

# The Pathology Resident Wiki: A Valuable Resource for Residents to Use on Call

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## Abstract

Situations encountered on-call often bring some of the most unique and educationally rich questions to a pathology resident's attention which can be difficult to incorporate into institutional memory. A searchable online site (wiki) provides an easily accessible platform by which to do this and could serve as a valuable after-hour resident resource. Therefore, we evaluated a wiki's usefulness by creating a wiki using Campuspack for residents to catalog uncommon questions/situations encountered on call or rotations. After 41 months in use, analytic software embedded in the site was queried for usage statistics and one year's cohort of residents was surveyed to assess the wiki's value. Since the sites inception, over 7200 individual interactions with the site were recorded, with June through August being the most active period each year. Of the 15 residents surveyed, 60% utilized the site to answer a clinical question at least monthly and the majority (93%) considered the wiki a valuable on call resource. These findings suggest that an on-call wiki is a convenient tool for capturing the unique situations that pathology residents encounter. The majority of residents find the site a valuable resource and utilize it to answer clinical questions.

## Keywords

education, informatics, on call, resident, wiki

## Introduction

Twenty-four-hour laboratory operations depend on a highly trained and dedicated team performing numerous duties extending from patient identification to coordinating action on results. One facet of the highly complex processes within the laboratory that routinely requires direct pathologist input is when a specimen, clinician request, or patient situation falls outside the standard operating procedures and requires immediate attention. These unique instances are excellent learning opportunities for residents, rich in practical teaching in laboratory and patient management, utilization, systems-based practice, and communication.

One difficulty with widely utilizing these experiences on a consistent basis in training programs is the unpredictability and intermittent nature of outside-the-norm situations, coupled with the fact that they seem to occur disproportionately after normal working hours. While manual call logs and face-to-face review conferences are useful in this regard, the information gleaned

from these is often not easily accessible to future residents. As a way to both encourage resident learning and to improve patient care, an on-call wiki was established to help residents share and learn from experiences and provide an additional resource to be used for call duties.

A wiki is a Web site with real-time editable content that users can update almost anywhere. As a wiki is assembled, its creation parallels the building of knowledge in users and in the end becomes a sort of database of that knowledge.<sup>1</sup>

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Wikis are part of the interactive Internet of Web 2.0 and have been noted to be useful for documentation of knowledge, team-based learning, peer feedback, administrative tasks, and possibly useful for satisfying accreditation requirements.<sup>1,2</sup> With the explosion of electronic data, desired information often exists electronically, but a need exists to organize data to enable practical use.<sup>3</sup> A wiki is a tool to help facilitate data organization and can be used to link together resources on a topic.<sup>1</sup>

Several wikis have been described for various uses in medical training and laboratory medicine. Some examples include textbooks,<sup>2</sup> teaching tools for subspecialty pathology education,<sup>4,5</sup> a rotation guide for obstetrics and gynecology trainees in Ireland,<sup>6</sup> and a central data repositories for radiology and internal medicine residencies.<sup>7,8</sup> A call log similar to ours has been used in an effort to optimize laboratory operations by studying laboratory consultations or “clinical utilization.”<sup>9</sup> This database gathered written descriptions of calls received by clinical pathology residents and analyzed the content of calls over a year’s time, identifying several opportunities for clinical education specific to their institution.

There are multiple benefits wikis can offer. A study from the University of Pittsburgh pathology residency program showed improved posttest performance after incorporating the creation of a wiki for a genomics, research, and informatics course.<sup>4</sup> Wikis are well suited for the development of a survival guide and one-stop shop for residents and potentially offer more up-to-date information by having multiple editors.<sup>4,7</sup> Another potential advantage is that resident reliance on experienced senior laboratory staff for information, particularly for more “esoteric” concerns during late shifts, can be reduced. They may also encourage resident-to-resident interaction.<sup>1,6</sup> To this end, we established an on-call questions and answers wiki and attempted to evaluate its usefulness to pathology residents at our institution.

