

Error Reduction in the Histology Lab

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Tech Points

It's an all too common scenario in the histology lab: the pathologist comes storming in and says "This slide is tonsil and the paperwork says it's supposed to be endometrium!!" Panic ensues, and every tech within earshot sends up a silent prayer: "Please don't let that be one I cut!". After the mix-up has been resolved, the proper report recorded, and someone thunked on the head for the mistake, we're all just thankful that it was a mistake that got caught. What if it had been two endometriums, one had been malignant, and the mix-up wasn't obvious to the pathologist? We could have harmed the patient. And THAT is what strikes real terror into the hearts of every tech in the land.

Histotechs tend to be a very conscientious lot. No one sets out to make mistakes. But in the complex, busy labs we work in, the human factor exists, and mistakes can happen despite our best intentions. We need to recognize our humanity, but also address the causes of these errors so that we can reduce the problem as much as possible, prevent harm, and be proud of the work we do.

Scope of the Problem

Studies have shown that medical errors cause almost 98,000 deaths a year, and cost over \$29 billion annually, but that is only the tip of the iceberg. The number of medical errors causing "Adverse Events" (an untoward outcome including patient harm or a significant change in the way a patient was treated) is many times that amount. A mere 0.7% of this is due to errors in anatomic pathology, with a majority of the published studies focusing on diagnostic interpretation errors. Although that is a low number, any error is significant in that pathology errors can alter the treatment (or lack of treatment) for patients.

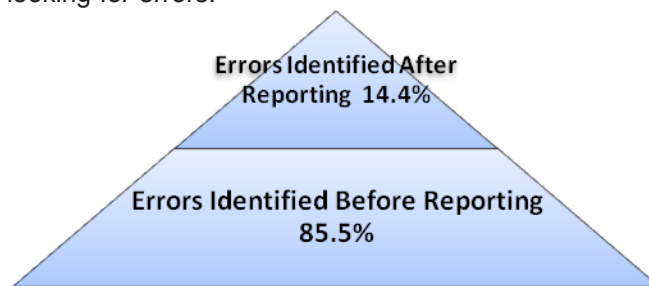
In 1999 the Institute of Medicine issued a report on medical errors titled: *To Err is Human, Building a Safer Health System*, which emphasized the need to prevent, identify, track, evaluate and report medical errors. Since then, agencies such as the Joint Commission (JC), formerly the Joint Commission on the Accreditation of Health Care Organizations (JCAHO), have adapted requirements for reporting, tabulating, and addressing errors in the medical community. The 2009 Patient Safety Goals are:

- Improve the accuracy of patient identification
- Improve the effectiveness of communication among caregivers
- Reduce the risk of health care-associated infections
- Encourage patient's active involvement in their own care as a patient safety strategy

All of our hospitals have responded to this and developed programs to evaluate errors. Most commonly, the hospital-wide programs address direct nursing and patient care concerns, and have little application to laboratory operations. The College of American Pathologists (CAP) has included laboratory error evaluation requirements in their accreditation programs. Still, most laboratory error prevention programs are more applicable to the clinical laboratory simply because anatomic pathology is harder to study.

The Nature of Errors

Misidentification of specimen, block or slide has been shown to be the most commonly occurring error in the laboratory, including surgical pathology. In a study of 417 surgical pathology labs, errors related to specimen identification were found in 0.57% of cases. Identification errors are difficult to study systematically, since many of them go undetected. The number of errors a particular institution reports is often dependent on how hard the institution looks for errors. Therefore the lab which reports the lowest error rate may simply be the lab which does the poorest job of looking for errors.



Because of this, it is important to review the number of errors a laboratory detects before release, and compare that with the number reported after release. A recent study of 120 laboratories showed an overall average of 85.5% of errors were detected before release, but that institutions with higher pre-release error rates had lower post-release error rates. A diligent error detection program will significantly reduce the number of errors which are released and the potential for Adverse Events and patient harm.

Laboratory errors can be divided into three categories: Pre-analytical, Analytical and Post-analytical. A well-designed laboratory error detection program should review errors in all three categories.

Pre-analytical errors involve initial patient and specimen identification, and specimen collection and handling (includ-

ing fixative choice) prior to reaching the laboratory. These errors account for a large percentage of the errors that leave the laboratory, and therefore require diligent study and evaluation.

Analytical errors in pathology include improper grossing, improper fixation and processing, mislabeled blocks and slides, incorrectly sectioned or stained tissue, and incorrect control tissue used. Histology has the most control over these issues, and therefore has a great responsibility to evaluate and reduce the analytical errors in the surgical pathology department. The misdiagnosis done by pathologists is also an analytical error. (In some labs, grossing, processing and sectioning are considered pre-analytical.)

Post-analytical errors are outcome driven and include problems with typing of reports, receipt of reports by clinicians, misfiling of slides or blocks for later retrieval, and problems with communication between pathology and clinicians.

Tracking and Error Reduction

Recording, tracking and analyzing internal errors can lead to system improvements that can not only provide safer health care for patients, but can also reduce the workload, stress level, and supply costs in your lab. "Medical errors" are generally considered the errors that could harm a patient. Unfortunately, in our laboratories, there are many other errors that – although they can't harm a patient, cause us a lot of chaos, time and money. Consider the IHC stain where the CK20 antibody was inadvertently used instead of the requested CD20 and repeat testing was required, or the silver stain performed with outdated reagents which stains poorly and must be repeated, or the misplaced slides on a case that you spend hours tracking down.

The purpose of any error reduction program should be to identify underlying causes for errors so that process improvements can be made. Staff should be encouraged to document errors so processes can be improved. There is an understandable resistance to this. No one likes to admit when they were wrong, and many people are concerned about retaliation when reporting errors. It is important to adapt a "no shame, no blame" approach to the collection of error information, and communicate that to the staff. To collect the type of data that will be useful in process improvement, a uniform format must be implemented. A form with checkboxes can be simplest for staff to complete, and also easiest to tabulate. An online reporting system can provide automatic tabulation of the findings.


After tracking and tabulating the errors, your laboratory's QA program should have an effective method for addressing error reduction. Root cause analysis is a tool that has been used effectively for this purpose. Also, the LEAN process, when used properly, can assist with error identifica-

tion and reduction.

In the Michigan histology laboratories reviewed, most labs did not have tracking systems for all of the major error types, and most reporting systems appeared very capricious. One lab's error statistics reported only errors in computer data entry. One lab's QA reports showed only slide labeling errors discovered by Dr. Squeekywheel. To be effective, a system must be implemented which accurately tabulates all error types in a uniform manner. Also, of those reviewed, most Michigan histology labs that tracked errors at all still had no program in place to analyze and address the errors that were found.

Of the histology laboratories that reported successful error reduction interactions, the following success stories were noted:

- Errors caused by difficult-to-read handwriting on blocks and cassettes were reduced by investing in slide and block labeling printing systems
- Mislabeled/mismatched slides and blocks were reduced by use of bar coding systems
- Histology departments reduced errors caused by chaos and distractions by providing adequate staffing and implementing 'quiet zones' in critical areas
- Eliminating portable media players and reducing radio noise increased staff communication and encouraged appropriate cross-checking and questioning

Most errors are systemic in nature, not the fault of individuals. If we identify causes, then we can fix systems. Errors can be prevented by designing systems which make it difficult for people to do the wrong thing, and easy for them to do the right thing. By not addressing system issues, we set people up to fail. Often we identify symptoms and attempt to compensate or change procedures without actually finding out the real problem. Most errors are preventable if we can identify the source. The key is to create systems that make it difficult, if not impossible, to fail. 

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