

Patient Flow in Acute Medical Units. A design approach to flow improvement

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INTRODUCTION

'Patient Flow' is a research and design project carried out by the Helen Hamlyn Centre for Design (HHCD) in partnership with the Royal College of Physicians of Edinburgh (RCPE) to exploit what design can offer in improving patient flow in Acute Medical Units (AMUs). The project focuses on improving system efficiency while improving the user experience, and is being co-developed with members of staff and patients around the UK.

METHODOLOGY

The HHCD works with frontline users employing Inclusive Design principles through a Double Diamond process.¹ The Double Diamond is a four-stage design methodology that employs two phases of divergent and convergent thinking modes. The four stages are: 'Discover, Define, Develop and Deliver'.

During the 'Discover' phase, ethnographic research approaches are employed to identify the functional challenges and barriers encountered in the area in question. The 'Define' phase distils and rationalises the insights and learnings from the research to define an evidence-based design brief, from which a design intervention can be developed. Working closely with service providers, stakeholders and service/product users who will eventually benefit from the design intervention, the 'Develop' and 'Deliver' phases generate and develop concepts through iterations of testing and refinement. This participatory approach enables the co-design of solutions for real user needs.²

Nine hospitals (Chelsea and Westminster Hospital, Royal Infirmary of Edinburgh, Western General Hospital (Edinburgh), Victoria Hospital (Kirkcaldy), Forth Valley Hospital, Borders General Hospital, Hammersmith Hospital, University Hospital of North Durham, Queen Elizabeth University Hospital, (Glasgow)) were visited in England and Scotland to observe the workings of the

AMU, communication methods and care tasks undertaken by hospital staff teams within each hospital and the effects of geographic layout on patient flow. Four hospitals (Chelsea and Westminster Hospital, London; Royal Infirmary of Edinburgh; Western General Hospital, Edinburgh; and Victoria Hospital, Kirkcaldy) were selected for a total of 210 hours of in-depth observations, where ethnographic research methods were used (typically shadowing key members of staff and undertaking long-duration ward observations). These have provided a rich and comprehensive understanding of everyday AMU tasks, the pressures and demands on the system, and the experiences of patients and staff.

To ensure continuity of observations throughout the entire patient experience, the majority spanned consecutive days. The study focused on day shifts as the function of the hospital is assumed to be at its maximum capacity at that time. The study included one weekend observation for clearer understanding of any differences in performance.

Interviews were undertaken with patients recruited through voluntary patient groups across the UK. These mainly covered the discharge experience from hospital unit to community care, and how communication and support was achieved through the process. We performed interviews with GPs local to the catchment areas of the hospitals. These interviews covered the process of discharge from the perspective of primary care, concerning aspects of follow-up arrangements, re-admission experiences and availability of other community support services.

The RCPE and hospital teams contributed continuously to the co-design process to propose new ideas as well as evaluating our design propositions. These validation sessions indicated to the research team the appetite and readiness for innovative interventions in the selected areas of opportunity.

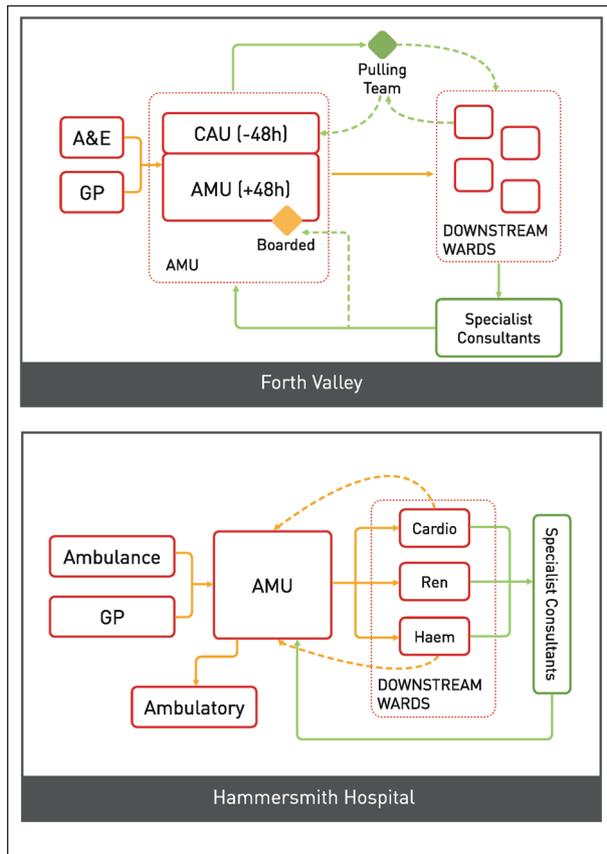


FIGURE 1 Acute Medical Unit System Map at the Forth Valley Hospital, Larbert, and Hammersmith Hospital, London

