Open School

Case Study: Knowing Is Not Enough

(http://www.ihi.org/offerings/IHIOpenSchool/resources/Pages/CaseStudies/KnowingisNotEnough.aspx)

Paul Batalden, MD, Professor of Pediatrics and of Community & Family Medicine, Dartmouth Medical School

Learning Objectives

At the end of this activity, you will be able to:

- Describe how staffing shortages and inappropriate supervision can lead to adverse events.
- Discuss how poor communication among hospital staff can lead to adverse events.
- Identify contributing elements to a case resulting in the death of a patient.

Description

A healthy 57-year-old man underwent a liver donation procedure. He began to manifest some tachycardia late on the second postoperative day. Early on the third post-operative day, he began to hiccup, and complained of being nauseated; later that day he was pronounced dead.

Related IHI Open School Online Courses:

- PS 104: Root Cause and Systems Analysis
- PS 103: Teamwork and Communication
- PS 102: Human Factors and Safety

Key Topics

Handoffs, reliable processes, transitions in care, communication, adverse event, surgical infection prevention, surgical safety, infectious diseases.

On January 10, a healthy 57-year-old man underwent a liver donation procedure that successfully resected approximately 60 percent of the right lobe of his liver in preparation for transplanting that liver into his brother, a 54-year-old man who suffered from a degenerative liver disease.
After what was described as a technically uneventful transplant, the donor patient seemed to do well on the first postoperative day. Late on the second postoperative day, he began to manifest some tachycardia. Early on the third post-operative day, he began to hiccups and complained of being nauseated. He was given symptomatic treatment. Later that day, he began to vomit brownish material. He became oxygen-desaturated and was placed on 100% oxygen by mask. He continued to vomit, aspirated, and suffered a cardiac arrest, from which he was not resuscitated; he was pronounced dead on the third post-operative day.

At autopsy, he was found to have aspirated bloody vomit in his lungs and Clostridium perfringens growing in several abdominal sites.

Three months later, the state health commissioner issued a 10-page report of an inquiry into the circumstances surrounding the patient’s death, offering the following reconstruction of the sequence of events:

- **January 10**—Patient undergoes surgery to remove the right lobe of his liver. No complications occur during the procedure.
- **January 11**—Patient is recovering; his condition is stable.
- **January 12**—Patient is “examined” during rounds by first-year transplant fellow and PGY 4 surgical resident. Transplant fellow neither looks at, nor asks for patient’s vital signs. At 4 pm, patient develops tachycardia.
- **January 13**—
  - Approximately 1am, patient develops hiccups and nausea. Patient is given medication to control symptoms, which may have masked the underlying problem.
  - At 8:45am, patient is examined by PGY 4 surgical resident who is unaware of the patient’s continuing tachycardia and nausea and previous hiccups and writes a progress note indicating vital signs are stable.
  - 1:10 pm patient vomits brownish materials, tachycardia persists. PGY 1 surgical resident calls transplant fellow who is in a bookstore outside the hospital. He advises against insertion of a nasogastric tube. Upon returning to the hospital, and despite the patient’s distress, he does not examine him, but instead prepares a pre-operative work-up on another patient scheduled for surgery the next day.
  - 2:00pm patient’s oxygen saturation is unacceptably low; 100% oxygen is administered by mask.
  - 3:00pm nurse calls PGY 1 resident to inform her that the patient is continuing to vomit and has difficulty breathing.
  - 3:10pm patient becomes unconscious after vomiting more brownish materials and frank blood. Code is called; resuscitation measures are unsuccessful.
  - 3:40pm patient is pronounced dead.
Autopsy revealed large amounts of vomited blood in the patient’s lungs, the presence of *Clostridium perfringens* infection in the patient’s portal vein, esophagus, stomach, small intestine, and lung. A separate investigation into the infection is underway.

1. **Pretend you are the state health commissioner. Would you conclude that the patient received appropriate care? Why or why not?**

The report concluded that the patient’s post-operative care was fragmented at best, and entrusted to individuals who, although qualified, were unable to provide the level of attention necessary for his total post-operative care. According to the commissioner, “The hospital allowed this patient to undergo a major, high-risk procedure and then left his postoperative care in the hands of an overburdened, mostly junior staff, without appropriate supervision. Supervision of medical residents was far too lax, resulting in woefully inadequate post-surgical care.”

More detailed findings included:

- Patient was neither carefully monitored nor appropriately examined and evaluated post-surgery. Caregivers, including nursing staff and a fourth-year surgical resident failed to promptly identify abnormal vital signs that would have allowed them to respond appropriately when the patient developed tachycardia and hiccups 48 hours post-op.

- Significant changes in the patient’s condition were not communicated to all those responsible for his care.

- During the weekend in question, the hospital’s transplantation institute was inadequately staffed with nurses and physicians in charge of providing the necessary care for 34 transplant recipients and donors.

- A first-year surgical resident (PGY-1) was left alone for three hours on January 13 (the day of the patient’s death) to care for all 34 patients. She described herself as feeling “overwhelmed” by the responsibility of caring for so many patients with only nurses to help her. She had been a surgical resident for five months and had started on the transplant service 12 days before January 13.

- A first-year transplant fellow on pager out of the hospital failed to respond immediately when informed by the PGY-1 of a significant change in the patient’s condition.

- The operating surgeon never saw the patient post-operatively.

The hospital chief operating officer said that the state’s report was accurate.

As a result of the investigation, the health department cited a total of 18 deficiencies against the medical center under the categories of Governing Body, Medical Staff, Nursing Services, Patients’ Rights, Medical Records, Surgical Services and Critical Care and Special Care Services. Regulations
require the hospital to propose a specific corrective action for every deficiency cited, explaining in
detail how each is to be addressed.

2. Pretend you work for the hospital. How would plan to address each of
the issues in the bulleted list above?

The department suspended adult living liver transplantation procedures for at least six months while
they sought solutions to the problems identified in the report. This was the first death to occur in a
living donor in the program with 170 living liver transplantation/donation procedures having been
done in the last 9 years.

A national expert indicated that there was no registry of patients who receive live donor liver
transplants, so he was unable to comment about the frequency of this type of complication, but
thought it was rare. The death of a live donor represents the worst-case scenario envisioned by ethics
experts.

In what may be an unrelated event, the former health department chief for the same state took great
pride approximately 13 years earlier in the passage of a law which limited the amount of time any
given resident doctor could work on duty in any week to 80 hours.

This surgery residency has a total of 72 residents and enjoys full accreditation. Approximately 25
percent of their resident staff come from international medical schools.

In the lay press, this hospital has been described as one of the “nation’s best” for many services. The
hospital is in the “top 50” US hospitals for several conditions. In the months preceding this incident,
the hospital had been working on a general priority of “trimming costs” as part of their efforts to meet
operating targets.

Discussion Questions

1. What role, if any, do you think trimming costs and limiting resident duty hours
   played in the outcome for this patient? Can you think of an example in your own
   experience when “trimming costs” and/or staff shortages resulted in a minor or
   major problem or adverse event?

2. What are your general reactions to the Case Study? For example, the narrative says,
   “The death of a live donor represents the worst-case scenario envisioned by ethics
   experts.” What does this mean to you, and do you agree?

3. Imagine you were the first-year resident left alone for three hours on the day of the
   patient’s death. What thoughts would be going through your head? Is there anything
   you would have done differently?

4. If you were the CEO of the hospital, what would you have said to the family of the
   deceased man? Would you have apologized? What words would you have used?