

# Patient Safety and the Medical Laboratory

## An Introduction

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### LEARNING OBJECTIVES

1. Define the six Institute of Medicine aims to improve the quality of the healthcare delivery system.
2. Classify and provide an example of each type of error.

**ABBREVIATIONS:** FN, false negative; FP, false positive; IOM, Institute of Medicine

**INDEX TERMS:** Quality Improvement; Healthcare Quality Assurance

**GLOSSARY:** Error, “failure to complete a planned action as intended (error of execution) or the use of a wrong plan to achieve an aim (error of planning)”;<sup>2</sup> Lapse, omission of automatic action; Healthcare quality, “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”;<sup>3</sup> Patient safety, “freedom from accidental injury: avoidance, prevention, and amelioration of adverse outcomes or injuries stemming from the process of care”;<sup>2</sup> Slip, wrong automatic action.

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Patient safety principles are valuable tools to improve the quality of medical laboratory services. Significant numbers of healthcare decisions are based upon medical laboratory test information,<sup>1</sup> which means that

improvements in laboratory testing services impact many healthcare delivery processes. Medical laboratory science professionals must assume this important responsibility of improving their contributions to healthcare delivery.

Patient safety is defined as “freedom from accidental injury: avoidance, prevention, and amelioration of adverse outcomes or injuries stemming from the process of care.”<sup>2</sup> No system or healthcare delivery process is immune to errors that may result in injury to patients receiving care. Some processes are inherently more risky, such as surgery; however, due to the complexity of delivering medical care, each interaction with a patient affects subsequent processes.

Healthcare, more than any other system, has vast opportunities for errors to occur. Many individuals are involved in one patient’s care, requiring multiple steps and interactions with multiple providers, seen and unseen. Technology is critical to delivering healthcare, encompassing its multiple information systems to its sophisticated robotic surgery suites, each requiring numerous and varied interactions by healthcare practitioners. Acuity of illness and injury varies depending upon the delivery setting, with hospitals treating the greatest diversity. Much of healthcare delivery is performed under time restrictions, requiring rapid decisions impacting subsequent steps in the care process. Patient flow is unpredictable in many aspects of the delivery system. Lastly, healthcare delivery is prone to distraction, requiring practitioners to manage multiple processes for many patients at the same time.

No matter where it is delivered, patients expect and deserve to receive care that meets the Institute of Medicine (IOM) definition of quality healthcare, “the degree to which health services for individuals and

populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”<sup>3</sup> Combining the IOM definitions of patient safety and healthcare quality, the aim of laboratory test information is to improve patients’ lives, not just to ensure that no errors occur during the total testing process.<sup>4</sup>

Errors occur due to a failure in execution of a process or an error in planning.<sup>2</sup> Errors of execution occur when interferences transpire while performing frequently performed processes. Interruptions, employee fatigue, time pressures, and emotional states of anger, anxiety, or fear are common interferences to accurate process performance. When interferences are present there is a greater chance to perform the wrong action, called a slip or to omit a step in the process, called a lapse. Examples of slips include entering the wrong value into the laboratory information system during manual entry of test results and pipetting a reagent twice into a test tube. Examples of lapses include failing to verify two patient identifiers when collecting specimens and failing to review the results of quality control. Errors in planning occur during processes requiring problem-solving. Problem-solving requires conscious effort to recognize a problem, comprehend factors involved in the situation and devise solutions. Errors in planning are a result of misinterpreting the problem, a failure to recognize that there is a problem, or a lack of knowledge or technical expertise.

Errors can be classified as diagnostic, treatment, preventive or other types of errors. The result of diagnostic errors is false positive (FP) or false negative (FN), such as identifying a disease that is not present (FP), failing to identify a disease that is present (FN), delaying diagnosis (FN), failing to order appropriate diagnostic procedures (FN), or failing to act on test results (FN or FP). Errors in treatment occur as a result of an error in performing a process, such as an inaccurate specimen analysis, misinterpretation of a laboratory test result, a delay performing a laboratory test or a delay in action by a clinician after receiving the laboratory test result. Prevention errors occur when there is a failure to provide appropriate measures such as cancer screening tests or immunizations. Other types of

errors include a failure of communication and equipment failure.

Errors that impact medical laboratory services include underuse, overuse and misuse of laboratory test ordering. Failing to order a necessary medical laboratory test for a clinical condition is an error of omission, which may result in a false negative diagnosis. Unnecessary ordering of a medical laboratory test is an error of commission, which may result in a false positive diagnosis. Misuse of laboratory testing is caused by ordering the wrong laboratory test for a patient’s condition, which may result in either a false positive or false negative diagnosis.

The IOM recommends each healthcare organization adopt these aims to improve quality: all healthcare should be safe, effective, patient-centered, timely, efficient and equitable.<sup>3</sup> Laboratory testing services should provide care that avoids harm to patients, providing care that increases rates of true positives and true negatives. Effective laboratory testing services uses scientific knowledge to identify testing protocols for those who would benefit and limits services to those who would not. Effective care limits overuse, underuse and misuse of laboratory testing services.

Patient-centered care is responsive and respectful of patient preferences, needs and values. Providing laboratory test preparation information in the appropriate language and at the appropriate reading level is one aspect of patient-centered care. Timely laboratory testing services reduces wait times and delays for patients and other providers of healthcare. Efficient laboratory testing services avoids waste, which includes time, energy, ideas supplies, and equipment. Unnecessary repeat testing is wasteful and inefficient laboratory testing services. Equitable laboratory testing services does not vary in quality due to patient characteristics such as gender, ethnicity, geographic location and socioeconomic status.

Adopting all six IOM aims as the definition of healthcare quality will advance medical laboratory science practice, provide opportunities for practitioners to gain new skills and improve other aspects of the healthcare delivery system. This may be accomplished

## FOCUS: PATIENT SAFETY AND THE MEDICAL LABORATORY

by incorporating methods and technology successfully used in other industries and healthcare disciplines, adopting systems thinking and a just culture work environment, and seeking opportunities to interact face-to-face with patients and other healthcare practitioners.

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