## Methods

A wiki named the “Pathology Resident On Call Manual” was created using Campuspack (Learning Objects, Inc., Washington, DC), a platform including “portlets” that incorporates blogs, journals, and podcasts and allows instructors to integrate social media and learning tools into their online academic offerings. The secure site was administered by the institution’s information technology department and accessed via the Blackboard learning management system (Blackboard Inc., Washington, DC), allowing residents to utilize the identical username and password used for all institutional and laboratory databases. The site was available both on- and off-campus, accessible from desktop/laptop computers, tablets, and mobile devices and agnostic with regard to operating system and Web browser. Access was only granted to pathology faculty, residents, and support staff by permission of the residency program director. All posts were attributed to the author, and anonymous posts were not allowed. Due to

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) concerns, all users were instructed not to post any form of protected health information on the wiki.

Using the blog portion of the wiki, residents voluntarily added to a list of questions/situations encountered on call or on rotations with their resolution and provided links to useful supplemental resources such as portions of policy/procedure manuals and the institution’s online laboratory handbook (Figures 1 and 2). During the regularly scheduled, monthly face-to-face call review, similar information was entered “live.” All users were free to comment on or edit existing posts at any time. In addition to the blog, tutorial videos, instructional PowerPoint presentations, frequently asked questions lists, departmental contact information, and links to commonly used Web sites (ie, test menus for referral laboratories) were also made available. Most importantly, the content on the site was searchable by any word in the title or text of a post or comment.

After 41 months of use, data analytics software embedded in the platform was queried for usage statistics. Further, current and recently graduated residents from the 2014 to 2015 academic year completed an online survey to assess their opinion of the wiki’s value (Table 1).

## Results

Over the 41 months of use, 7284 events occurred including the addition of individual new blog posts or items and comments on existing content (Figures 3 and 4). Over the years, the highest number of events was recorded in July (2028 events) with those months accounting for 28% of all activity. During the examined period, a total of 2705 posts and 572 comments were added to the site. The top two contributors triggered 52% and 25% of events, respectively.

Each of the 15 residents to whom the survey was distributed responded (100%), representing all years of training and including the previous year’s graduates and the current first-year class. Fourteen (93%) stated that they had logged on to the wiki at some point during their training, and 9 (60%) utilized information on the site to answer a question on call or on rotation. Two (13%) residents related that they accessed the wiki for this purpose approximately once annually, 6 (40%) used it once per month, and 1 (7%) viewed information on the site each time they were on call. Of note, 4 (27%) of the respondents stated that they were new residents and had not yet been on call. When asked about their views on the wiki’s value as a resource, 6 (40%) felt that it was “very valuable,” 8 (53.3%) said that it was “valuable,” and 1 (6.7%) was “neutral.”

## Discussion

Understanding the best use of wikis to enhance education is an open area for investigation. There is no question that use of Web resources will increasingly become a part of physician education and practice in no small part due to the

**Figure 1.** Screen shot of wiki landing page with emergency phone list and useful resources on the left. Tutorial videos and the “on-call questions and answers” blog are visible on the right.

widespread availability of information of great breadth and depth. The importance of information availability in health care is highlighted in the article, “The Four Habits of High-Value Health Care Organizations,” stating that each member of the clinical team should have the information he or she needs by providing unobstructed access.<sup>10</sup> Benefits to using Web-based wiki-like tools in graduate medical education have been discussed by others<sup>2,4,6-9,11</sup> but include ease of access from multiple locations, searchability, and the provision of a means by which users can edit content. To our knowledge, however, this is the first usage of a wiki to capture unique pathology resident call events and use them to facilitate resident education.

A similar project at a large medical center strove to capture all clinical pathology resident call events in a web-based database.<sup>9</sup> One benefit to their global approach, versus only attempting to capture calls that were unique, was the added ability to notice recurring themes in the calls they received. Doing this, they were able to identify several areas for clinician education. One eventual shortcoming of this approach is documentation fatigue. It is notable in their study, however, that more than 99% of all documented calls were able to be categorized and analyzed on retrospective review.

For pathology residents, particularly while on call, having the right knowledge at the right time is critical to ensure seamless laboratory operation and appropriate patient care. As with

Pages + New Page Tags Settings

## Serum chromium

Edit Delete

Question: An orthopedic surgeon from NOH was interested in knowing if he could get the results of a chromium in joint fluid the next day.