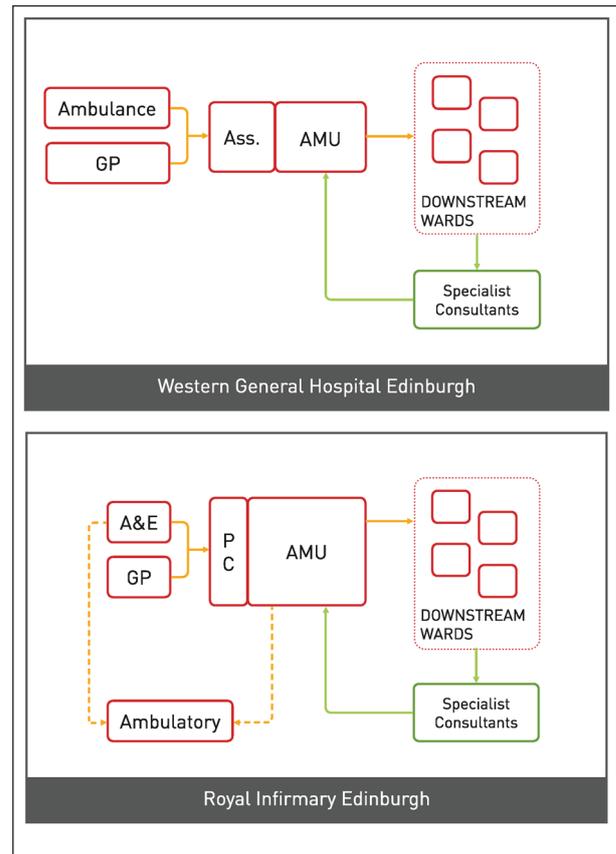


FIGURE 2 Acute Medical Unit System Map at the Western General Hospital Edinburgh and Royal Infirmary of Edinburgh

DIFFERENCES BETWEEN AMUS

AMUs deploy highly resourced multidisciplinary teams, providing all the specialisations required to investigate patient conditions and make prompt decisions regarding the treatment pathway and care plan. AMUs face capacity and demand pressures that impact on the quality, dignity and safety of patient care, as well as patient flow and the quality of both patient and staff experience.³ Wide variations were observed in the respective resources and functioning of different AMUs, affecting the results obtained by each hospital.

An AMU's functioning may evolve to suit its hospital and local demands (Figures 1 and 2). For example, Hammersmith Hospital's AMU forms an interface between the various specialist wards, liaising between them or providing a 'patient retrieval team' for overloaded wards. In the Forth Valley Royal Hospital, the AMU has evolved the technique of differentiating short stays from longer stays. This allows it to provide faster specialist input to the longer stay patients when there is no capacity at the destination wards, while retaining capacity to admit fast turnaround patients.

The performance of the wards was observed to reflect the co-working styles of the individual AMU staff and

their counterparts in the specialist wards. This relationship-based style of interaction promotes good communication of assessment outcomes, and successful patient transfers. Furthermore, functional differences were observed within the same ward, depending on which consultant was in charge. For example, some teams complete two daily ward rounds, whereas others make a single ward round and review patients individually as required. Finally, patient flow in AMUs that are staffed 7 days per week tends to suffer if the capacity of hospital support services reduces at weekends.

THE CHALLENGES OF AMU DISCHARGE

Discharge from acute settings was selected as the key focus for the project, based on its positive impact on patient and staff experience, as well as clinical need. Successful discharges directly from an AMU to the community can also reduce the required numbers of downstream hospital beds, resulting in a considerable positive impact on overall hospital patient flow.

