

INITIAL POST IMPLEMENTATION REVIEW

Project Title: Patient FLOW System

Executive Summary

Hospitals in Ireland are facing operational strain due to increasing bed demands and patient volumes and shortage of healthcare workers. The Patient FLOW system introduced by St. Vincent's University Hospital (SVUIH) facilitates quick access for patients to the appropriate bed and treatment by supporting an efficient throughput pathway.

In a busy Level 4 hospital it is critical that our clinical staff have a 24/7 real time overview of patients and their location. It is also critical that the bed management team have a tool that allows them to maximise the hospital's bed compliment for the benefit of patients.

From a clinician perspective, we needed to know "Whose care are the patients under and where are they located". From a bed management perspective we needed to be able to predict patient activity and have full clarity on bed capacity. From a nursing perspective we needed a bed management and 'productive ward' combined system to replace the physical 'dry wipe' whiteboards with intelligent touchscreen technology. This would allow staff to update patient data seamlessly with clinical icons which provide 'patient status at a glance'. From a management perspective we needed reliable 24/7 real time data on bed utilisation and the movement of scheduled and unscheduled patients. This would also provide comprehensive reporting capability on all key milestones of the patient journey. Another focus was to reduce the reliance for manual work flows and release 'time to care'.

Supported by the HSE, SVUH's clinically led Medical Executive ICT Group and the SVUH Executive Management Team implemented the 'Patient FLOW' system to achieve these objectives. In many public hospitals the scheduling, admitting, transferring and discharging of patients is semi-automated and paper based processes reliant on administrative staff who primarily work business hours and record patient status retrospectively.

The processes are very challenging and labour intensive, for e.g.:

- Handwritten updates to patient census diaries, ward “dry wipe” whiteboards, discharge planning “dry wipe” whiteboards amongst other transient scheduling and waiting lists.
- Twice daily bed allocation and discharge meetings between nursing and bed management staff.
- Twice daily ward walks by Admissions staff to understand and document the patient census
- Discharges performed retrospectively the following day by administration staff using the paper patient census which would have been completed by nursing staff previously.

Introduction

This post implementation review was carried out six months into production to evaluate the effectiveness of the Patient FLOW system. The main objective of the review was to determine the success of the system in supporting users, delivering the projected functionality and formulating recommendations from lessons learned.

St. Vincent’s University hospital is a tertiary referral university affiliated hospital providing emergency and medical/surgical care for a number of specialities. The hospital has a capacity of 614 inpatient beds both medical and surgical with multispecialty outpatient service and diagnostics. It is the national centre for liver and pancreatic transplantation. The multifaceted care provided by the hospital includes a multidisciplinary team who work around the clock. It is therefore fundamental to identify the correct patient and know the real time location of the patient receiving care.

Objectives

St. Vincent’s University Hospital required a user friendly patient FLOW system that would deliver key goals such as improved patient experience times in ED, reduced length of stay for inpatients and ability to have a real-time patient census. In order to achieve our objective of real time at a glance 24/7 patient census, we needed to update patient journey status 24/7. In real terms this meant a

fundamental shift from the patient's journey being captured exclusively by administrative staff to where this would be carried out by nursing, bed management and administrative staff.

The over-arching key objectives of the project were to achieve:

1. 24/7 real-time patient censuses for all inpatients on every ward.
2. Improve patient care by enabling consultants to know the exact location of their patients at all times to facilitate consultation visits
3. Improve patient care through higher visibility on patients clinical needs such as, infection control status, AHP referral status, falls risk status, dietary needs etc.
4. Maximise bed capacity and improve patient experience by increasing discharge rates and reducing 'Length Of Stay (LOS)'.
5. Reduce the labour intensive activities involved in finding a vacant bed, admitting, transferring and discharging patients.

Project Approach

Having gained approval and financial support from the HSE and OGIO we completed a competitive European tender was issued. This comprised a detailed set of functional requirements with the goal of implementing a user-friendly, app-like, leading edge, intuitive system. Servelec were awarded the contract to provide the solution meeting all criteria and requirements of SVUH patient journey.

Project Communication

A range of communication mechanisms were used providing weekly updates through steering committee meetings, emails, Working Group meetings, all user emails specifically targeting each group of audience, Nursing Memos etc.