Answer: No. We send this test out to ARUP, with the turnaround time from their receipt being 1-4 days (I would tell them to expect the latter). Also, the test is set up for SERUM, so ARUP may turn the sample down and/or put a disclaimer on the results

<http://www.testmenu.com/public/cltdDetail.aspx?crud=Retrieve|121869>

By the way, why did he make this request? In patients with metal on metal joint prosthesis, breakdown can lead to release of Co an Cr locally and has been associated with pain, teratogenicity, instability due to decreased osteoblast activity, and systemic toxicity.

<http://www.ncbi.nlm.nih.gov/pubmed/22155921>

**Figure 2.** Screen shot of an item in the “on-call questions and answers” blog page. The page was found using a search term of “serum.”

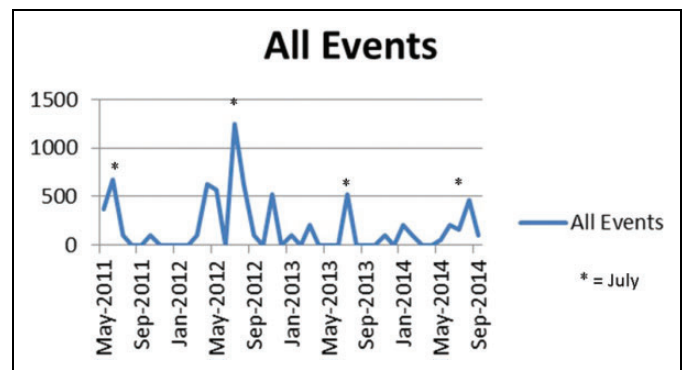
**Table 1.** Questions on Online Survey Completed by Residents.

- What was your year in residency last year?
- Have you ever logged into the wiki?
- Have you ever used the wiki to answer a question or find information while on call or a rotation?
- If you answered “yes” above, how often did you use it (never, once a year, once a month, almost every time I’m on call or a new rotation)?
- How valuable do you think the wiki is/will be as a resource for residents on call/rotations?\*

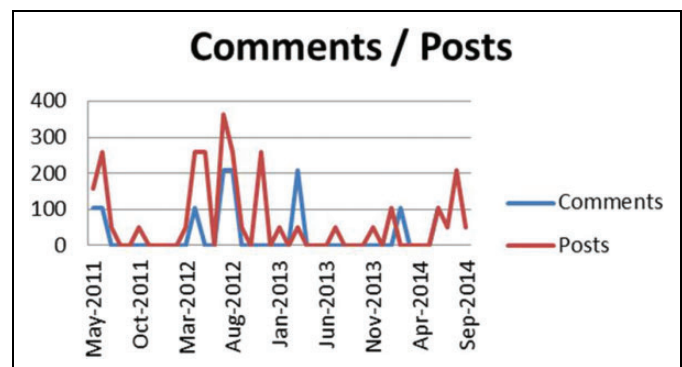
\*Likert-style responses: not valuable at all, at most minimal value, neutral, valuable, very valuable.

all specialties, residency training represents a time in one’s career in which an individual’s fund of knowledge and experience are often mismatched with his or her needs. In one study of all types of clinical “information needs events,” 47% were unmet, suggesting that either answers were not found or sought due to competing obligations.<sup>12</sup> It has been shown that in most of these instances, the informational needs are basic (ie, schedules and educational materials).<sup>7</sup> Online tools such as wikis offer a convenient, readily accessible source for residents to find this type of data.

Other advantages of wiki use include gaining communication skills through creating and editing materials, practicing conscientious Web use through assessment of resources, and practice in the generation of appropriate narrow content searches. Also, wikis may serve as a vehicle for documenting these types of learning activities for regulatory agencies such as the Accreditation Council for Graduate Medical Education.<sup>1,2,9</sup>



**Figure 3.** The number of events (user logins, addition of individual new blog posts or items, and comments on existing content) per month (\* = July of each year).



