, the test team within APFT's IT department have developed an acceptance test plan to ensure the feature is fit for purpose. Do the test cases align with the ones you came up with as part of the exercise in topic 5?

Test scenario: Community nurse can upload wound image as part of referral to TVN

Test cases	Pre-conditions	Post-conditions	Expected results
Open the 'upload image'	(1) user is logged into the system	None	'Upload image' feature is open

feature	(2) user has selected and opened a patient's record (3) user has started a TVN referral		and shown as a pop-up window
Close the 'upload image' feature	(1) 'upload image' feature is open	None	Pop-up window is closed and 'upload image' feature no longer active
Upload an existing image to the referral	(1) 'upload image' feature is open (2) ≥1 wound image file available in patient's record	Uploaded file saved as part of referral	Uploaded wound image included in referral to TVN
Upload a new image to the referral	(1) 'upload image' feature is open (2) ≥1 wound image file available on user's device	Uploaded file saved as part of referral	Uploaded wound image included in referral to TVN
Upload a non-image file to the referral	(1) 'upload image' feature is open (2) ≥1 non-image file available on user's device	Uploaded file not saved as part of referral	Display of error message to indicate incorrect file type; 'Upload image' feature remains open
Remove an uploaded image from the referral	(1) user has selected a TVN referral that has not yet been submitted (2) ≥1 wound image available as part of	Uploaded wound image removed as part of referral	Uploaded wound image removed as part of referral

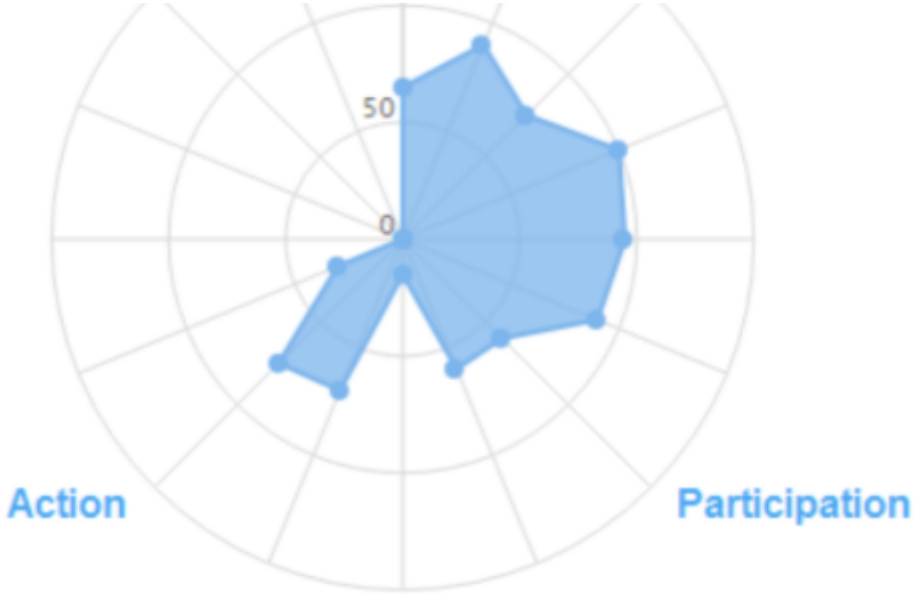
Back to summary

7. Implementation Planning

To think through the key aspects of implementing the new wound care management system, the project team have completed the **online NPT toolkit**. This chapter presents the resulting **spider diagram** and examples of how that informed APFT's implementation plans.

