# Impact of an Introductory Dermatopathology Lecture on Medical Students and First-Year Dermatology Residents

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## PRACTICE **POINTS**

- Introductory dermatopathology education in medical school and the first year of dermatology residency has the potential to improve foundational knowledge and better prepare learners for residency and beyond.
- Confidence in dermatopathology can be strengthened through early curriculum interventions such as targeted dermatopathology lectures.

Dermatopathology education, which comprises a large portion of the dermatology residency curriculum, is crucial and helps residents learn how to diagnose and manage dermatologic conditions. Residency programs use many resources to facilitate dermatopathology education, including virtual sessions, conventional microscopy training, and social media posts; however, the topic may not be covered early enough in the curriculum. Improving dermatopathology education in medical school and the first year of residency has the potential to better prepare medical students for dermatology residency and clinical practice. We created and presented an introductory interactive dermatopathology lecture for residents during their first-year orientation and for medical students during their dermatology rotation from May 2024 through November 2024. Overall, this introductory lecture appears to have improved dermatopathology knowledge and learner confidence, and we would encourage all dermatology programs to implement a similar curriculum.

Dermatopathology education, which comprises approximately 30% of the dermatology residency curriculum, is crucial for the holistic training of dermatology residents to diagnose and manage a range of dermatologic conditions.[1] Additionally, dermatopathology is the topic of one of the 4 American Board of Dermatology CORE Exam modules, further highlighting the need for comprehensive education in this area. A variety of resources including virtual dermatopathology and conventional microscopy training currently are used in residency programs for dermatopathology education.[2,3] Although used less frequently, social media platforms such as Instagram also are used to aid in dermatopathology education for a wider audience.[4] Other online resources, including the American Society of Dermatopathology website (www.asdp.org) and DermpathAtlas.com, are excellent tools for medical students, residents, and fellows to develop their knowledge.[5] While these resources are accessible, they must be directly sought out by the student and utilized on their own time. Additionally, if medical students do not have a strong understanding of the basics of dermatopathology, they may not have the foundation required to benefit from these resources.

Dermatopathology education is critical for the overall practice of dermatology, yet most dermatology residency programs may not be incorporating dermatopathology education early enough in training. One study evaluating the timing and length of dermatopathology education

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The authors have no relevant financial disclosures to report.
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*Cutis.* 2025 February;115(2):55-57. doi:10.12788/cutis.1168

during residency reported that fewer than 40% (20/51) of dermatology residency programs allocate 3 or more weeks to dermatopathology education during the second postgraduate year.[1] Despite Ackerman[6] advocating for early dermatopathology exposure to best prepare medical students to recognize and manage certain dermatologic conditions, the majority of exposure still seems to occur during postgraduate year 4.[1] Furthermore, current primary care residents feel that their medical school training did not sufficiently prepare them to diagnose and manage dermatologic conditions, with only 37% (93/252) reporting feeling adequately prepared.[7,8] Medical students also reported a lack of confidence in overall dermatology knowledge, with 89% (72/81) reporting they felt neutral, slightly confident, or not at all confident when asked to diagnose skin lesions.[9] In the same study, the average score was 46.6% (7/15 questions answered correctly) when 74 participants were assessed via a multiple choice quiz on dermatologic diagnosis and treatment, further demonstrating the lack of general dermatology comfort among medical students.[9] This likely stems from limited dermatology curriculum in medical schools, demonstrating the need for further dermatology education as a whole in medical school.[10]

Ensuring robust dermatopathology education in medical school and the first year of dermatology residency has the potential to better prepare medical students for the transition into dermatology residency and clinical practice. We created an introductory dermatopathology lecture and presented it to medical students and first-year dermatology residents to improve dermatopathology knowledge and confidence in learners early in their dermatology training.

## Structure of the Lecture

Participants included first-year dermatology residents and fourth-year medical students rotating with the Wayne State University Department of Dermatology (Detroit, Michigan). The same facilitator (H.O.) taught each of the lectures, and all lectures were conducted via Zoom at the beginning of the month from May 2024 through November 2024. A total of 7 lectures were given. The lecture was formatted so that a histologic image was shown, then learners expressed their thoughts about what the image was showing before the answer was given. This format allowed participants to view the images on their own device screen and allowed the facilitator to annotate the images. The lecture was divided into 3 sections: (1) cell types and basic structures, (2) anatomic slides, and (3) common diagnoses. Each session lasted approximately 45 minutes.

*Section 1: Cell Types and Basic Structures*—The first section covered the fundamental cell types (neutrophils, lymphocytes, plasma cells, melanocytes, and eosinophils) along with glandular structures (apocrine, eccrine, and sebaceous). The session was designed to follow a question-and-answer format to encourage knowledge retention and allow learners to think through each slide. First, participants were shown histologic images of each cell type and were asked to identify what type of cell was being shown. On the following slide, key features of each cell type were highlighted. Next, participants similarly were shown images of the glandular structures followed by key features of each. The section concluded with a review of the layers of the skin (stratum corneum, stratum granulosum, stratum lucidum, stratum spinosum, and stratum basale). A histologic image was shown, and the facilitator discussed how to distinguish the layers.