Communication throughout the patient's care journey was identified as the biggest single challenge in discharges. The investigation process in the AMU is typically iterative, so patient flow is typically non-linear. The absence of any universal means of communicating a

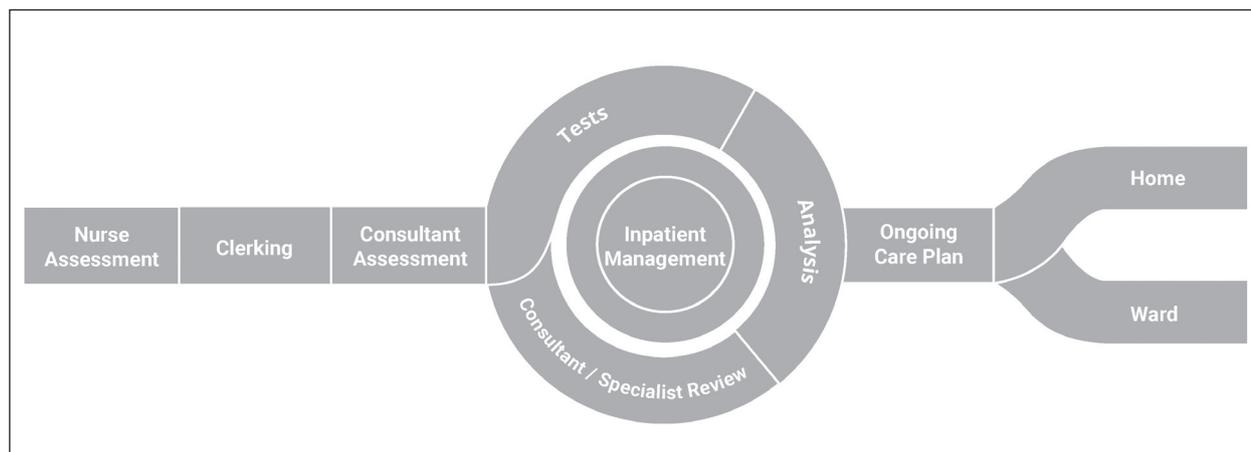


FIGURE 3 Visual Patient Care Journey ©2016 RCPE

patient's progress along the care journey complicates understanding the patient pathway, so that Discharge is perceived as just a task at the end of the process, rather than culturally embedding it as an objective throughout the process. If Discharge is only seen as the final task of the pathway, its priority is perceived as lower than the treatment of sicker patients and the discharge of patients who are ready to go home may be unnecessarily delayed.

This study has highlighted that while team members may try to focus on discharge throughout the patient stay, there is no overarching process that ensures efficient coordination to complete all the tasks necessary before a patient can be safely discharged, so the system currently defeats them. Examples of this are the difficulty of organising transport to home beyond a certain time of day, or tests that could have been carried out before the ward round to confirm to the consultant that the patient is ready to be discharged.

The Discharge process requires completion of tasks by many members of a multidisciplinary team (e.g. medicines reconciliation by the pharmacist). This represents a coordination challenge, exacerbated by the absence of any officially appointed coordinator. Instead, this responsibility often falls to the staff nurse or the junior doctor, often working in an understaffed environment (as defined by staffing ratio recommendations),⁴ and inadequately briefed as to the most important organisational priorities. Furthermore, the AMU system is extremely 'individual-dependent', which, given that decisions may not be recorded in a shareable way, can lead to mistakes and failures to communicate relevant information, affecting the consistency of care and information given.

We conclude that poor communication tools constitute the biggest challenge at AMUs, across all the processes observed. Patients describe feeling rushed out of their beds, insufficiently reassured, fearing that their treatment

has not been completed, or medicines and information are missing. They also state that ward staff did not communicate efficiently, leaving them unprepared for discharge arrangements (e.g. transport).

DESIGN OPPORTUNITIES

The design team formulated a set of design questions to challenge the current system of AMU discharges, to inform a new design brief to drive the next development of the project:

How can we design a strategy so that patients are discharged from Acute Medical Units at the right time, by the right people – improving patient flow, quality of care and the human experience, from the moment of admission?

The results and insights gathered from hospital observations, co-creation and feedback sessions provided a framework for idea generation focusing on four opportunity threads, summarised as follows:

1. Visibility of the complete process across the multidisciplinary team
2. Ability to share information among the multidisciplinary team and beyond, promoting ownership and accountability across the team
3. Patient empowerment through information
4. Ability to follow-up patients post-discharge

DESIGN OUTPUTS

Using these four principles, the design team embarked on an ideas generation phase, concept selection and validation through iterative testing. These are the proposed design outputs.

