

## Patient safety

# Taking steps to protect patients from specimen-handling errors

*An OR specimen was transported to the laboratory. The lab called to say there was no specimen in the container. The specimen was a completely excised ovarian mass.*

*A patient had two specimens excised from her breast. The specimens were sent to radiology for x-ray. The lab reported that only one specimen was received. Unable to locate the other specimen.*

**T**hese incidents, reported by the Pennsylvania Patient Safety Authority, are examples of what can go wrong in specimen handling. Specimen errors have huge implications for patient safety because they can mean a missed diagnosis or delayed treatment. Managing specimens in the OR involves multiple steps and handoffs that are vulnerable to errors. Staff education is critical because of the many types of specimens and preparations required.

How common is the problem?

Little has been published on the incidence of specimen errors. A study of specimen identification errors at The Johns Hopkins Hospital found the rate was low. Examining errors in 21,351 specimens from all patients who had inpatient or outpatient surgery over 6 months, the researchers led by Martin Makary, MD, MPH, found the error rate was 4.3 per 1,000 surgical specimens. The rate was 0.5% for the outpatient setting and 0.4% for the OR. Errors were most common in breast procedures, followed by skin and colon surgery. The majority of errors (59%) were associated with a biopsy. All incidents were resolved without patient harm.

### Specimens included in briefings

One strategy for reducing the risk of errors is to include specimens in OR briefings and debriefings. Johns Hopkins includes specimens in its OR debriefings, Dr Makary noted. The debriefing includes the question, "Has the surgical specimen been verified?"

The World Health Organization (WHO) includes specimen-labeling verification in its model surgical safety checklist introduced in June 2008. Specimen labeling must be checked during the "sign out" before the patient leaves the OR. (See August 2008 *OR Manager*.)

The Joint Commission's National Patient Safety Goal 1 addresses specimen handling, saying 2 patient identifiers are required when collecting blood samples and other specimens.

### Creating safeguards

To improve the process, the Pennsylvania Patient Safety Authority in a 2005 advisory on lost specimens recommends shifting from a focus on individual performance to a systems approach with built-in safeguards. The advisory is free for download at [www.psa.state.pa.us/psa](http://www.psa.state.pa.us/psa).

Among steps recommended:

- flowcharting the process and interviewing staff members about what actually occurs during specimen handoffs
- placing specimens in sterile containers and labeling them immediately after they are handed from the sterile field



- reducing reliance on memory with checklists, requisition forms, and charts with proper handling procedures
- using “forcing functions” such as bar coding, read back of patient identification and specimen type, and handoff protocols for specimen transfer
- developing a chain of custody to track specimens from collection through transfers to their final disposition
- standardizing language and tasks
- incorporating quality monitoring, for example, by reviewing documentation, double-checking that specimen logs agree with the specimens received in pathology, and investigating discrepancies
- configuring the physical environment where specimens are stored to reduce errors.

### **Building a stronger process**

Swedish Medical Center, a 3-hospital system based in Seattle, has strengthened its specimen handling process in several ways. Its specimen handling policy was revised recently after a lost specimen. The OR also participated in a pathology department rapid-process improvement project (RPI) at the flagship First Hill campus (related article). As an added level of safety, specimen documentation is being added to Swedish’s new Epic perioperative information system.

### **Updated policy has safeguards**

Swedish’s revised policy builds in a number of safeguards. Coincidentally, Renae Battié, RN, MN, CNOR, the recently hired director of intraoperative services who took the lead on the revision, also served on the AORN Recommended Practices Committee during the 2006 revision of the specimen handling recommended practice.

Safer handoffs are one aspect of Swedish’s new policy:

- The scrub person verifies the specimen by confirming with the surgeon the name of the specimen, inquiring which tests are to be performed, and checking with the surgeon before passing the specimen to the circulating nurse.
- The circulating nurse, when handed the specimen by the scrub person, reads back the patient’s name, name of the specimen, and test to be performed.
- The circulating nurse documents the name of the specimen, tests to be run, the destination, and name of the transporter in the perioperative record.
- At the end of the case, the surgeon verifies how many specimens were taken and received by the nurse.

The policy states that all material removed from the patient’s body must be sent to the pathology lab, except for a specific list of items that can be discarded. The policy also spells out how to handle special types of specimens such as amputated limbs, culture samples, cytology specimens, tissue for chromosomal analysis, and explants requested by the patient or surgeon.

(The College of American Pathologists has a policy on specimens to be submitted to pathology. [www.cap.org](http://www.cap.org).)

