

Patient Safety Tip of the Week

April 15, 2014

Specimen Identification Mixups

Mixups... Last week we talked about [breastmilk mixups](#). And we've previously talked about [baby mixups](#). And recently we've had a flurry of hits on our previous columns regarding specimen mixups (Patient Safety Tips of the Week for October 9, 2007 "[Errors in the Laboratory](#)", November 16, 2010 "[Lost Lab Specimens](#)", March 6, 2012 "[Lab Error](#)", and January 22, 2013 "[You Don't Know What You Don't Know](#)" and our April 2012 What's New in the Patient Safety World column "[Specimen Labeling Errors](#)").

Standardized measurements of surgical specimen identification defects have been lacking. But recently multidisciplinary members of a panel from hospitals participating in the Michigan Health and Hospital Association (MHHA) Keystone Center for Patient Safety and Quality developed a set of practical measures to quantify specimen identification defects in the preanalytic phase ([Bixenstine 2013](#)). They developed 12 measures (6 container and 6 requisition identification defects), then piloted data collection at 69 hospitals participating in the MHHA Keystone project over a 3-month period. Overall, there were identification defects in 2.9% of cases. There were defects in 1.2% of containers and in 2.3% of requisitions.

An excellent review on preventing specimen mixups was published earlier this year by Dr. Wolfgang Weyers ([Weyers 2014](#)). Though written from the perspective of a dermatopathologist, it really applies to all surgical specimen mixups (and really to a whole host of laboratory specimen mixups, too). He nicely describes the literature on the issue of specimen mixups and discusses ways to minimize the risks using several themes:

- Standardization
- Automation
- Readability and understandability (legibility and using non-confusing terms)
- Redundancy
- Orderliness/tidiness/cleanliness
- Mutual control to reduce chance of downstream errors
- Communication

Weyers notes that **in the lifecycle of a surgical specimen it may go through 20+ people and several workplaces**. It can be even more complicated when specimens are going to another facility or organization.

Standardization

Weyers emphasizes that good organization of all the steps involved is the best way to prevent specimen mixups. That begins with standardization. Examples he provides are always taking sample bottles with formalin from the same place, always depositing specimens in the same way, arranging slides or cassettes in the same manner, and many others. Color-coding of specimens is another standardized method often used, though Weyers notes even it is subject to error.

Automation

Using computers and technology is another means to prevent mistakes. Because manual labeling of specimens is error-prone, automatic labeling of blocks or specimens in a printer may help prevent mistakes. **Barcoding** significantly helps alleviate transcription errors.

Readability and Understandability

While illegible handwriting is a frequent source of error leading to specimen mixups, even computer use can lead to errors. For example, he notes that short codes inadvertently keyed into the computer transposed can result in serious errors. He therefore notes that sometimes using a longer code that conveys more obvious meaning may be preferable.

Redundancy

Using at least 2 unrelated data elements (as required anyway by Joint Commission) is important in avoiding mixups. That is particularly important when names are the same or similar.

Orderliness/Tidiness/Cleanliness

Weyers would be appalled to see our desk when we are doing columns! He really emphasizes how workplaces in the lab must be tidy and the need to **keep only one procedure in sight**. That applies equally in the operating room where files and specimens of the current patient should be kept separate from all other files and specimens.

He also cautions against labeling bottles and request forms prior to biopsies because the course of action is sometimes changed during the procedure (eg. change in the sequence of biopsies or addition of another biopsy).

Checking the specimen bottles and request forms for completeness is extremely important. Even the simple act of ensuring that any adhesive labels adhere firmly to the specimen bottle is critical.

Order also needs to be maintained during unpacking of specimens and all other subsequent work.