Due to the diverse mix of employees comprising of clinical and non-clinical staff there was a need for printed emails and memos to be circulated through the departments. A weekly update in the form of a status report was sent to senior management prior to the working group meetings. At a number of intervals pre-go live a daily update was emailed to all users highlighting wards that were in production. An organisational awareness campaign was carried out a month the before GO-Live date.

Technical Solution

The Patient FLOW System displays patient information at a glance on 35 large touch screens across 27 wards presenting patient demographic details and key clinical indicators on bed cards.

The system is interfaced with the ED Electronic system and Patient Administration System (PAS) which extracts both demographic details and ED clinical notes. The system is hosted as a web base application and is available on both touch screens and all networked PCs within the hospital making it accessible to users at all times. User login was made easier by enabling swipe access using an RFID reader. Role based access was given to users allowing them to only view information pertinent to their role/specialty.

Implementation

Project Initiation

A business case outlined the requirement for an electronic patient FLOW system to streamline inpatient flow within the hospital. A governance structure was formed which entailed an ICT medical executive project board, steering group and a project team.

A scope document was prepared to define the roles and responsibilities and to identify work to be completed within the project. The project scope was agreed upon by stakeholders and a working group was formed. The project team met every week to discuss completed task and deliverables. Project status report was circulated weekly highlighting status and progress.

Design and specification

- An 'As Is' process was documented to highlight the current processes and the changes required which would progress to develop the 'To Be' process. Requirement documents were prepared at the workshops conducted with departments like nursing, bed management, statistics, admissions and other departments within the hospital ad hoc. Primary focus was given to obtaining 24/7 real time patient census while focus was also given to documenting and capturing relevant information from dry physical boards. These requirements defined the To-be process document. These specifications were signed off by the project team and the

steering group and were brought to the vendor who modified their solution to suit SVUH needs.

Interfacing

- An interface was built to communicate with the ED system and PAS system. This would enable seamless transfer of patients from the emergency system to the whiteboard system. The interface to the PAS system was a bidirectional interface.

Testing

- User Acceptance Testing was carried out by the Lead Users of all relevant departments at the workshops.
- Three months before Go-live the interface was switched on from live PAS to Test System environment which enabled us to volume test the interface with live patients and also identify and resolve any discrepancies.

Training

- Training strategy was created to deploy training among 1500 circa staff. Six week classroom training was provided to super users who cascaded training to the wards and other departments. 70% training was completed three weeks prior to Go-Live. Refresher training was offered at ward level two weeks into Go-Live and two weeks into production by means of ward-walking.

Go-Live

- A cut-over plan was created at vendor and stakeholder workshops to organize several components of Go-Live and support. All users were set up weeks in advance, giving them role based access to the system. A deliberate phased roll out was adopted rather than a big bang approach. The Acute medicine ward was chosen as the initial Go-Live ward, as it is a high volume area and a significant entry point for patients. This ward would enable us to capture and highlight any issues with the system. This having gone well, all 26 wards were live in the next five days.

Support

- Pre Go-Live a broad team was established comprising of ICT, other department members and vendor to provide hands-on support at ward level 24/7 for a sustained period. This was carried on at a high level for a month and continued on a receding basis for the next couple of months. This team of “ward walkers” were contactable by dedicated mobile phones at all time. This was a critical success factor for the project as it ensured that our staff, particularly

nursing staff, had confidence, additional training and issues were captured and resolved quickly.

Post Implementation Outcome

Outcomes

The core aims of this project were

- To deliver an accurate 24/7 census and bed status
- To provide our Bed Management team with an accurate picture of bed demand, both scheduled and unscheduled and effective tools to allocate those patients to vacant or upcoming vacant beds
- To provide clinical staff with a range benefits in recording status updates on patients journey

All of the above has been achieved.

➤ Real Time Census

1. Previously with the paper based census and manual whiteboards it was very challenging to maintain a real time census for 26 wards across the hospital with several points of admission. Admissions, transfers and discharges were updated on our legacy PAS retrospectively, which could be carried out two days later. The patient FLOW system has achieved on a 24/7 basis a 98% real time census with visibility of all inpatients.
2. To ensure an accurate census at all times checks have been put in place and are showing a high level of accuracy.
3. Clinical staff use their employee swipe cards to access touch screen FLOW system on any ward. The system is also accessible on any networked computer within the hospital.
4. Integrated discharge planning is achieved with the incorporation of a multidisciplinary process for ward rounds and navigational hub meetings. Predicted discharge date (PDD) is recorded on 98% of wards.