Visual Care Journey

The Visual Care Journey is a diagram that visualises the stages of care, allowing members of the care team to communicate more effectively where the patient is

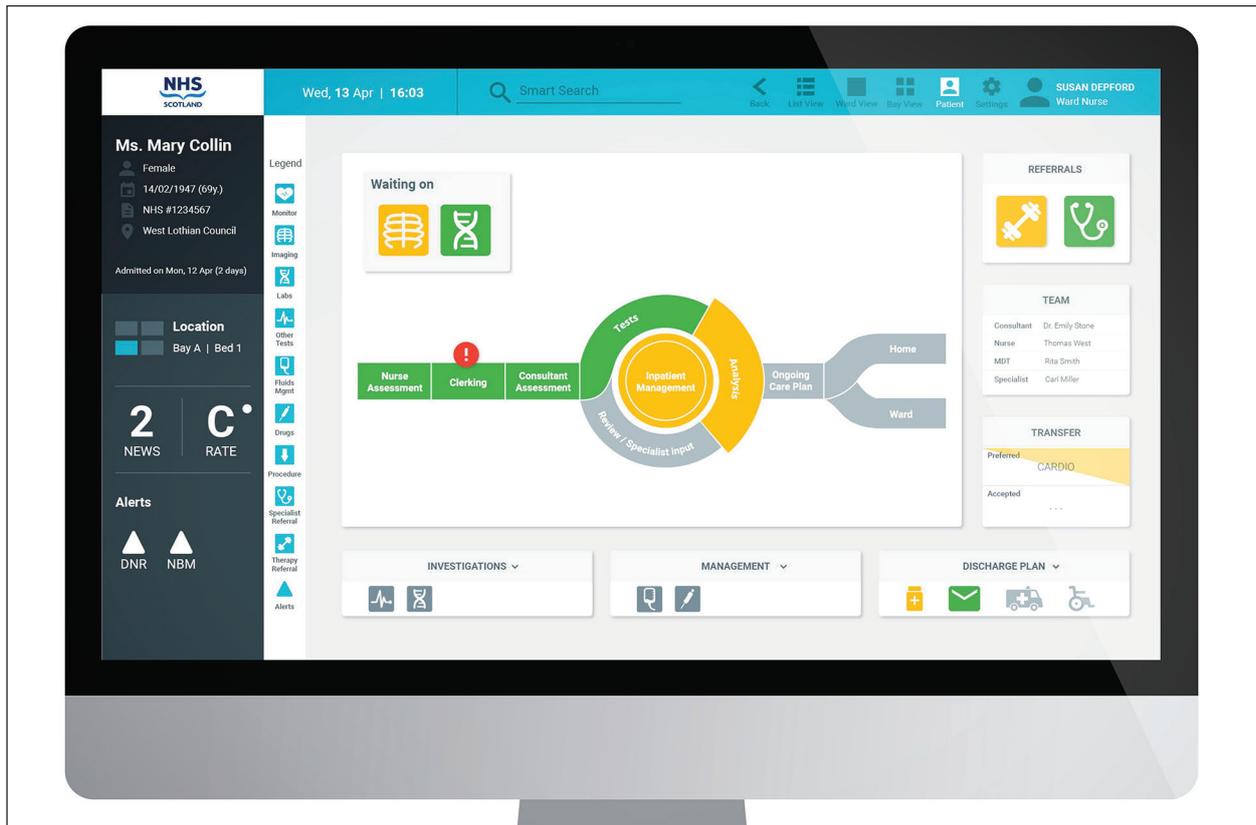


FIGURE 4 Patient Flow Smart Board

located within that journey at any given time (Figure 3). The visualisation of the care plan and depiction of outstanding tasks can motivate staff to carry out tasks, promoting behavioural change.

During the development of this visual communication tool the design team tested its effectiveness through iterations of the iconography, colour, legibility and visual language employed. Hospital tasks and processes were mapped and grouped with the assistance of clinical and hospital teams to ensure its accuracy and usability. The hospital teams appreciated the simplicity of the visual language, its applicability and flexibility of use. Multidisciplinary team members found the diagram holistic, allowing for collaboration and empowerment across teams.

Patient Flow Board

Whiteboards are still widely used by AMUs across the country as a reliable way of recording patient status, in terms of tasks to be performed, diagnosis, location, and the care team responsible. However, if they are not updated accurately and promptly their reliability is drastically reduced, leading to errors, delays or duplications.

Similarly, digital boards (currently used by better-resourced hospitals) are also imperfect tools because the software doesn't always fit the needs of the medical team. To compensate, the teams sometimes try to keep track of

developments by duplicating the information in analogous ways. Indeed, digital tools are sometimes abandoned altogether as the IT cannot keep up with the needs of the care team.

The Patient Flow Board developed by the design team is a digital system that depicts the patients' journey graphically (Figure 4). This board employs the 'Visual Care Journey' diagram and ancillary iconography to represent information already available in current Patient Administration Systems. The aim is to change the care team's behaviour in ways that will improve patient flow, e.g. flagging up when an examination needs to be chased up, or a medical review undertaken that will allow faster discharge to home, if this is the right outcome for the patient.

