Specimen Discrepancies in a Clinical Setting

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A discrepancy is defined by Webster’s Dictionary as a “difference” or “inconsistency.” Specimen discrepancies comprise a variety of different variables, as well as degrees of severity. The main discrepancies that occur in the clinical setting are labeling errors (requisition, container, or both); anatomic sites not indicated or that are discordant with the requisition versus the container; incomplete clinical information on the requisition; specimen designations not indicated for multiple specimens; or improperly prepared specimens prior to arrival in the laboratory.

When discrepancies occur in the clinical setting, patient care is affected. The severity of the discrepancy will determine the degree to which the patient may be affected, yet all errors are potentially egregious and should be treated as such. It is imperative that the surgical pathology staff be consistently vigilant when specimens arrive in the laboratory to identify errors as quickly as possible to abate potential harm to the patient.

Identifying Discrepancies—First Steps

Identifying specimen discrepancies in the laboratory setting is a vital process to ensure proper patient care. However, the focus must also center on the root-cause analysis of such errors to prevent them from occurring in the clinical setting. To ameliorate these situations, laboratory staff must first foster communication among the clinical areas that submit specimens to surgical pathology. This is essential because perhaps the clinics do not realize the gravity of these errors as they relate to patient care and also may not fully understand the role of pathology in patient care. Once these relationships are established, a foundation is created whereby staff can discuss discrepancies constructively and build solutions to these problems as a team.

To create more unity among clinical areas and pathology, a Specimen Partnership Committee at University of Colorado Hospital (UCH) was established in 2006. This committee greatly aids pathology in educating the clinical areas on specimen submission guidelines while explaining the importance of such protocols. Risk management plays a key role in forming committees and bringing together all areas of UCH that submit specimens, while identifying key issues within certain areas. Most of these issues are predominantly related to discrepancies, and much emphasis is placed on discussing why these errors occur and what can be done to correct them.

Prominent issues range from misunderstandings on how to submit specimens to not verifying patient information while labeling specimens and requisitions. Each clinical area uses pathology specimen submission guidelines to create and continually update its own guidelines. The members of this committee comprised clinicians, surgeons, pathologists, nurse managers, nurses, physicians’ assistants, and pathologists’ assistants. The committee reviews data generated and documented in pathology on specimen discrepancies from the prior quarter. The solutions discussed at the meetings are implemented and progress is evaluated at the following meeting. The long-range goal of these meetings is ultimately to diminish the specimen discrepancy rates via root-cause analysis in the clinical setting.

There are many different specimens that can be generated during patient treatment. If a biopsy or small portion of tissue is obtained, then it is sent to surgical pathology. This also applies to specimens obtained during surgeries. Specimens such as blood or cultures are sent to a different branch of pathology, called clinical pathology (or the clinical laboratory).
Phases Where Discrepancies Can Occur

The Preanalytic Phase

The College of American Pathologists (CAP) defines 3 separate phases that are pertinent to analyzing and diagnosing patient specimens (preanalytic, analytic, and post-analytic). The first phase, termed the preanalytic phase, occurs when the patient is receiving treatment in the hospital or clinic setting. This is preanalytic because the specimens generated during this treatment process have not yet arrived in pathology for gross analysis and diagnosis. In this phase, specimen discrepancies can occur because the clinicians, nursing staff, and other support staff are mislabeling the containers and filling out the requisition forms incorrectly. A requisition must accompany all specimens because this gives pathology important clinical information about the patient, thereby aiding in diagnosis. If the requisition form does not contain complete information or if the information is inaccurate, then pathology cannot process the specimen until the proper information is obtained. Usually, the missing information is the responsible clinician, clinical history, as well as number and type of specimens. All of these are important because without the clinician, the results cannot be sent, which delays patient care. If there is inaccurate or missing information about the specimens submitted, this raises the question that the specimens submitted are not for the correct patient or procedure. Pathology must be able to verify this information as this serves as a safety net for the patient and ensures the accuracy of results.

