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"SEE AND TREAT" OR "SEE" AND "TREAT" IN AN EMERGENCY DEPARTMENT

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ABSTRACT

"See and Treat" in an Emergency Department combines the process of patient assessment with treatment in the expectation that it will increase patient throughput and decrease queuing. This paper describes an evaluation of the flow of minor emergencies in an Emergency Department in the UK that had partially implemented "See and Treat" and was planning to reorganize the department yet again to re-separate the activities of assessment and treatment. A discrete event simulation indicated that the proposed system in which "See" and "Treat" were separated improved patient throughput and was likely to be more cost-effective. There were difficulties in obtaining credible data for the analysis, though this was mitigated by using the same distributions, for the analysis of both of the systems. With increasing pressure to introduce industrial concepts, such as Lean, to the health sector, simulation provides a means of assessing expensive and disruptive changes before implementation.

1 INTRODUCTION

Applications of industrial technologies to the public sector are based around the concepts of Lean (Womack and Jones 1996) and Six Sigma (Pande et al. 2000). In the Health Service in the UK, these initiatives were led by an agency of the Department of Health called the Modernisation Agency, now replaced by the National Health Service Institute for Improvement and Innovation (NHSI). They focus on (National Health Service Institute for Improvement and Innovation 2007):

- Reducing waste, such as unnecessary activities and travel time,
- Cutting waiting time and
- Improving quality by reducing errors.

One of the initiatives recommended by the Modernisation Agency was: "See and Treat" (The NHS Modernisation Board's Annual Report 2003). This is summarized by Rogers, Ross and Spooner (2003) who state that: "This process is based on the principle that one clinician is able to see, treat and discharge the patient after initial assessment, thereby reducing the length of time these patients stay in the department."

2 MINOR INJURIES AND INVESTIGATIONS

This paper is based on a case study of the treatment of minor injuries and medical problems in an Emergency Department in England. All arrivals are unexpected and unplanned and those with minor injuries or medical problems are routed to the "Minors" part of the Emergency Department by receptionists. The majority of minor patients will be discharged from the Emergency Department within one to four hours.

Emergency Departments have a class of nurses called Emergency Nurse Practitioners (EPNs) who are qualified to assess and treat minor injuries but not to deal with a range of "minor" medical conditions which are still seen by doctors. A full implementation of "See and Treat" should include the following (The NHS Modernisation Board's Annual Report 2003):

- The abolition of a triage nurse, replaced by the receptionists directing incoming patients to the appropriate queue;
- Doctors and ENPs attached to the Minors section of the Emergency Department, to assess and treat patients seamlessly in order of arrival;
- Doctors attached exclusively to the Minors part of the Emergency Department for any particular shift.

With the implementation of "See and Treat" a patient is not delayed by a triage system and then will not queue between seeing a doctor or nurse and receiving the prescribed treatment. The same number of doctors will always be available in any particular shift, facilitating the patient flow. It appears, therefore, that in "See and Treat" patients should flow through the system more smoothly with less wasted time.

3 CASE STUDY OF "SEE AND TREAT"

In the case study hospital, "See and Treat" had been partially implemented in the Minors part of the Emergency Department. Approximately 30% of patients had conditions that were thought to need to attention of a doctor rather than an ENP. The rest of the patients could see a doctor or an ENP, depending on which was available first. The receptionists identified which patients should see a doctor rather than an ENP and sent more serious problems to the Majors part of the department.

The ENPs each had a cubicle where they assessed the patients, sent some to the X-Ray Department (approximately 48% of those they saw) and advised and treated the rest. Those patients requiring an X-Ray returned to the same ENP for advice and treatment; after the X-Ray, they were given priority for the ENP, ahead of the queue of new patients.

The doctors did not change their behavior but continued to work as they had before the attempted introduction of "See and Treat". Those patients requiring treatment, such as dressings, were sent to a nurse. The doctors divided their time between the Majors and Minors parts of the Emergency Department.