*Section 2: Anatomic Sites*—This section focused on key pathologic features for differentiating body surfaces, including the scalp, face, eyelids, ears, areolae, palms and soles, and mucosae. Participants initially were shown an image of a hematoxylin and eosin–stained slide from a specific body surface and then were asked to identify structures that may serve as a clue to the anatomic location. If the participants were not sure, they were given hints; for example, when participants were shown an image of the ear and were unsure of the location, the facilitator circled cartilage and asked them to identify the structure. In most cases, once participants named this structure, they were able to recognize that the location was the ear.

*Section 3: Common Diagnoses*—This section addressed frequently encountered diagnoses in dermatopathology, including basal cell carcinoma, squamous cell carcinoma, squamous cell carcinoma in situ, epidermoid cyst, pilar cyst, seborrheic keratosis, solar lentigo, melanocytic nevus, melanoma, verruca vulgaris, spongiotic dermatitis, psoriasis, and lichen planus. It followed the same format of the first section: participants were shown an hemotoxyllin and eosin–stained image and then were asked to discuss what the diagnosis could be and why. Hints were given if participants struggled to come up with the correct diagnosis. A few slides also were dedicated to distinguishing benign nevi, dysplastic nevi, and melanoma.

## Pretest and Posttest Results

Residents participated in the lecture as part of their first-year orientation, and medical students participated during their dermatology rotation. All participants were invited to complete a pretest and a posttest before and after the lecture, respectively. Both assessments were optional and anonymous. The pretest was completed electronically and consisted of 10 knowledge-based, multiple-choice questions that included a histopathologic image and asked, "What is the most likely diagnosis?," "What is the predominant cell type?," and "Where was this specimen taken from?" In addition to the knowledge-based questions, participants also were asked to rate their confidence in dermatopathology on a 5-point Likert scale ranging from 1 (not confident at all) to 5 (extremely confident). Participants completed the entire pretest before any information on the topic was provided. After the lecture, participants were asked to complete a posttest identical

to the pretest and to rate their confidence in dermatopathology again on the same scale. The posttest included an additional question asking participants to rate the helpfulness of the lecture on a Likert scale ranging from 1 (not helpful at all) to 5 (extremely helpful). Participants completed the posttest within 48 hours of the lecture.

Overall, 15 learners participated in the pretest and 12 in the posttest. Of the 15 pretest participants, 3 were first-year residents and 12 were medical students. Similarly, in the posttest, 2 respondents were first-year residents and 10 were medical students. All responses contained complete pretests and posttests. The mean score on the pretest was 62%, whereas the mean score on the posttest was 75%. A paired *t* test indicated a statistically significant improvement ($P=.017$). In addition, the mean rating for confidence in dermatopathology knowledge before the lecture was 1.5 prior to the lecture and 2.6 after the lecture. A paired *t* test demonstrated statistical significance ($P=.010$). The mean rating of the helpfulness of the lecture was 4.67. The majority (91.7% [11/12]) of the participants gave a rating of 4 or 5.

## Impact of the Lecture on Dermatopathology Knowledge

There is a gap in dermatopathology education early in medical training. Our introductory lecture led to higher posttest scores and increased confidence in dermatopathology among medical students and dermatology residents, demonstrating the effectiveness of this kind of program in bridging this education gap. The majority of participants in our lecture said they found the session helpful. A previously published article called for early implementation of dermatology education as a whole in the medical curriculum due to lack of knowledge and confidence, and our introductory lecture may help to bridge this gap.[8] Increasing dermatopathology content for medical students and first-year dermatology residents can expand knowledge, as shown by the increased scores on the posttest, and better supports learners transitioning to dermatology residency, where dermatopathology constitutes a large part of the overall curriculum.[2] More comprehensive knowledge of dermatopathology early in dermatology training also may help to better prepare residents to accurately diagnose and manage dermatologic conditions.

Pretest scores showed that the average confidence rating in dermatopathology among participants in our lecture was 1.5, which is rather low. This is consistent with prior studies that have found that residents feel that medical school inadequately prepared them for dermatology residency.[7,8] More than 87% (71/81) of medical students surveyed felt they received inadequate general dermatology training in medical school.[9] This supports the proposed educational gap that is impacting confidence in overall dermatology knowledge, which includes dermatopathology. In our study, the average confidence rating increased by 1.1 points after the lecture, which was statistically significant ($P=.010$) and demonstrates that an introductory lecture serves as a feasible intervention to improve confidence in this area.

The feedback we received from participants in our lecture shows the benefits of an introductory interactive lecture with virtual dermatopathology images. Ngo et al[2] highlighted how residents perceive virtual images to be superior to conventional microscopy for dermatopathology, which we utilized in our lecture. This method is not only cost effective but also provides a simple way for learners and facilitators to point out key findings on histopathology slides.[2]

## Final Thoughts

Overall, implementing dermatopathology education early in training has a measurable impact on dermatopathology knowledge and confidence among medical students and first-year dermatology residents. An interactive lecture with virtual images similar to the one we describe here may better prepare learners for the transition to dermatology residency by addressing the educational gap in dermatopathology early in training.

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