The hospital teams have seen the benefit of the Patient Flow Board in checking progress and coordinating work streams of different teams while enabling future task planning. Teams also highly value the fact that no manual input is required as the tool extracts all of its information from existing data. A demonstrator of this tool has been developed, and a small-scale pilot is being organised for February 2017.

Analogue Board

An analogue version of the Patient Flow Board is also being developed for sites that do not possess the IT

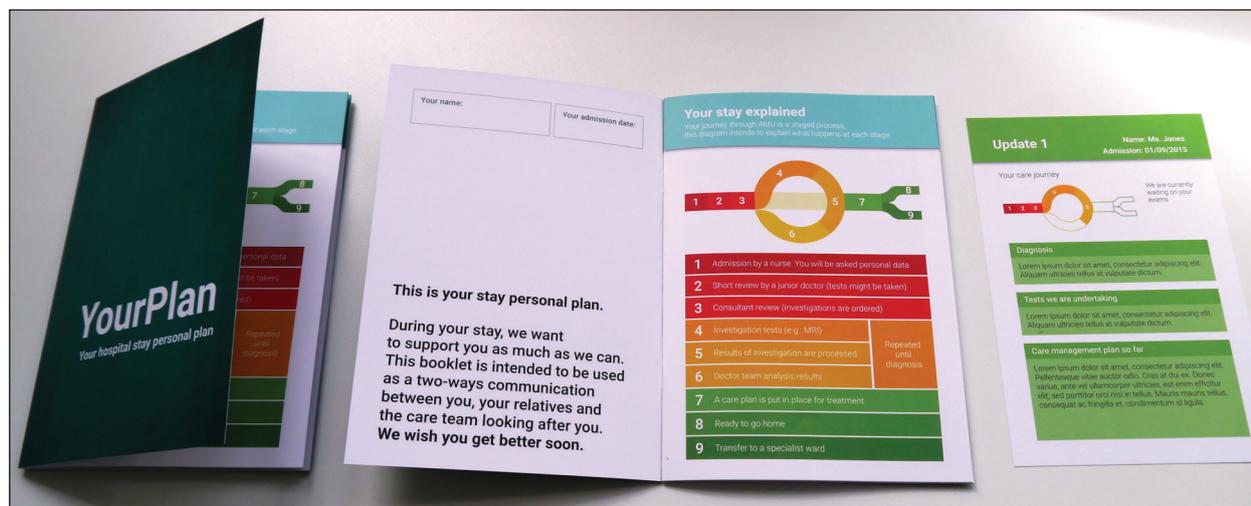


FIGURE 5 Patient Update booklet prototype

infrastructure necessary for a fully integrated software tool. The analogue board also makes use of the same ‘Visual Care Journey’ diagram, patient care information and ancillary iconography, manually updated. The aim of this tool is to serve as a stepping stone between the traditional whiteboards and the eventual digital board.

This tool has some limitations in respect of layers of information achievable, compared with the digital version, and lacks its automation. Nonetheless, the teams value the visual depiction of patient journeys for closer collaboration. The design team is now investigating the applicability of this model across other hospital departments in selected wards downstream of the AMU.

Patient booklet

Patients and relatives have frequently observed that communications could have been better when they were being informed or updated on their diagnosis and care plan. They felt this had affected the quality of their care, their ability to contribute to the medical decisions taken, and on their eventual discharge. To improve this, we have created a patient care booklet as a communication tool between ward and patient, and, in future, with community care providers (Figure 5).

The booklet explains AMU care, manages expectations while keeping patient and family up to date on the development of the patient’s care, and outlining the next steps. The hospital teams envisage that this tool will provide distinct benefits, but have flagged up that it can be time consuming to update. A prototype version of the patient booklet is currently being tested in three hospitals, and a new iteration is under development to address any concerns identified.

IMPLICATIONS AND NEXT STEPS

The design outputs are being tested in close collaboration with the project’s stakeholders, involving them in validation sessions and small-scale pilots incorporating their feedback at each stage of testing.

Further, there is some debate as to whether a digital or an analogue intervention might be better for a given hospital and to promote adoption it will be crucial to implement chosen technologies that complement current staff behaviours. Further work can also be carried out to explore ways of using visualisation and technology to promote behaviour change at work in the provision of healthcare.

The current visualisation of the care journey has been very well received by hospital staff, although the extent to which it should be shared with patients remains the subject of some discussion, in terms of the impact this might have on their expectations of performance and speed.

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