➤ **Optimising Patient Care**

5. Having visibility of real time Patient Experience Time (PET) for admitted Emergency Department (ED) patients as well as movement of patients to and from the Discharge Lounge has significantly improved PET results and compliance with HSE/SDU targets for patients on trolleys in ED. In conjunction with a number of other hospital initiatives, the Patient Journey system has assisted in a reduction of ED waiting times and an increased recording of Predicted Date of Discharge (PDD) and had a positive impact on the length of stay (LOS). In addition, PET statistics shows that SVUH is now frequently one of the best performing DATHs hospitals. A random week selected in March 2016 and 2017 showed that 51.6% of ED patients were admitted to an inpatient ward within 9hrs compared to a 31.3% in March 2016.
6. Planning care and intervention has now been streamlined easily as ED clinical notes are transferred seamlessly directly from ED via the interface available to the 'To come in' (TCI) area on the Patient FLOW system. This empowers nurses to coordinate care on their ward.
7. Infection status displayed on the bed card enables the bed manager to allocate isolation beds thus minimising risk of spreading infections and improving quality of care.
8. Manual whiteboards did not facilitate the use of dietary indicators. The FLOW system allows nurses and dieticians to clearly mark the dietary needs on the FLOW system's electronic whiteboard also proving an audit trail of new dietary modifications. This has provided both clear communication and improved patient safety.
9. Nurses can now raise an allied health referral (AHP) on the FLOW system which is displayed as stage 1 AHP referral. AHP's are able to create a list of referrals based on stages and plan their workflow and plan their delivery of care more efficiently.
10. Consultant care transfers were historically done retrospectively which would sometimes take up to 4-5 days but with touch screen access on all wards Consultants are able to record the transfer of care in real time. Patients are always displayed under the right consultant enabling easy ward round and consultation.
11. Portering can now locate patients correctly in real time. This supports them in efficiently moving patients to and from wards and department without wasting

time. This removes the process of trying to locate patients via phone calls and ward visits.

- 12.** Ward transfers would on an average take two hours per patient, requiring significant communication between bed managers and wards. With an average of 20 transfers a day this amounts to considerable time which can now be better spent on other clinical processes.
- 13.** Reducing ED waiting times and recording PDD have contributed to a reduction in average length of stay (ALOS). Recent statistics show that 84.2% of ED patients were admitted to an inpatient ward by 9 hours.

➤ Reduction of manual process

- 14.** Notwithstanding the fact that manual whiteboards were updated sporadically during the day it took considerable time to complete. The introduction of electronic whiteboard system has generated significant time saving for nurses.
- 15.** The representation of beds on the FLOW system present clinical indicators and demographic information which is visible to all staff. A patient can be searched by surname or hospital number by any clinical staff to locate the patient. This saves tremendous amount of time as previously clinicians and Allied health professionals would have depended on outdated information on PAS, phone calls to the wards or visit to the wards.
- 16.** A census ward walk was previously carried out by three administrative staff Monday to Friday which has now become redundant since the implementation of patient FLOW system. These resources have been reallocated.
- 17.** Details on all ED admissions are now transferred to the FLOW system once a 'Decision to Admit' (DTA) status has been entered on the ED application. As a result of this, there is direct time savings for ED admissions as the admissions are now carried out by nursing staff on the FLOW system.
- 18.** Nursing staff carry out discharges on the FLOW system in real time which was previously done as a batch discharge by administrative staff retrospectively the next day.
- 19.** On a daily basis, bed management carried out separate medical and surgical Navigational Hub meetings with nursing managers to update manual whiteboards.

These meetings could last circa two hours. Preparation for these meetings would take up to 30 minutes for nursing staff to attend the meeting and return to the ward. Since the patient FLOW system was implemented these meetings only took place thrice weekly (both surgical and medical) as oppose to daily.

