Examining the Consequences of Rejected Specimens

Findings underscore unsafe practices regarding relabeled samples

By Genna Rollins

Specimen rejection is an important quality metric followed by many clinical labs that can have serious consequences for patient care. Researchers at George Washington University sought to explore more specifically how rejected specimens impact patients as well as the care process. Their findings are the subject of this issue of Strategies.

Labs reject specimens for a variety of reasons, including inaccurate or inappropriate labeling, and poor specimen quality or quantity. Many labs include specimen rejection as a quality metric, and prior research has shown that about 1% of specimens in clinical chemistry and hematology labs are rejected.

Laboratorians generally recognize that rejected specimens result in inconvenience and even harm to patients, as well as introduce inefficiencies into the care process, such as longer turnaround times and delayed diagnoses. However, researchers at George Washington University in Washington, D.C. wanted to draw a more complete picture of the clinical consequences of rejected specimens. To do so, they conducted a College of American Pathologists’ Q-Probe analysis of 78 participating institutions in the United States, Saudi Arabia, Canada, Jordan, and Spain (Arch Pathol Lab Med 2014;138:1003–8).

“Specimen rejection is a significant issue in terms of delay of care and of patient safety,” explained the study’s lead author, Donald Karcher, MD, professor and chair of pathology at the George Washington University School of Medicine and Health Sciences. “Specimen rejection is important because it certainly wastes resources, and results in patient discomfort and potential patient complications. It also interferes with effective care because of the delay in results and it may ultimately introduce patient harm or a risk of patient harm, because of use of data from totally mislabeled specimens.”
Participants prospectively reviewed blood and urine specimens submitted to either the central chemistry or hematology lab sections until each identified 80 rejected specimens or 6 weeks had passed, whichever came first. Samples under consideration included only those from hospitalized or emergency department patients who were at least 6 months old, and for tests conducted onsite.

The researchers considered five performance indicators, including: specimen rejection rate; median processing delay; percentage of lab-abandoned specimens; percentage of provider-abandoned specimens; and percentage of relabeled specimens subsequently determined not to be from the intended patient. The overall specimen rejection rate was 0.2%, or 4,794 rejected specimens out of a total of 2,054,702 acquired.

In analyzing the consequences of these rejected specimens, the authors made several concerning findings. First, 86.8% of rejected blood specimens led to repeat phlebotomy, while 13.8% of rejected urine specimens had to be recollected by recatheterizing patients. Karcher expressed concern about both statistics. Aside from inconveniencing and discomforting patients, he explained, repeated blood draws can, on the extreme end, lead to iatrogenic blood loss requiring transfusion. But the number of rejected urine samples that required recatheterization also caught his eye. “We found that number was a little bit higher that we thought it would be. Repeated recatheterization is clearly associated with potential complications and potential discomfort on the part of patients.”

The authors also documented delays in processing specimens—a median of 54 minutes for stat specimens, 88 minutes for non-stat specimens, and a median of 65 minutes overall. They counted the delay as starting when a specimen was identified as being rejected and ending at the time a recollected or relabeled specimen was received. “That’s a pretty significant finding; having stat results delayed for about an hour is substantial, particularly if there are critical values,” said Karcher. “We didn’t make any attempt to determine which ones ended up with critical versus non-critical. The assumption was that when these were ordered stat, they may have been critical results or critical tests.”

While the vast majority of samples were rejected due to inappropriate or inadequate specimens, 7.6% were not accepted because of improper labeling. This finding, and participants’ practices involving mislabeled specimens, troubled not only the authors but also Michael Astion, MD, PhD, who was not involved in the study. In a survey conducted as part of the study, 45% of respondents indicated that they allow improperly labeled blood specimens to be relabeled, including 85% when the specimen is incompletely labeled, 59% when it is mislabeled, and 36% when it is unlabeled.

“Mislabeling was actually very uncommon. That was a bit of good news,” noted Karcher. “We had a small N, only 51 specimens out of a very large study. There were only very few laboratories that actually documented those events.”

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A less positive finding came upon further examination of the 51 initially mislabeled specimens that were subsequently relabeled. Participants ultimately discovered that 39% of these relabeled specimens were not from the intended patient, meaning the wrong specimen was in the container. “This was kind of a shocker for us,” said Karcher. “Even though we had small Ns in terms of the number of labs and number of specimens, this makes a strong recommendation to not allow any mislabeled samples to be relabeled.”

Aston, who is medical director of laboratories at Seattle Children’s Hospital and editor of Clinical Laboratory News’ Patient Safety Focus, was equally troubled by this finding. “It is appalling that so many of the relabeled specimens were mislabeled,” he said. “When a lab relabels a specimen, it pleases clients, but it is not safe. People don’t want to have that critical conversation about recollecting a specimen because it is very uncomfortable.”

Many factors come into play in the dialogue around recollecting versus relabeling specimens, according to Aston. “The reason labs do not want to do it is that it is hard, and it takes backbone. There is a balance that labs try to strike between patient safety, physician satisfaction, lab worker satisfaction, and fiscal responsibility,” he explained.

He added that doctors and nurses also get trapped by the “tyranny of small numbers,” so that any individual one of them most likely will only deal with a mislabeled specimen a few times in his or her career, and may never experience a patient being harmed as a result of the mislabeling. However, this small event rate factored over a large number of tests run over the course of a year makes it incumbent on labs to reject mislabeled samples, and cause some inconvenience and suffering to patients in the near term to avoid a major safety event like a wrong organ transplant or misdiagnosis.

Both Aston and Karcher recommended that labs use the study findings to scrutinize their specimen rejection rates and tighten their specimen rejection procedures.