

VALLEY HOSPITAL: MANAGING PATIENT FLOW IN THE EMERGENCY DEPARTMENT

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Valley Hospital is a tertiary care hospital which services the immediate city of approximately 38,000 people. Valley is also part of a metropolitan community of four counties that has a total population of less 400,000. Each of the counties has a major population center with its own hospital. Over the last 15 years, Valley Hospital remodeled and enlarged its bed capacity as well as the size of its emergency department (ED) to keep up with the population growth of the community. As with most ED's in hospitals, Valley Hospital had seen an increase in the number of patients and different types of cases which then increased the door-to-doctor, door-to-discharge and door-to-admission times. Dr. Tom Monroe, the acting director of emergency services, reviewed the data measuring door-to-discharge and door-to-admission times and felt that there must be a better way to manage the ED patient flow. He felt pressure from the community as well as hospital administration to reduce wait times and increase the productivity of the ED.

The primary subject matter of this case is the coordination issues in an ED. Secondary issues include discovering and understanding the major chokepoints in the flow of patients and suggesting some solutions to overcome them. The case has a difficulty level appropriate for senior students or first-year master students in an Operations Management or a Process Improvement in Healthcare course.

INTRODUCTION

It was Tuesday, March 2010 when Dr. Tom Monroe walked into the emergency department (ED) of Valley Hospital, where he was the attending physician for the next shift. He knew that he was in for a very long shift when he saw the nearly full patient status board and the backlog of patients waiting to be seen. As a trained ED physician, Dr. Monroe was quick and rational in his decision-making process. He

knew lives depended on it. Dr. Monroe, also the acting director of emergency services, had been at this hospital for more than 10 years and days like today were becoming the norm.

Dr. Monroe had started as a young physician at Valley Hospital, a tertiary care hospital with an ED. The hospital served the immediate city of approximately 38,000 people. Valley was also part of a metropolitan community that had a total population of just under 400,000. The emergency team usually consisted of the ED physician, physician assistants, nursing staff, assistants, and specialists. Nurse practitioners (NP) and physician assistants (PA) could perform most of the same duties as a doctor. Patient care assistants (PCA) supported the ED with several tasks including drawing blood, transporting patients, obtaining lab specimens and getting electrocardiograms. Specialists from other departments in the hospital were called in to assist depending on the needs of the patients. The emergency response team all worked together evaluating and treating the patient.

Over the last 15 years, Valley Hospital remodeled and enlarged its bed capacity as well as the size of its ED to keep up with the population growth of the community. The hospital was not the only thing changing. Dr. Monroe had thinning hair which he jokingly blamed on his wife giving him a bad haircut. His two daughters were grown up and in college, so family life was not what it used to be. At least he was still as skinny as when he was 25, probably due to his habit of jogging almost every day.

NON-EMERGENCY PATIENTS

One thing that Dr. Monroe could not run from was the status board that showed 30 patients at different triage levels. He thought to himself that ED care had changed drastically in recent years. Dr. Monroe noticed that about 20 of those patients were non-urgent, the lowest level of acuity on most triage acuity systems (Travers, Waller, Bowling, Flowers & Tintinalli, 2002). The trend of patients coming to the ED for their primary care was growing (Shaw et al., 2013) and increased every year. One of the biggest problems facing a traditional ED was this increase of non-emergency patients (Carret, Fassa & Domingues, 2009; Tyrance Jr, Himmelstein & Woolhandler, 1996). Many patients had no insurance, had insufficient coverage, were unable to get in to see their primary care provider, or were new to the area with no family doctor. The increased volume of non-emergency patients made it more difficult to care for the sicker patients, affected the quality of care, and increased the costs of providing emergency care.

With more non-emergent patients in the ED, patient treatment tended to be more challenging. Dr. Monroe felt things went more quickly when a patient was

classified as an emergency. During an emergency case, a dedicated team of resources was assigned for diagnosing and treating the patient. All the departments pulled together and performed as an efficient team. For patients who were classified as non-emergencies, the flow was not as effective. Treating every patient in the ED as a critical case would require a massive investment in dedicated resources. As one physician mentioned at the hospital, “I cannot have a runny nose team same as I now have a stroke or heart attack team.” The ED had tried to add some dedicated resources such as x-ray capabilities but doing this with all that was needed in the ED would not be cost effective. So, they still had to rely on outside resources. Dr. Monroe was caught in the dilemma of how to improve patient flow without increasing the cost to such an extent that the ED was no longer viable.