The ENPs were, therefore, attempting to operate "See and Treat" as intended and the doctors were not. This was clearly unsatisfactory and so there was a proposal to change the arrangements so that doctors and ENPs would behave in the same way. Doctors would spend a whole shift in either the Minors or Majors section but would not move between the two. The ENPs and the doctors would each occupy a cubicle. Those patients needing to see a doctor would be in one queue and those need to see either a doctor or ENP would be in the other queue. The doctors would select from either queue and ENPs would select from the second queue on a first-come-first-served basis. The difference between this system and the one that was currently operated by ENPs was that, regardless of whether a patient saw the ENP or the doctor, treatments were to be carried out by less qualified nurses than the ENPs. The benefit of these changes would be that by using less qualified (less well paid) nurses to do the treatments, there would be a more efficient use of resources. It is a "See" and "Treat" system rather than "See and Treat". Many patients would have to wait in queues, however, for treatment following the advice given by the ENP or doctor.

4 SIMULATION OF MINOR EMERGENCIES

The current system and the proposed future system were modeled in Simul8. Figure 1 shows the model of the proposed future system.

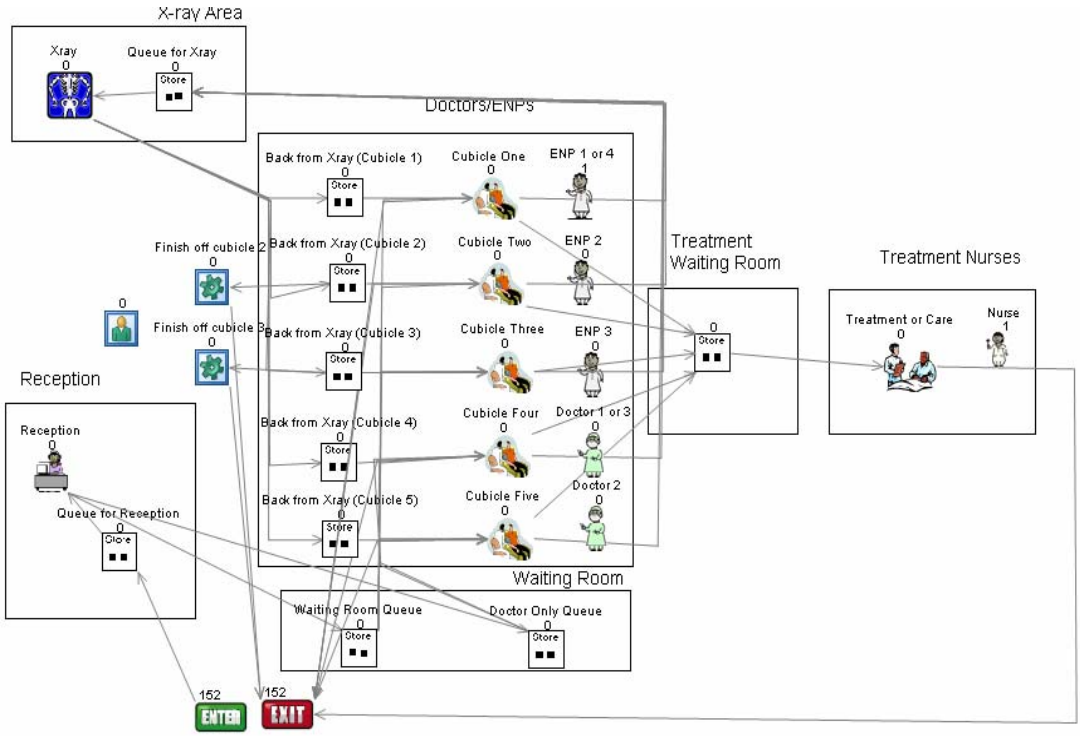

Figure 1: Simulation screen showing pathways for the proposed scenario, using Simlu8.

Five main types of patient were identified as requiring:
Type 0 – assessment by a doctor, followed by treatment and discharge
Type 1 – assessment by an ENP or doctor and discharge (no treatment)
Type 3 – assessment by an ENP or doctor, treatment and discharge
Type 4 – assessment by an ENP or doctor, X-Ray, advice, treatment and discharge
Type 5 - assessment by an ENP or doctor, X-Ray, advice, treatment and plastering and discharge.