7.1 NPT report and interpretation

Resulting spider diagram from completing the online NPT toolkit



Interpretation and link to implementation plan

1. Sense-making: Do people understand what the system entails and how it may benefit them?

- The disadvantages of the current system (e.g. duplicate data entry, incomplete referral information, reliance of free text information, lack of integration with primary care) are widely acknowledged across all stakeholder groups. Therefore, there are few concerns about whether users will see the purpose and potential value of the system.
- Since part of the current record keeping is already electronic, some users may not appreciate how the new system would be different from the one that they are currently using. This may lead to confusion about whether the new system is replacing or complementing the system(s) already in use.
- Furthermore, community nurses have expressed concerns about how reporting requirements may take away time they spent with patients during home visits. These concerns may affect nurses' views on the tasks and responsibilities the system could create for them, either negatively ('the system will only ever create more work for me') or positively ('the system will save me time as soon as I start using it'). Unrealistic views are a risk for user engagement, and therefore for successful implementation.
- To address the main concerns related to sense-making, the implementation plan will include a series of tasks related to 'Communication strategy development' to preempt confusion and unrealistic expectations among staff.

2. Participation – Do people buy into the system and do they agree it should be part of their work?

- There is organisation-wide support in APFT to drive the system implementation and make it a success. To make this explicit, there will be a Project Board, consisting of representatives of the main stakeholder groups. In addition, each community nursing team will be asked to put forward one nurse who will act as main liaison between the team and the Project Board. The Board and the team liaisons will play an important part in executing

the communication strategy as part of the implementation plan.

- The involvement of nurses in the implementation of the current system was limited, and many of them see this is one of the main reasons it has never fitted their workflows or met their needs. This has increased their willingness to contribute to the implementation of the new system, both in the short and in the long term. At the same time, however, most nurses work in teams that continue to be understaffed, and they therefore feel they do not have the capacity to contribute to the implementation work. This requires a phased implementation approach (see under 'Action).

3. Action – Are people able to use the system and are they supported to do so by the organisation?

- The majority of nursing teams are currently understaffed, posing a major risk to implementation due to users not being able to enact the system in a way that works for them. Therefore, the implementation will be phased, starting with the teams that currently do not experience staffing issues. However, this does not necessarily address the longer-term risk of incomplete roll-out of the system across the whole of APFT due to continued lack of funding for community nursing in general.
- When implementing the current system, training and support for staff were limited, which caused all sorts of problems with people using the system incorrectly or not at all. This has had a substantial negative impact on the trust that staff now have in the system and in how their colleagues are using it. To avoid making this mistake again, the implementation plan for the new system will dedicate sufficient time and resources to staff training. This will ensure that everybody has the knowledge and skills to use the system as intended. **The training will be delivered by the system supplier, who will also provide help desk support as part of the contract**.

4. Monitoring – Once they start using it, do people agree on the value of the system and change their ways of working?

- This construct will be evaluated during the first phase of the implementation; the 'monitoring' area in the diagram is therefore still empty.
- In order to ensure that people can assess the effects and the value of the system, the implementation plan includes a series of tasks related to 'Monitoring system performance'. This includes tasks such as: creating a system performance dashboard accessible to all staff members in real-time; publishing quarterly Project Board reports on system performance, including an action plan to further improve it; and conducting a user satisfaction survey.
- Examples of **indicators for monitoring system performance** will be added to the dossier as part of the week 8 materials.

7.2 Monitoring of System Performance

The table below provides examples of **key performance indicators** (**KPIs**) that the **Project Board**

The table below provides examples of **key performance indicators** (KPIs) that the **Project Board** –who are overseeing the system procurement and implementation–will use to monitor the system's performance. The results for these and other KPIs will be displayed on the **system performance dashboard** that will be accessible to all staff members in real-time. Guided by the KPIs, the Project Board will also **publish quarterly action plans** for improving system performance.

Domain	Verbal expression	Owner	Data source	Measurement frequency
Technology	Decrease the percentage of home visits where nurses cannot access the system due to technical issues with the tablets to ≤10% in the first 6 months of deployment to increase system accessibility	Trust IT Services	IT Services logs	Weekly
Process	Decrease the waiting time when calling the help desk to an average of ≤2 minutes and a maximum of ≤5 minutes in the first 6 months of deployment to increase user engagement with the system	System supplier	Help desk phone logs	Weekly
Service	Decrease the average time between submitting and accepting/rejecting a TVN referral to two days by the in the first 12 months of deployment to increase the efficiency of the service	TVNs and community nurses	System logs	Monthly