THE HAND-OFF REPORT

Dr. Monroe began his shift with a hand-off report. He was told that Mr. Jones, in room #1, had a series of tests ordered but they were still waiting a chest x-ray and for blood to be drawn. Only a urinalysis was completed. In room #2, Ms. Gorton had a suspected drug overdose. Blood for the toxicology screen had been drawn and sent to the lab. They were waiting for a catheter to be inserted to collect the urine for a urine sample. Mr. McCartney, in room #3, was suffering from a head trauma. All the lab work was done, and the results were back. The patient was waiting for radiology to do his Computed Tomography (CT) scan and he had been waiting for about 30 minutes. Dr. Monroe was told that, although radiology was ready, the ED did not have the staff to take the patient there. Now they were scanning a stat case from the Intensive Care Unit (ICU). Mr. Perez in room #4 had all the necessary tests, but some results were still pending. Dr. Monroe asked the ED clerk to call the lab and find out what was going on with the test results. The lab assistant replied that she was in the process of putting all the lab work for the last hour into the patients’ charts. Dr. Monroe noticed that, even though these patients had been in the ED for over five hours, there was no one with all their results ready. How could that be? Was it a lack of resources?

THE ETERNAL PROBLEM WITH HOSPITAL BEDS

Dr. Monroe was also informed during the handoff report that there were five patients with all their test results back who were just waiting to be discharged. There were four patients waiting in the ED for a bed to become available on one of the units, so they could be admitted to the general hospital. A considerable percentage of the patients admitted to the hospital came through the ED. The current four patients needed to be transferred to a critical care unit but were in a holding pattern. ED resources were drained when patients were being held in the ED to wait for a bed in the hospital; even though a patient was stable enough, he/she still needed to

be monitored and kept in an ED room until transferred. Then a new patient couldn't be admitted to an ED room until the room was emptied and cleaned, so the flow of patients came to a halt with some patients waiting up several hours to be assigned an ED bed. Lack of available patient beds on the units of the hospital had been one of the relevant reasons for backups in the ED (Hoot & Aronsky, 2008; Olshaker, 2009). Dr. Monroe believed that this was the most urgent issue to be resolved.

Patient flow in the ED was unpredictable. Many variables came into play, including time of day, time of year, catastrophic and unplanned events. The availability of hospital beds could also be unpredictable. Patient discharges usually took place during the day shift of the hospital but moving a patient from one unit to another could occur at any time. Also, there appeared to be patients who were not very sick but still using beds. This seemed to be the most frustrating factor for Dr. Monroe because he believed that, if he had more bed space available in the hospital, the flow in the ED would go much quicker. Patients lying in ED beds just waiting to be transferred to the main hospital prevented new patients from being seen in exam rooms. At the department head meetings, he kept stating that the hospital needed to come up with a plan to place patients in in-patient unit hallways or create some other holding center for these patients, to save the ED beds for those who needed them (Garson et al., 2008).

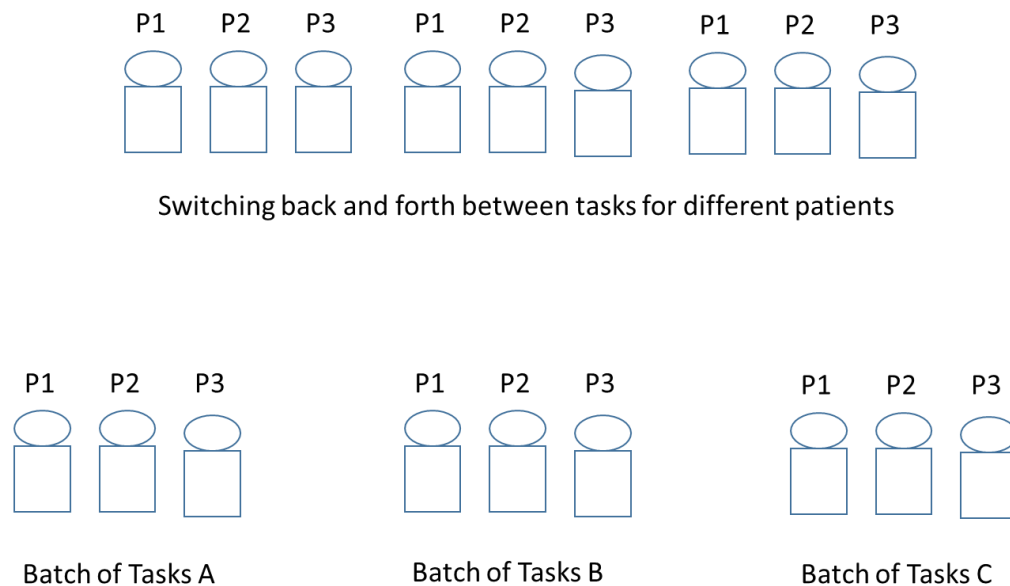
PATIENT SWITCHING AND BATCHING

Dr. Monroe felt that two factors accounted for some percentage of the loss of productivity in the ED: patient switching and batching. Patient switching occurred when everything that could be done for a patient was not completed before moving on to another patient or to another task. This happened when patient priorities changed, or interruptions occurred. For instance, a physician might be working with a patient when a more critical patient needing immediate attention came in. Then the staff must switch from one patient to another before all the tasks on the lower priority patient were completed. PCAs were often pulled in many directions, for instance, drawing blood on one patient then being asked by a nurse to do a test on another patient or having to leave the ED to transport a patient when a bed opened for admission or transporting a patient to radiology for a procedure (Westbrook et al., 2010).

