BRIEF ARTICLES

Optimizing Medical Student Dermatology Education with the American Academy of Dermatology's Basic Dermatology Curriculum

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INTRODUCTION

Despite dermatologic conditions being among the most common complaints in primary care settings, medical schools dedicate an average of only 16 hours to dermatology education.[1] This time is predominantly devoted to didactic lectures during the preclinical years, as clinical dermatology rotations are required by less than 10% of schools. Minimal exposure to the field of dermatology leads to residents who lack the confidence to diagnose and treat dermatologic conditions. In a 2009 needs assessment to determine the adequacy of undergraduate dermatology clinical curricula, less than 40% of primary care residents indicated that their medical school curriculum prepared them to diagnose and treat common skin disorders.[2] This highlights the importance of efficient and effective dermatology learning experiences for students during their undergraduate medical education, especially during clinical rotations. On a clinical dermatology elective, students typically complete recommended textbook readings along with didactic lectures given by residents or faculty members. Adult learners, however, desire the ability to set the pace of their self-directed learning, and each newer generation of medical students is becoming more reliant on technology as an educational resource.[3] Medical schools and dermatology programs can accommodate these preferences by incorporating the American Academy of Dermatology's Basic Dermatology Curriculum into medical student education.

REVIEW

The American Academy of Dermatology (AAD) introduced its Basic Dermatology Curriculum to teach the core principles of dermatology in medical education.[4] The standardized online curriculum, designed by primary care and dermatology educators, is composed of 42 peer-reviewed modules and 7 instructional videos (Table 1). The morphology, clinical evaluation, and treatment of common skin diseases are highlighted using clinical case scenarios, and the learner's progress is tested at the conclusion of the module. Each module can be completed in less than 30 minutes at a learner's own pace. The modules can also be used as lectures or in small-group settings, and the curriculum offers example schedules for use during clinical rotations. The Basic Dermatology Curriculum can be accessed by creating a free user account through the AAD's website (https://www.aad.org/member/education/resi

dents/bdc). Unfortunately, the curriculum was never widely promoted and has been underutilized as a result, with many medical students and educators unaware of its existence.[5]

Several studies have assessed the use of the Basic Dermatology Curriculum by medical students and primary care residents. Researchers at UCSF piloted 18 of the modules during the development of the curriculum.[6] Fifty-one fourth-year medical students completing a two-week dermatology clerkship were assigned specific modules to complete each day. The students' knowledge acquisition was assessed with pre- and post-clerkship tests. All 51 students demonstrated statistically significant improvement in test scores, and the mean pre-clerkship score was 74.0% compared to the average post-clerkship score of 89.0% ($p < 0.01$).[6] On the post-clerkship survey, 95% of students found the modules easy to navigate, 94% said the material was clear, and 95% said the modules were engaging.[6] Students ranked the modules and clinic time (over textbook reading and lectures) as the most important aspects of their learning during the rotation. All of the students agreed that the modules increased their confidence in recognizing common skin disorders.

McCleskey evaluated the use of the AAD modules in 82 primary care learners completing a clinical dermatology rotation.[7] The modules were used in place of lectures during the rotation. Mean pre- and post-rotation test scores showed statistically significant improvement (60.1% vs. 77.4% ($p < 0.01$)).[7] Residents reported the online modules to be engaging (96%), clear (99%), and worth their time (97%), and they preferred the modules to other teaching methods.[7]

Researchers at UT Southwestern embedded the AAD modules within their medical student internal medicine clerkship.[8] The modules were utilized in a large-group, case-based interactive learning session where dermatology faculty reviewed images from the modules. After the clerkship, 98% of students agreed that the session was effective and that they had increased confidence in describing skin findings.[8]

