NETIMIS

CASE STUDY

Modelling Improvements to the A&E pathway in the Doncaster & Bassetlaw Teaching Hospitals

Client: DONCASTER ROYAL INFIRMARY

Overview

This case study has been conducted as part of an undergraduate project for the University of Leeds in collaboration with X-Lab and Doncaster and Bassetlaw teaching hospitals. It involved working with a clinician to investigate the feasibility, acceptability and productivity of introducing a new patient history collection software (SMART-ER), into a minor injuries emergency department waiting room. The purpose of this was to estimate the potential reduction in accident and emergency waiting time, with the use of alternative pathways.

Urgent and Emergency Care services, with over 21 million annual attendances in the UK, is currently under huge pressure to deliver on key performance indicators and provide an up-to-date quality service fit for the future. One measure of ED performance is the percentage of patients whose total time in ED is less than four hours. 2015 saw the lowest annual performance on this measure for a decade, with 7.0% of patients spending over 4 hours in A&E – 10.5% if we consider only major hospital A&E departments. The waiting times are ridiculous and results in an overall poor service. This suggests that waiting time could be reduced through introduction of a new technology. This new technology will look to reduce the waiting times of patients as well as reduce the time taken for clinicians to extract information that can be carried out by the patient themselves. This case study will look at making the overall process more efficient through the introduction of this new technology.

About this Study

As part of the Doncaster and Bassetlaw Teaching Hospital Trust, Doncaster Royal Infirmary aims to provide effective inpatient services for Doncaster and other communities across Yorkshire. In an effort towards achieving their goals, the accident and emergency department have introduced a pathway for a new software technology. The core aim is to improve the waiting times in a standard accident and emergency pathway.

SmartER is a solution that has been created to help the patient engage while they are waiting. This waiting is referred to as down-time. During this time patients are asked to start the process of consultation while they wait, by using this new software technology. The aim is to make down-time a productive part of the patients journey. This leads to a much safer and better quality of care, which reduces the strain of the emergency department. A secondary feature of this new software technology is that it enables the improvement of data collection and range, while the patient waits. Allowing for outreach support after the patient is discharged from care.

SmartER is combining emergency health service with innovative technology. Patients are tasked with filling a number of questions in the emergency waiting room. Questions are aimed at helping identify ailments and injuries as well as general health details. This is carried out while the patient waits for the assessment.

Upon completion of this process the patient will have explained the purpose of their visit. As well as other general health details. This information will then be stored in said patients medical record. This whole process will lead to an improvement in communication with the doctors of the emergency department, it aids the clinicians and most importantly makes use of the patients waiting time, which in turn reduces waiting time overall.

Challenges

There have been many efforts that have been put in place to try and improve the efficacy of Emergency Department processes in order to improve the overall performance. However, most exertions have been focused generally on items such as the care of the patient after the initial consultation which is often taken place or after the patient has been waiting for a significant amount of time. The patient that was waiting decades ago is not the same as the waiting patient of today for a number of reasons. The core reason being the patients of today have the availability of immediate information. The patient of today has more medical information available to them on smart devices while they are waiting in comparison to the clinician that they may see after a number of hours waiting. Whilst many of this is known nothing much has changed. Patients are still treated like that of old, with little to no exchange of information between the patient and clinicians whilst they are waiting. The aim is to prove through modelling the down-time of patients. Through bottle-necks found in the current A&E pathway and then creating ways in which this down-time can be made more useful.

Method

By replicating the current accident and emergency pathway found within Doncaster and Bassetlaw Teaching Hospitals. A realistic model was produced which successfully highlights the pathway, problems with the patient flow, bottle necks in the patient pathway and models for improvement. The process of constructing the model was a combination of both quantitative and qualitive investigation. Most of the anonymised patient data was either obtained through the hospitals themselves or collected through interviewing NHS staff members. The information was then used to develop

the NETIMIS model structure and then the model was populated with real patient data values that was obtained.

Solution

To improve the current existing pathway multiple models will be created, the structure of the models will be of two types. One before SmartER and one after. The Data will remain the same to highlight the improvements between both. This is to highlight the improvements. This will show that SmartER is a solution which has been developed to help engage patient whilst spending a number of hours waiting (Down-time), By means of asking patients to begin the process of consultation, by using an innovative software technology. This will lead to down time actually becoming a productive element of the patients journey. Which in turn will lead to better quality and safer care.

NETIMIS was used to first create a model of the current pathway before the new pathway with SmartER was introduced. A combination of anonymised data from Doncaster Royal Infirmary as well as interviews were used to extract data that was then used to model a real-life accident and emergency pathway.

NETIMIS was again used to create a model in a future state which signifies the use of SmartER. Further interviews were carried out to create a suitable model, which clearly showed the new pathway in action.

Conclusion

We are able to conclude that SmartER is in fact a valuable new software creation. The initial implementation of the application in the emergency department has shown positive results. The models are an evidence of the successful transition of workflows. It is very clear that clinicians save more time with usage of SmartER. This is during the stages when the patient is treated as well as writing the report for the patient. This results in time saving which allows for more patients to be seen and overall improve the productivity of the workforce. Further work is recommended before making drastic changes based on the results of the modelling. Other models based on different patient demographics such as age and ethnicity as well as staff rotas can be created to improve the overall model and be more reflective of a real-life medical scenario.

Through a successful partnership between Doncaster and Bassetlaw Teaching Hospital and X-Labs a number of models were created. The models successfully illustrate the pathways in their current state and future state. NETIMIS was able to help in assuring the accurate representation of the pathways through simulation. Through successful analysis it was concluded that fully implementing the future state pathway would result in a decrease in down-time whilst also ensuring that patients are productive whilst waiting.

Figure 1:The Current Accident and Emergency care Pathway in Doncaster Royal Infirmary

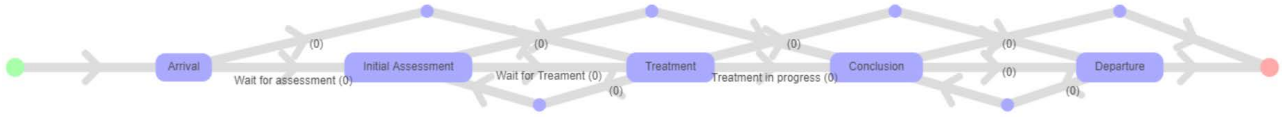

Figure 2 :The Future State Accident and Emergency care Pathway in Doncaster Royal Infirmary with SmartER