# TACLS News

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Investigating Lab-Related Adverse Events: Classifying Errors to Determine Effective Interventions

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When laboratories conduct meaningful investigations of adverse events, each adverse event should be classified according to patient outcome and error type. Investigating outcomes is essential because quality improvement must focus on errors associated with poor patient outcomes. Error classification is important because it guides the choice of interventions. Errors should be evaluated for preventability, since QI efforts are directed at errors that are (reasonably) preventable. In addition, errors should be classified as cognitive, non-cognitive, or both.

Cognitive errors, also known as mistakes, are due to lack of knowledge or poor judgment. Poor judgment also encompasses purposeful disregard of policies and procedures. Examples of cognitive errors include:
•Failure to properly interpret a common instrument flag
•Mistaking yeasts for host cells on a Gram stain
•Calling in a critical value to a voice mailbox, despite knowing that the policy is that the patient
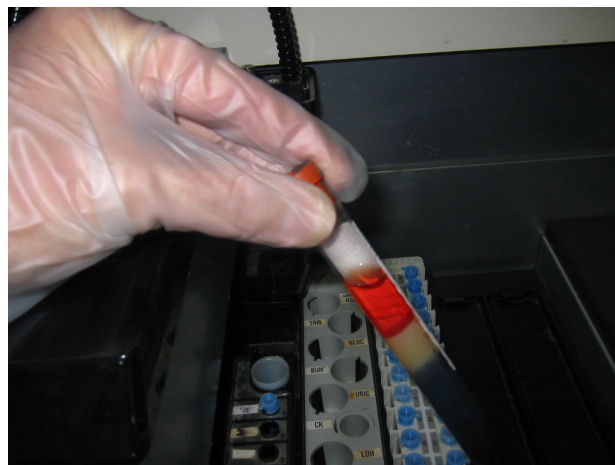
care provider must accept the value directly

Cognitive errors are usually overcome by training or supervision. For example, a laboratory might establish a policy that rare peripheral blood smear results must first be reviewed by a supervisor or medical director before being reported. This would help overcome the cognitive errors associated with rare test results. Non-cognitive errors, also known as slips, are due to disruptions in processes that are relatively automatic. Examples of errors that are usually classified as non-cognitive include:
•Failure to enter information from a requisition into the lab information system
•Data entry errors
•Mislabeling
•Math errors

Non-cognitive errors are reduced by strategies for avoiding lapses in concentration that result

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from high work volume and inefficient procedures. These strategies include:
•Automation
•Checklists
•Reducing phone calls and interruptions
•Simplifying procedures
•Improving staffing
For example, interfacing instruments directly to the laboratory information system is a good way to reduce post analytic data entry errors.

To correctly classify an error, it is necessary to consider the experience of the employee. An error might be considered cognitive for an inexperienced employee but non-cognitive for an experienced employee. For example, consider the failure to draw the correct type of blood tube for a common test. This would nearly always be classed as a non-cognitive error for an experienced phlebotomist. However, for a new employee, this would often be a non-cognitive error. The intervention for the new employee would involve additional training, and perhaps additional supervision, but these interventions are probably useless for the experienced phlebotomist.

The most common management blunder regarding errors is to prescribe supervision and training for non-cognitive errors. Examples include suggesting additional training for an experienced specimen processor who committed a data entry error at specimen login, or for an experienced technologist who made a math error. Training will usually not lead to sustained improvement in these cases. It would be better to improve error checking, reduce interruptions, simplify procedures, and optimize work volume. For example, increasing the font size and simplifying requisition forms could reduce login errors. This approach should help labs determine error types and improve interventions.

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This is the fourth in a series of articles by Dr. Astion about reducing laboratory errors. The next article will appear in the April issue of the TACLS News. Return next month for Part V: *Creating a Culture of Patient Safety in the Lab.*

Focus on Laboratory Professionals

Dave Falleur

Tiffany Flowers, Toxicology Chemist
Tiffany Flowers graduated from Texas State University (formerly Southwest Texas State University) in 1993. She worked for ten years as a staff technologist at Central Texas Medical Center. Tiffany enjoyed working in the clinical chemistry department but was looking for something more challenging. In the Fall of 1999

she was accepted into the graduate program in toxicology of the Department of Clinical Laboratory Sciences at the University of Texas Health Science Center in San Antonio. The toxicology program was very demanding with a lot of heavy duty chemistry and an internship at the Bexar County Medical Examiner's Office Toxicology Laboratory in San Antonio. The Toxicology Laboratory staff helped her with her graduate thesis which was a study of GHB and methods to detect and quantify it in postmortem specimens. Tiffany presented her research findings at the TACLS Conference in Austin in March, 2003. After graduating in May 2003, Tiffany applied for a position at the Toxicology Lab and is now part of a team of six toxicology chemists, one lab assistant and a Chief Toxicologist. The Bexar County Crime Lab and the Bexar County Medical Examiner's Office is one of the busiest forensic centers in the state, and has already performed 300 autopsies in the first six weeks of the year. The toxicology lab uses gas chromatography and mass spectrometry


instrumentation for identification of suspect chemicals and drugs, cooximetry for carbon monoxide poisoning, and the TDX/FLX for screening certain drugs of abuse. Tiffany has been asked to serve as Quality Assurance Officer to help further develop the quality assurance plan for the lab. Unlike clinical laboratories, crime labs are not as well established with QA and QC

processes, so Tiffany has a challenging responsibility. This month the lab will be surveyed by the American Board of Forensic Toxicology. The lab offers many continuing education opportunities at regional and national meetings such as the Southwestern Association of Toxicologists. This Spring Tiffany will travel to Atlanta for training on the Agilent mass spectrometer. Although the workload is heavy, her supervisor allows Tiffany to use her flex time. Many toxicology chemists have masters degrees. If you are interested in more information about the graduate program in toxicology at UTHSC-SA, contact the coordinator of the Graduate Toxicology Program, Dr. George Kudolo, kudolo@uthscsa.edu.

Mark your calendar now

TACLS Annual Meeting, Houston, April 1-3
National Medical Laboratory Week, April 18-24
ASCLS/AACC Annual Meeting, Los Angeles, July 27-31
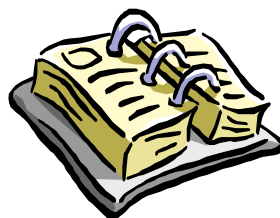
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