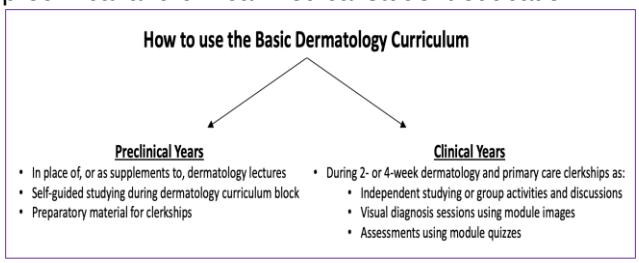
McMichael et al. employed an interactive, lecture-based curriculum adapted from the AAD modules to teach dermatology concepts to resident physicians in Somalia.[9] To assess the short-term impact of the curriculum on dermatology knowledge, the residents were given tests before and after the lectures composed of questions directly from the AAD modules. The scores showed a mean improvement of 27%.[9]

Although the studies involved small sample sizes without control groups, the results positively support the use of the Basic Dermatology Curriculum in medical education. The studies demonstrate the successful integration of an online, module-based educational platform into curricula in various fashions (Figure 1). The studies showed substantial knowledge acquisition of dermatology material in medical students and primary care residents, and the curriculum received overwhelming support from learners.

Table 1. List of American Academy of Dermatology's basic dermatology curriculum modules and instructional videos.

1. Acne and rosacea	25. How to perform a punch biopsy
	26. How to perform a scissor biopsy
2. Actinic keratosis and squamous cell carcinoma	27. How to perform a shave biopsy
3. Adult cutaneous fungal infections 1: Dermatophytes	28. How to perform an excisional biopsy
4. Adult cutaneous fungal infections 2: Yeasts	29. Infantile hemangiomas and vascular malformations
5. Advanced pediatric bacterial skin infections	30. Infestations and bites
6. Atopic dermatitis	31. KOH exam
7. Bacterial skin infections	32. Melanoma
8. Basal cell carcinoma	33. Molluscum contagiosum
9. Basic science of the skin	34. Morphology
10. Benign skin lesions	35. Newborn skin disease: birthmarks
11. Blisters	36. Newborn skin disease: rashes
12. Blotches: dark rashes	37. Pediatric fungal infections
13. Blotches: light rashes	38. Petechiae, purpura and vasculitis
14. Contact dermatitis	39. Psoriasis
15. Cryotherapy	40. Red scaly rash: The papulosquamous eruption
16. Cutaneous hypersensitivity reactions in children	41. Stasis dermatitis and leg ulcers
17. Dermatologic therapies	42. Sun protection
18. Dermatosis in pregnancy	43. The red face
19. Drug reactions	44. The red leg
20. Erythroderma	45. The skin exam
21. Evaluation of pigmented lesions	46. Total body skin exam
22. Genetic skin disorders	47. Urticaria
23. Hair loss	48. Viral exanthems
24. HIV dermatology	49. Warts

Figure 1. Examples of ways in which the basic dermatology curriculum can be incorporated into preclinical and clinical medical student education.



DISCUSSION

The Basic Dermatology Curriculum modules are a high-quality resource for educating medical students. The modules offer streamlined, basic information for students as they learn to describe skin lesions and generate diagnostic and treatment plans. Dermatology educators should consider introducing the modules to students during their preclinical education and employing the modules during clinical clerkships. The modules can be used as large-group lectures, in small-group activities, or to supplement lectures and direct independent learning. The ideal clinical dermatology clerkship curriculum likely contains elements of didactic lectures, textbook readings, and online modules in addition to the clinical experiences in the hospital and clinic settings. Hopefully, awareness of the AAD modules will increase as more dermatology programs incorporate them into medical school curricula in some manner.

In addition to increasing knowledge and utilization of the curriculum among medical students, the curriculum should be promoted among primary care residents and practicing physicians as well. Opportunities to advertise the curriculum, either through social media or at the meetings of professional associations like the ACP and AAFP, should be explored. In addition,

dermatology programs may encourage primary care residency program directors at their own institutions to incorporate the modules into their curricula. For practicing internists and pediatricians, CME credit can potentially be offered to increase utilization. Improving dermatology education during medical school and among these groups will ultimately lead to better care for patients from dermatologists and primary care physicians alike.

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