In the model of the current system, the ENPs gave the advice and did the assessments and treatments but sent patients away for X-Rays. The doctors did the assessment, gave the advice but sent the patients to a nurse for treatment, as well as sending them away for X-rays.

In the model of the proposed future system, the ENPs and the doctors behaved in exactly the same. Each stayed in the Emergency Department for the whole shift. They gave advice and did the assessments but sent patients away for X-Rays; both doctors and ENPs sent patients to nurses for treatment. The number of doctors was reduced by one so that the resources provided were similar to those in the current system.

Table 1: Results from the simulations comparing the current system and proposed future system for the Minors section of the Emergency Department.

Current system			
	Low 95%	Mean	High 95%
Average time in system	114	128	144
% completed in four hours	90	93	97
Average time in waiting room	58	71	83
Average time in doctor queue	85	103	122
Proposed system			
	Low 95%	Mean	High 95%
Average time in system	89	97	105
% completed in four hours	95	97	99
Average time in waiting room	16	21	25
Average time in doctor queue	79	98	117

The data provided by the Emergency Department purported to show the time at which the patient was seen at various points in the pathway. It proved to be consistently reliable only for the arrival time and the leaving time. Times for the different stages in treatment were estimated from the records that appeared to be complete. These times were then fitted to distributions and the parameters entered in the simulation program.

Table 1 shows that the proposed system performs much better than the current one. This is because there is more effective use of EPN time, which is important at times of peak demand, and also a consistent supply of doctors throughout a shift. The separation of "See" and "Treat" appears to have been beneficial. There are still delays in the proposed future system, particularly in the queue for doctors. This indicates that either more doctors are needed at particular times of day, or the EPNs need to cope with more of the work that currently goes to doctors.

Clearly our lack of confidence in the data will translate into a lack of confidence in the results. The times for the different activities were however matched up between the two scenarios tested and so the comparative results are credible. The two systems have similar overall resource use, and hence costs.

5 CONCLUSIONS

Clearly there are problems with "See and Treat". The first is that is difficult to get "buy-in" from all the key personnel. In our case study, the ENPs had adopted it but the doctors had not. Even the ENPs, who believed that they were operating the system correctly, would sometimes distort the system by creating sub-queues of patients outside their cubicles to reduce the effort in walking to the waiting room between each patient.

There has been considerable debate (e.g. Lamont 2005, Ellis 2005) about its benefits and some doctors argue that priority should be given to very sick and not minor emergencies. We have not looked at the effect on major emergencies of completely separating the doctors between the minor and the major patients.

It is apparent from our analysis that whilst putting two activities, such as assessment and treatment, together to reduce the number of stages the patient passes through it does not necessarily reduce the waiting time. This is because the highly qualified personnel, in this case the ENPs, have to spend longer with each patient and as they are in limited supply, when the system is busy, the patients have to wait longer.

Simulation is the ideal way to analyze a system in which individuals go through a series of queues and service points. The problem is that we need detailed data on the work activities of doctors and nurses. Self recorded data is known to be inaccurate. People may forget or enter the details of several patients for the same time or distort the data for reasons of their own (e.g. to cover up a long lunch hour). Another possibility is for the modeler to observe activities, but this is unlikely to be popular with those

observed. It is also known that people behave differently whilst under observation. The data collected therefore will only ever be approximate and will have to cross-checked and validated against observed queue lengths and the total measured times in the system.

"See and Treat" is one of the improvement methodologies recommended by the Modernisation Agency of the Department of Health in England (The NHS Modernisation Board's Annual Report 2003). These methodologies are concerned with reducing wasted activities and increasing patient flow. The adapted Lean methodologies currently in use work directly with organizations to change their behavior without the use of models to assess their potential benefits or disbenefits (Radnor et al. 2006). As modelers, we must enter this field with caution, however, because we are observing complex human systems which often do not behave as we expect them to do. There is, nevertheless, a tremendous opportunity for the use of simulation in this context.

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