➤ **Maximising bed capacity**

20. Bed management screen features supply and demand of beds. Real time discharges have given visibility to available beds and recording PDD has helped with forecasting supply.
21. Acute beds are made available by transferring patients that are ready for discharge to the discharge lounge. Some of these acute beds are allocated to ED patients thus reducing ED waiting times. Recording PDD has improved discharge rates. A data comparison for first quarter 2016 and 2017 showed the number of discharges raised by at least 20%.

Key Performance Indicators

Patient experience time (PET) depicts time spent in ED from registration to discharge home or to a ward. Higher PET % shows effectiveness in triaging and managing care of patients in Emergency Department which has direct impact on improved throughput time within the hospital. PET data is analysed based on 6hrs and 9hrs target. A fully integrated FLOW system allows for visibility of bed capacity and potential vacant beds within the hospital. It also allows for forecasting demand and supply for busy periods. Forecasting capacity reduces overhead cost per inpatient bed which is accounted as nearly half of the hospital costs.

Below figure 1 shows SVUH performance over other hospitals in DATH for the first quarter of 2017. SVUH has an overall high PET for 2017 first quarter. Certainly KPI has improved with the introduction of FLOW system and several other initiatives like the productive ward and discharge lounge which were undertaken in the last 24months to improve patient FLOW.

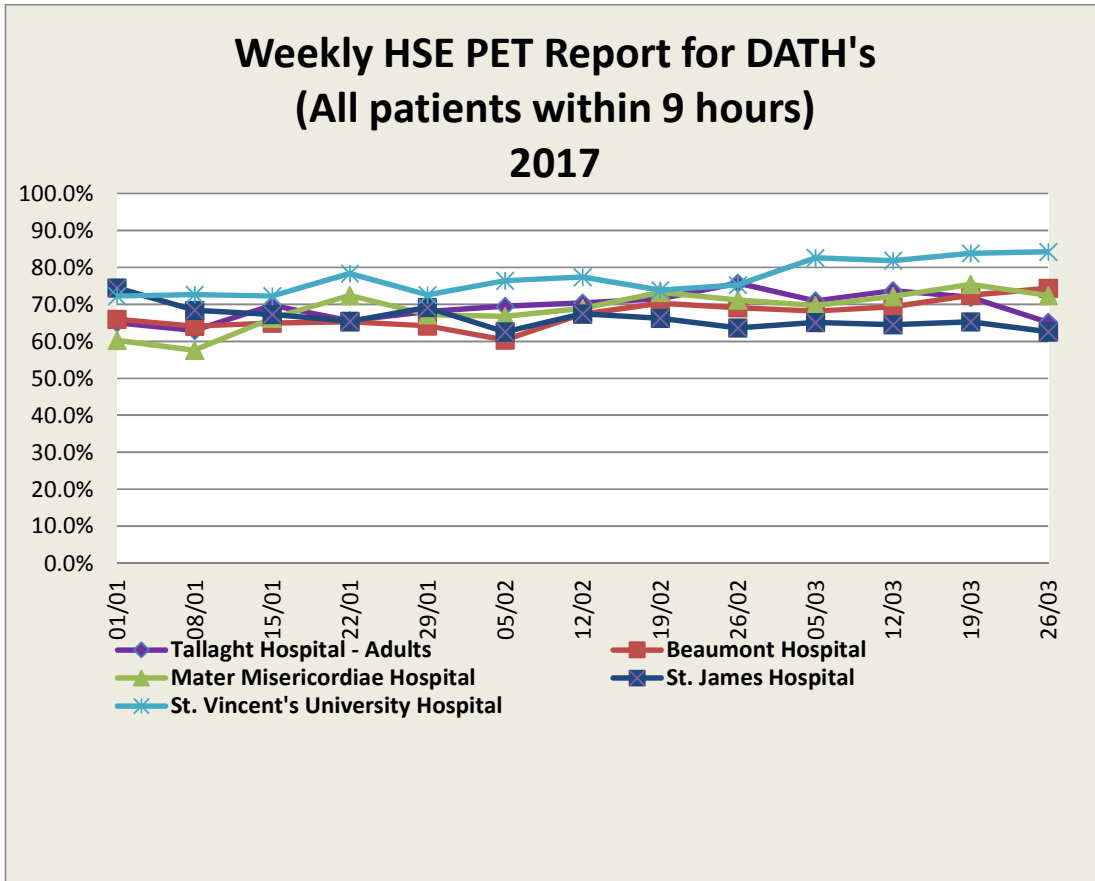


FIGURE 1

Below Fig.2 displays time in hours that was spent in ED before being admitted or discharged and both. It is important to measure this time and see an outcome when using a FLOW system. Although bed availability depends on several factors one of the major factors is having a robust FLOW system that provides visibility of vacant beds.