**Figure 4.** Number of newly added posts and associated comments per month.

We believe that there are 3 aspects to making such a wiki successful. First, using an off-the-shelf product encourages participation. Campuspack is compatible with mobile devices, but more importantly it uses interfaces that are similar to those used by many learning management systems with which residents are likely already familiar. Indeed, the text boxes, the means by which to link documents, and “portlet” architecture were virtually identical to the Blackboard system used by residents at multiple times during their training which virtually negated the need for user tutorials. Second, the robustness of the site’s search function is key to a wiki’s utility. A user is much more likely to repeatedly access the site if they can quickly find the information that they need. Anecdotally, 1 resident stated that “to be useful to me, the wiki needs to give me what I need with a quick search at 2:00 in the morning for that ‘weirdo’ question.” Finally, the presented information must be current. To this end, one of the tasks appointed to the incoming chief resident each year is to review all of the content on the site to be sure that it is accurate (phone/pager numbers, quoted policies, etc). As the wiki continues to grow and this task becomes more time consuming, small teams of residents could review various sections of the wiki as an educational activity with oversight from the program director and chief resident.

One of the major inherent issues with quick widespread adoption of a narrowly focused wiki is the time that it takes for the site to accumulate enough information/experiences to be useful. A major reason that sites such as Wikipedia is successful is the sheer volume of data available. It should be expected that for a time following the release of a site of this type that substantially more effort will be expended by users entering than retrieving immediately useful information. Ways in which this was addressed included repeated reminders from the program director and chief residents to post content, use of the site during face-to-face call reviews, and the institution of a monthly “raffle” in which a resident was entered once for each post/comment they made during that time.

Overall, 60% of residents utilized the wiki to answer a specific question when on call or a rotation by the fourth year of the site’s existence, with 6 (40%) using it at least once per month for this purpose. It is safe to infer that both wiki users and nonusers were using additional resources to help them respond to questions received on call. However, it is not clear why 40% of respondents hadn’t used the wiki. Twenty percent were in their first year of training at the time of the survey, meaning they would not have started taking overnight call, giving them limited questions to respond to. One possible improvement to increase utilization is creation of a mobile app or mobile Web site. The Web site is accessible on mobile devices; however, the login screen is not optimized for mobile use. Reading, posting, and commenting are mobile friendly, so the development needed to add more functionality appears to be limited.

Although only 60% of residents used the wiki, the overwhelming majority (93%) felt that the site served as a

valuable on-call resource. This indicates there was ideological buy-in. An important area for future study would be to understand reasons for nonuse as practical buy-in is critically important for a wiki’s success. As noted earlier, due to the time necessary to accumulate a “critical mass” of information, we chose to assess the residents’ use of the site with the cohort that was aware of the site for virtually all of their training.

Several trends were noted, even from our small wiki. The majority (77%) of contributions were posted by 2 users. This phenomenon has been observed with other successful wikis in that they often have a small group of prolific contributors.<sup>2</sup> Wikipedia itself has 44% of its content contributed by 0.1% of editors.<sup>13</sup> As is likely no surprise, the highest volume of overall user activity (addition of blog posts or items and comments on existing content) occurred in July. This corresponded with the time in which junior residents first began taking call and when the wiki demonstration was given to incoming first-year trainees.

Information quality on a user-edited wiki is often a concern. Variables associated with higher content quality are a high number of editors, more page views, article length, number of edits, and total hyperlinks.<sup>2</sup> While the low number of potential editors and page views could be viewed as potential weaknesses of our site, the narrowly focused content, carefully selected population of users, and short length of posts may mitigate these factors. Universal attribution of content to a named author (who happens to be a fellow resident) also likely helped ensure an additional degree of informational accuracy.

Wikis use will continue to evolve. They have become easier to implement bringing more applications within reach. Combined experience has taught us they are a robust and flexible platform, making them suitable for many uses and an important tool to consider when looking for opportunities to improve education and patient care.

## Conclusion

A resident on-call wiki is a convenient, accessible online tool for capturing the unique situations that pathology residents encounter while on call and rotations. The majority of residents find such a site a valuable resource and have utilized it to answer clinical questions.

## Authors’ Note

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