The Analytic Phase

The analytic phase pertains to processes within pathology itself, from processing the specimens in the laboratory to diagnosis by the pathologist. The specimens are analyzed grossly in surgical pathology and subsequently sent to histology for processing. The tissue is then embedded, cut into slides, and stained. The pathologist is then ready to view the slides under the microscope and make a diagnosis.

The Postanalytic Phase

Postanalytic variables include all of the processes between completion of the analytic phase and the receipt of the results by the referring clinician. The delivery of diagnostic reports to the clinician electronically or otherwise (such as a hard copy of the report) and ease of interpretation of reports are examples of this phase.

Types of Discrepancies

The most common types of specimen discrepancies occurring in clinics pertain to the labeling of containers or requisitions. There are typically 3 types of labeling errors that can occur:

1) A specimen container or requisition may arrive in surgical pathology unlabeled, meaning the container or form lacks proper patient identification (last name, first name, and medical record number). Both the container and requisition may arrive unlabeled as well.

2) The container is identified as one patient while the accompanying requisition states a different patient, or vice versa.

3) The requisition and container are labeled with the same patient identification, but it is the wrong patient. This is very disconcerting because there is no way for the laboratory to know that this error has occurred. The only definitive way for this error to be identified is when the individual who was responsible for the error recognizes it independent of pathology’s intervention. There may also be an “accidental” or rather serendipitous epiphany in pathology during the gross examination of the specimen.

Identifying Discrepancies—The Process

Clinical areas give several reasons for the prevalence of labeling errors. Days that are busier than the average day in clinic, compounded with possible staffing shortages or untrained staff, are the most prominent explanations given. To reduce these labeling errors, clinical staff are encouraged by their superiors to implement a “double-check system” before specimens leave the clinic. The staff member labeling the requisition and container checks the patient information before placing them in the area for courier pick up. Before delivery
to pathology occurs, an appointed member of the clinical staff rechecks each specimen in the area to ensure accuracy. Many times, the initials of both staff members are recorded on a log sheet for tracking purposes. A copy of the patient log sheet is submitted with the specimens to ensure that pathology is receiving all specimens sent by the clinic. Pathology checks in the specimens, carefully watching for discrepancies. Implementing these procedures helps to reduce errors of this nature. Continual progress is monitored by surgical pathology with results communicated consistently with clinical areas (Figures 1-3).

If a pathologists’ assistant (PA) or resident requires further background medical information on the patient prior to proceeding in the gross examination of a specimen, then the medical history is reviewed on a secure hospital Web site. If the history does not match the given information on the requisition, an error could be identified. For example, a patient has a surgical procedure to repair a tendon in his hand (Patient A). Another patient (Patient B), who has surgery following Patient A, occupies the same operating room and the same surgeon performs the procedures for both patients. Patient B has one of his carpal bones removed and sent to pathology. When the requisition and container arrive in pathology, both are labeled with Patient A’s identification. The error is caught by surgical pathology when the PA checks the patient history in the hospital system to determine the reason for the procedure. The medical history for Patient A does not match the specimen received (carpal bone versus tendon repair). This is clearly a fortunate discovery; however, it is unknown how many of these types of errors are undetected, resulting in permanent medical records containing erroneous information. This also may result in patients being given diagnoses for procedures they have not received.
The error involving Patient A and Patient B is brought to the attention of the clinical staff and subsequently addressed at the partnership meeting. The staff member who labels the specimen and requisition is carrying several patient labels for different patients in a laboratory coat pocket, a practice commonly used to save time by eliminating the need to return repeatedly to the nursing station to obtain labels. The staff member inadvertently takes the incorrect labels from his or her pocket and places them on the requisition and container while neglecting to review the patient chart to ensure accuracy. Identification of this practice enables the management to implement policies forbidding this practice while reiterating the importance of double checking the patient chart and verifying which patient is receiving the procedure.