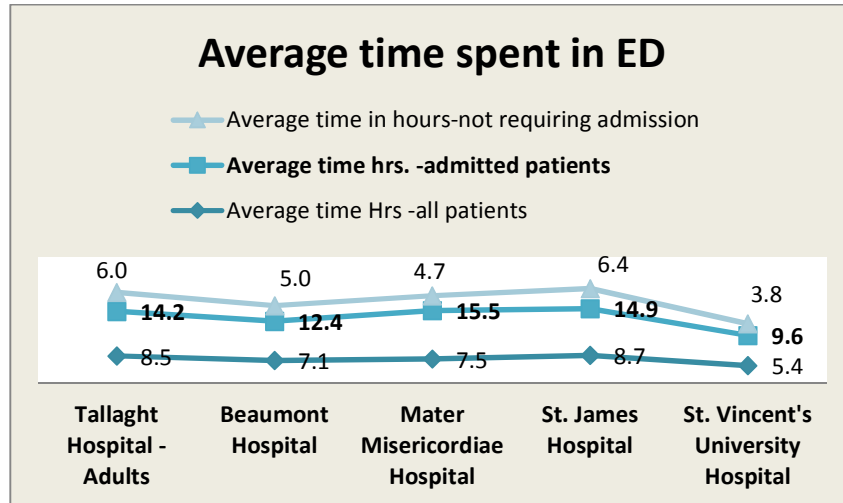


FIGURE 1

Below figure 3 displays PET for admitted patients for first quarter 2016 when SVUH had a manual FLOW system and first quarter 2017 when FLOW system was 3 months into production.

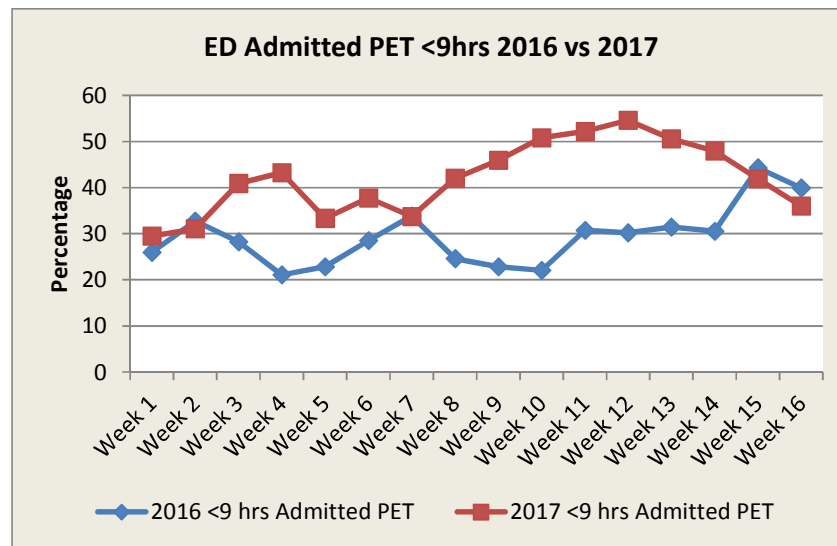


FIGURE 3 –TWO 4 MONTH PERIOD GRAPH

Conclusions

In closing, the aims noted at the start of this document were successfully achieved in:

- Delivering an accurate 24/7 census and bed status
- Providing our Bed Management team with an accurate picture of bed demand, both scheduled and unscheduled and effective tools to allocate those patients to vacant or upcoming vacant beds
- Providing clinical staff with a range benefits in recording status updates on patients journey

Next Steps

- SVUH are continuing to develop the product with the implementation of the NOTGE element of the system which can provide benefits relating to the capture of clinical notes.

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