Batching ("Emergency Department Flow," 2015) occurred when staff performed the same procedure on a series of patients—an assembly line approach to performing tasks. For example, physicians writing their discharge orders in batches at the end of their shift or labs doing testing only after a predetermined number of tests were ordered. Batching may be done because it felt more comfortable doing all of one type of task at a time before moving on to another task or because it

seemed more efficient. Figure 1 depicts the impact of switching and batching. In all instances, patients were being delayed while waiting for a batch to be completed to be seen by staff. While batching and patient switching seemed optimal for a specific department, the problem was that patients were kept in a holding pattern within the department.

FIGURE 1
Patient Switching and Batching



MISALIGNMENT WITH AND AMONG OUTSIDE UNITS

Coordination became more complicated when tasks were needed to be completed by departments outside the ED. When the patient was transferred to another department for a test such as a CT scan, then the patient was handed off from the ED to another outside department or handed off from one outside department to another outside department for a different test or procedure (Friesen, White & Byers, 2008; Hendrich & Nelson, 2005). Then there tended to be longer built-in wait times after such patient handoffs between departments.

Other problems with a patient handoff occurred when the outside department was ready for the patient, but the patient was not ready to be transported or no technician

was available to transport the patient. There were also times when a room was ready for an ED patient, but the ED was not informed or when lab results were ready, but no one followed up. At times, there seemed to be a complete misalignment among the outside departments and the ED.

Dr. Monroe observed that patients waited too long to get tests done, then ED staff waited to get the test results back in a timely fashion. He was concerned with the follow-through on testing by other departments, as well as the conflicting priorities of the ED staff. There were issues with scheduling patients for testing during trauma cases or for cases requiring a person with a certain skill level to perform a specific task. For example, a patient who had difficult veins for blood drawing might require a nurse or a phlebotomist instead of a PCA. There tended to be an increase in patient time in the system when the patient had to be sent out of the ED for testing. For example, Mr. McCartney in room 3, needed to have a CT exam done. Only large hospitals had a dedicated CT scan machine in the ED department, as these machines were very expensive but may be used only several times a day. So here, the CT scanning machine had its own department within the hospital. Normally it took time to work that patient into the schedule except in an emergency, when the ED patient will be moved to the front of the line. Still, there were lags in the CT machine use. Patients had to be brought to the machine. Then the room had to be cleaned between patients and supplies needed to be restocked.

At times, it seemed there was no mechanism to coordinate the activities of all the resources inside and outside the ED. Most of the charge nurses—the most senior and experienced nurses coordinating staffing and patient care—did a great job, but Dr. Monroe felt that too many people were just doing what they felt was critical for their department, not what was best for the patient's door-to-discharge time. He noticed that communication between departments was not necessarily very efficient. Was this just one of those days when nothing seemed to be going right, or was there a total breakdown in the system?

LOOKING FOR SOLUTIONS

Dr. Monroe and the entire ED, as well as all the other hospital departments, had been working on trying to improve the door-to-discharge time of patients. The ED had been remodeled to improve flow (Hwang, Lee & Shin, 2011). The rooms had enough space to care for two patients if needed, with a curtain divider between the patients. The ED had been talking with the other departments about having dedicated resources versus shared resources— such as patient transporters. Dr. Monroe and the nurses had reviewed the literature on what other EDs had tried or implemented but some of the strategies reported were not feasible.

Other improvements had been discussed and were in various stages of implementation. The administration had committed to expanding the critical care bed space in the next year since many admissions from the ED ended up in the critical care unit. The hospital had begun coordinating surgery times for both scheduled and unscheduled admissions to improve the patient flow for the ED as well as the whole hospital. People were trained in Lean techniques (Radnor, Holweg & Waring, 2012) and they had localized improvement in some departments, but the overall length of stay remained unchanged. One ED wall was covered with Post-it Notes with different value stream maps and dozens of indicators and measurements. With so many parts that potentially could be improved, there was not a mechanism to pick the most relevant projects.

One of the system quality indicators for the ED was the amount of time it took for a patient to go from arrival to either discharge or admission. At Valley Hospital, only 50% of the patients were discharged under the two-hour benchmark. The door to admission time benchmark was four hours. Only 55 % of Valley's patients were admitted within that time. Dr. Monroe and the ED improvement committee felt that these numbers were not acceptable and that there was a lot of room for improvement.

BACK IN THE ED

Dr. Monroe received a message from one of the nurses saying that Mr. McCartney's CT scan was finally back and that it needed his immediate attention. Thoughts about improving patient flow had to take a back seat as he needed to take care of his patients. On his way to room # 3, he was still musing about what needed to be done to make things better.

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