In discussing cleanliness, he notes how specimens or pieces thereof may slip and fall or flip away. For that reason (and others) the floor should be kept very clean. For the same reason the floor should be kept a light uniform color without decorations that might make it difficult to spot a dropped specimen. (See also our November 16, 2010 Patient Safety Tip of the Week "[Lost Lab Specimens](#)" for more information on lost specimens.) He also notes how "ribbons" of tissue specimens may be transferred from an instrument to a slide or float in a bath and be inadvertently picked up on another slide (see also our January 22, 2013 Patient Safety Tip of the Week "[You Don't Know What You Don't Know](#)").

Mutual Control

Weyers describes two forms of mutual control: simultaneous and downstream. By simultaneous mutual control he means having two individuals involved in the same action calling attention immediately to any error by the other. He notes these should be done in the most vulnerable steps of the biopsy pathway. He notes that accessioning of specimens in the laboratory, including unpacking and sorting and numbering bottles and request forms, is one particularly vulnerable time and therefore should be done by two individuals simultaneously. (Note, however, some of our prior comments on double checks as in our October 16, 2012 Patient Safety Tip of the Week "[What is the Evidence on Double Checks?](#)").

An example of downstream mutual control might be identifying and marking any discrepancies so that downstream work recognizes those errors.

Communication

Communication is two-way. Adequate completion of the request forms is so important that Weyers recommends the physician himself or herself complete these. Delegation to someone who may not understand the importance of such entries often results in errors or incomplete requests. Similarly, communication back to the requesting physician is important, particularly when there has been incomplete information on the request form.

Weyers also has lots of other practical recommendations in his review:

It's Everybody's job!

Weyers notes that every one of the 20+ people who may be involved with the specimen start-to-end processes has a role in detection of potential or actual errors. He notes that even the secretaries transcribing reports can identify such errors. For example, they might note inconsistencies such as description of a cancer in a report that concludes "no cancer found".

The paperclip did it! We almost used this for the title of today's column! Weyers even notes the role the lowly but highly utile paperclip can play in causing specimen mixups. He notes that paperclips that attach some additional information to a request form may catch another request form, resulting in more than one form being put aside after dictation, and the next report may be issued erroneously for the wrong patient. Of course, in the old paper medical record era we often saw reports in the wrong patient chart because they adhered to another report.

Weyers also issues a warning we've made on multiple occasions: "**Don't ever allow files on 2 patients open at same time**". That significantly increases the possibility that data meant for one patient may be interpreted or included for another patient. He also reminds us to **beware of "cut and paste"** noting that sometimes there is on the computer clipboard information from a previous patient that inadvertently gets pasted into a new patient record.

He also discusses how interruptions and distractions may contribute to errors and how both high and low workloads may facilitate errors.

He has a good discussion about the importance of **documentation of errors**. That obviously should include not only errors that resulted in patient harm or near misses but also minor errors that may uncover latent factors that may contribute to future errors. Along that vein, the system described by Bixenstine et al. looks all the more important.

He also describes DNA molecular identity testing for cases in which specimen mixups are suspected (we've also discussed such testing in several of the columns referenced below).

Read the Weyers article. It has many more good ideas than we can summarize in our column. And read our many prior columns addressing the serious issue of specimen mixups.

Some of our other columns on errors related to laboratory studies:

- October 9, 2007 "[Errors in the Laboratory](#)"
- November 16, 2010 "[Lost Lab Specimens](#)"
- October 11, 2011 "[LEAN in the Lab](#)"
- March 6, 2012 "["Lab" Error](#)"
- April 2012 "[Specimen Labeling Errors](#)"
- January 22, 2013 "[You Don't Know What You Don't Know](#)"

References:

Bixenstine PJ, Zarbo RJ, Holzmueller CG, et al. Developing and Pilot Testing Practical Measures of Preanalytic Surgical Specimen Identification Defects. American Journal of Medical Quality 2013; 28(4): 308-314 first published on January 15, 2013
<http://ajm.sagepub.com/content/28/4/308.abstract>

Weyers W. Confusion - specimen mix-up in dermatopathology and measures to prevent and detect it. Dermatol Pract Concept 2014; 4: 27-42
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