The remaining discrepancies occurring in clinic include incorrect anatomic sites designated on the requisition or container, missing clinical information on the requisition, multiple specimens for the same patient not clearly designated, and improperly prepared specimens. It is imperative that all anatomic sites, including side (right versus left, anterior versus posterior, etc) be indicated on the requisition and container. If the sites are discordant between the requisition and container, this raises the question that the specimen obtained during the procedure may not be from the intended anatomic site. Multiple specimens obtained from the same patient must be clearly designated to aid in proper diagnosis and treatment. Multiple colon biopsies extracted during a colonoscopy procedure or multiple dermatology specimens may appear the same or very similar to the pathologist under the microscope, thereby supporting the necessity for clear designations.

Careful assessment by the Specimen Partnership Committee identifies that clinical staff may not record the correct anatomic site due to miscommunication between the clinician performing the procedure and the recording staff member. Staff are also sometimes distracted while recording anatomic sites. If there is missing clinical information on the requisition, this may be attributable to improper training of the staff on how to fill out paperwork. Clinicians and managers are informed of these problems at partnership meetings and improvements are observed. Pathology also provides in-services with clinical areas to educate staff on proper specimen submission.

The majority of specimens submitted to pathology are immersed in 10% neutral buffered formalin (solution containing formaldehyde). Formalin preserves the specimen and maintains the cellular structure within the tissue, thereby preventing the tissue from decomposing and subsequently compromising the observation of pathologic processes within the cells. There are only a few protocols that require a specimen to be submitted fresh or in specific media. If a specimen is submitted to surgical pathology without formalin, it is difficult to determine the exact route of the specimen before its final destination in the laboratory. Therefore, the tissue may be compromised and only microscopic analysis will determine the extent of autolysis. The sooner the tissue is immersed in formalin, the more accurate and thorough the diagnosis will be for the patient. In the direst circumstances of specimens submitted without formalin, the specimen is completely compromised, rendering an inconclusive diagnosis for the patient and possibly interfering with patient treatment.
The majority of specimens submitted without formalin are generated in the emergency department. Risk management and pathology are able to meet with management in order to explain the importance of proper specimen submission. Pathology now understands that the emergency department is told they are not allowed to keep formalin on site due to the dangers the chemical could pose to patients and staff. Collaborative efforts among pathology, risk management, and the emergency department are fruitful, resulting in the purchase of smaller, prefilled containers; this helps eliminate the unnecessary health hazards associated with pouring formalin in an unventilated area and reducing the likelihood of spillage.

When a discrepancy occurs in clinic and the specimen is sent to surgical pathology, it must be corrected before any processing of the tissue can occur. The only individuals who may correct a discrepancy are the clinician, resident, fellow, or any other care team member involved with the procedure. Any corrections that are made must be documented in a log (database or log book) with copies of signed documentation of corrections kept on file. For those specimens that are submitted without formalin, it is administered following a conversation with the clinician to verify that the specimen does not need a specific protocol performed. If the specimen does not need a specific protocol, then the clinician and staff are informed that the specimen must come in formalin, and these discrepancies are also documented appropriately.

**Conclusion**

For error rates to consistently decline, enhanced and continual communication among the clinical areas and pathology is a necessity. Clinician to clinician communication enhances success rates due to strengthening of leadership roles and encouraging staff to link patient care with proper submission of specimens. The prominent hurdles in maintaining a low discrepancy rate include staffing shortages, turnover, and training of new staff. Discrepancies will tend to elevate in situations where staff are learning new processes, along with staff being overworked.

Specimen discrepancies are a common denominator in all clinical areas with varying degrees of fluctuation throughout the various departments. “To err is human,” but how humans overcome these errors and attempt to evolve in the daily clinical setting is the lynchpin for success in reducing discrepancies. Communication, education, root-cause analysis, and collaborative efforts are powerful mainstays in the success of this challenging and vexing problem. IM

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