As Swedish implements Epic for the ORs, the software will include specimen documentation and order forms, Battié notes. That will add a layer of safety because the nurse must complete certain fields for the order forms to print. Epic will automatically assign an order number for tracking.

### **Chain of custody**

Having a chain of custody for specimens is recommended by both AORN and the Pennsylvania Patient Safety Authority. If a specimen is missing, a chain of custody provides a way to track back to see where the error occurred.

Christiana Care, a 2-hospital system based in Wilmington, Delaware, took steps to improve its chain of custody 3 years ago after several specimens were lost. Thomas Zeidman, RN, BSN, CNOR, made that one of his first projects after becoming manager of surgical services for one of the 2 main OR departments at Wilmington Hospital. Since the new system was introduced, there has been only 1 specimen that could not be accounted for, and an additional step has helped to close that loophole, he notes.

Under the old process, the OR nursing staff filled out a specimen request form and

placed the specimen in the refrigerator, where the pathology staff picked it up. But there was no handoff or tracking mechanism.

Zeidman developed a new 2-part form that collects more information: the type of specimen; a code for where the specimen is taken (OR refrigerator, to the lab by courier) and spaces for initials of the person receiving the specimen; signature of the OR nurse, and signature of the surgeon verifying that the specimens listed on the form are the ones taken from the patient.

### **New chain of custody process**

This is the chain of custody process:

- The circulating nurse places one copy of the form in the patient's chart. The circulator places the specimen in the OR refrigerator and puts the specimen form in a binder near the refrigerator.
- The pathology staff member who picks up the specimens looks in the binder to see what new forms have been added, initials the forms, and takes the specimens. If a form is in the binder but no matching specimen is in the refrigerator, the lab staff member calls the OR charge nurse so the specimen can be tracked down immediately.
- When a courier takes a specimen to the lab, the courier gets a sticker from the pathology lab signed by the staff member who received the specimen. The courier brings the sticker back to the OR and places it on the specimen form in the OR binder.

"This way, we have a record of everyone along the chain who had custody of the specimen," Zeidman notes. "The system seems to work well. I think we have closed the loopholes as best we can."

### **Staff education**

The variety of specimen types and the special handling methods make staff education challenging. Common methods are regular in-services and laminated charts listing specimen types and preparation requirements.

Perhaps the best patient safety measure is open communication between the OR staff and pathology lab staff, says Matthew A. Zarka, MD, director of cytopathology in the Department of Pathology and Laboratory Medicine at the Mayo Clinic in Scottsdale, Arizona.

"We stress to the OR staff that if there is any question, it is better to call us," he says. "No one should be embarrassed or nervous about asking how a specimen should be handled." ❖

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## **References**

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## ***A clean, orderly specimen area***

As part of Swedish Medical Center's improvement project, lead by the pathology department, the OR staff reorganized areas where specimens are placed for pathology pickup. Carrie Stout, RN, BSN, was the OR's representative on the project. The project used Lean, a quality improvement method based on the Toyota Production System that Swedish has adopted.

In cleaning up the work areas, the OR used a Lean method called 5S. The S's stand for 5 Japanese words that apply to a clean, orderly workplace. The 5S's applied to the OR work areas are:

### **Sort**

Decide what is necessary and what isn't necessary in the work area.

### **Straighten**

Make it clear where items need to go. Make sure items are labeled, and it's clear what should happen to them.

### **Standardize**

Standardize the process and terminology so these are clear to the surgical and pathology staffs and to the couriers.

### **Sweep**

Clean the area. Remove equipment that is no longer used.

### **Sustain**

Make sure the area is kept orderly, and the process is followed consistently.

Standardizing was important, says Stout, because the hospital has 4 surgical sites: an eye center, an orthopedic center, the main OR, and a same-day-surgery area. All sites now use the same A, B, C, D system to identify the order of specimens obtained from the patient. Specimens are placed in bins labeled so the newest ones are at the top. The pathology staff then knows in what order the specimens should be processed.

"One key thing we did was to put up clear, laminated instructions in each area," she says.

At first, Stout says she wondered how relevant the pathology RPI would be to the OR. But she found the project enlightening.

"As OR nurses, we tend to be unit centered," she says. "Understanding the courier process and what happens to the specimen when it gets to pathology was eye-opening. You see what information they need. I was glad to see another department I worked closely with so I could better understand the process."



The Swedish specimen handling policy is in the OR Manager Toolbox at [www.ormanager.com](http://www.ormanager.com).

