

Learning Dermatopathology in the Digital Age

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In recent years, advances in technology have allowed the study of pathology to transition into the digital realm. Histologic sections can now be viewed on mobile devices and computer screens easily and in many cases for free to increase exposure to representative learning cases. Many of these images have labels and markings to facilitate identification of key histologic findings. This article highlights some of the programs and Web sites that host these digital slides and rank them in the order of their utility to students of dermatopathology.

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As in the study of clinical dermatology, establishing a strong fund of knowledge regarding dermatopathology requires visual exposure to countless representative cases. In the not-so-distant past, textbooks relied on grayscale representations to illustrate these diagnoses, but residents today enjoy full-color images; however, textbooks lack the plasticity of digital media, which allow for more immersive interaction with the content. With technological advances in whole-slide imaging, teaching cases can be saved and shared, and rare diagnoses can be studied by individuals who are far removed from the original specimen.¹ Even more exciting is that many of the applications (apps) that facilitate digital learning of dermatopathology are available free of charge. In this article, I will review some of the available apps, focusing on their usability, content, and utility

as a learning resource for dermatologists at all stages of training. They are discussed in the order of their utility to students of dermatopathology. I have no financial ties to any of the products reviewed, and my recommendations reflect my opinions and observations after real-world use.

Winner: Clearpath

The Clearpath app (<http://www.dermpathlab.com/clearpath/>) is a fantastic representation of well-executed digital pathology software. Initially released for \$50.00 in 2013, the app has since become free while maintaining a steady stream of updates and expanded content. The app is incredibly intuitive and easy to use, made possible by its modern user interface and versatile search function (Figure).



User interface of Clearpath app with definition of key features of mucinous eccrine carcinoma. Photograph courtesy of Clearpath by the Dermatopathology Laboratory of Central States.

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For those just beginning to learn dermatopathology, the glossary contains well-written definitions as well as images, which have highlighting that can be toggled on and off to show an area of interest; for instance, if you cannot wrap your mind around the concept of a “grenz zone,” the app can highlight and focus your attention on the respective area in a related image. The app’s library contains more than 250 diagnoses; by clicking on a diagnosis, you are first shown several images displaying features of the pathology identified with highlighting. Then you can study a digital slide as if your tablet was a microscope stage, panning and zooming as you choose. When you are comfortable with the slides, the integrated quiz mode allows for board review with up to 25 answer choices per slide. Although Clearpath’s image-intensive program does require a wireless connection, it also offers the ability to download slides for offline review.

The app has few notable shortcomings related mostly to compatibility, as it is only available for download from the Apple App Store for iPad. Additionally, in comparison to other programs, there is a relative paucity of pathology images to look at, though new diagnoses frequently are added. Regardless, for those with iPads, it is the most refined introduction to a digital dermatopathology product, and a must-have download.

Runner-up: myDermPath

In my February 2014 column,² I interviewed Dirk M. Elston, MD, and we briefly discussed the myDermPath app (<http://mydermpath.com/>), which had just recently been made available for free. The myDermPath app excels in the sheer volume of diagnoses it presents—more than 1000 in all—including more unusual pathologic entities. Physicians looking for images of barnyard pox or inflammatory myofibroblastic tumor, for example, do not need to go any further. The pathologic images presented are accompanied by coherent descriptions of clinical features and usually are supplemented with clinical photographs. Furthermore, the app includes a video primer on normal histology narrated by Dr. Elston, a step-by-step algorithm for arriving at a diagnosis, and detailed descriptions of immunofluorescence studies and stains. These additional features make myDermPath a more comprehensive application and a more useful reference source. Its universal compatibility on a range of digital devices makes access to myDermPath convenient for users on any platform (ie, iOS, Android, Web).

The app’s most notable limitation is that, at the time of this writing, it feels somewhat less polished, especially compared to the Clearpath app.

This antiquated feel also is evident in the app’s apparent instability on my smartphone, as it frequently stops responding while I am navigating through the menus or looking at histology and often makes it cumbersome to use. This stability issue is not evident on the Web-based version. The app also does not fully support the larger screen sizes of some of the newer smartphones, and therefore the display includes wasted dead space. These faults aside, the volume of material presented and the app’s comprehensive content still make myDermPath a useful addition to your digital dermatopathology repertoire.

Honorable Mention: Derm In-Review

Derm In-Review (<http://dermatologyinreview.com/Merz>) is sponsored by Merz Pharma and is well known as a broad-reaching resource that reviews the entire breadth of our field for those preparing for in-service or the boards examination. To learn dermatopathology, there are 2 ways to access the digital images: through the Web-based interface and via the mobile app (compatible with iOS and Android). The slides are not categorized but rather are presented in a random order to facilitate quiz taking. The slide images are only photographs of individual features and are not meant to be manipulated as true digital slides; however, the images are good representations of diagnoses, and short descriptions help with learning histologic features. Currently, Aurora Diagnostics (Woodbury, New York) is funding the dermatopathology portion of Derm In-Review, and the online application has already seen a face-lift. With the addition of more content, an updated mobile app, and possibly digital slides, this app will become a more useful tool for learning dermatopathology. Access to Derm In-Review is free with registration on the Web site.

Honorable Mention: DermPath University

DermPath University (<http://www.dermpathdiagnostics.com/university/digitaldermpath>) is a Web-based educational resource of DermPath Diagnostics that houses a large collection of digital slides. These slides are categorized and can be viewed as unknown cases or with the diagnoses revealed. The images are of high quality and the software is intuitive; however, aside from the diagnosis, slides are not labeled with histologic features or comments about them. The best way to think of this collection is to imagine it is a digital version of the organized slide boxes many residency programs have for teaching purposes. Access to DermPath University is free with registration on the Web site. DermPath University also is home to weekly

live teledermatology sessions; the schedule can be found on the Web site.

Online Courses: DermPathMD and MDlive

Although structured differently than the other apps described in this article, DermPathMD (<http://www.dermathmd.com>) and MDlive (http://www.mdlive.net/dermpath_sch.htm) offer free online dermatopathology courses that are also valuable resources. Rather than discrete apps or digital slides, the courses available from these sources are presented in a lecture-based format to provide overviews on specific topics in dermatopathology. DermPathMD has lectures available as PDFs to download, while MDlive has narrated presentations. Both of these resources are good supplements to a dermatopathology textbook and can be used to obtain a basic foothold on the subject matter before more detailed study.

Conclusion

Learning dermatopathology is no longer done exclusively behind a microscope. The resources presented here bring the experience of learning and reviewing histology slides to your fingertips, sharpening your ability to hone in on the correct features to make an accurate diagnosis. Studying from these digital resources is convenient, comprehensive, and generally free of charge. I hope that you enjoy experimenting with these programs to find a combination that suits your educational needs.

REFERENCES

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