

Integration of Dermatology-Focused Physical Diagnosis Rounds and Case-Based Learning Within the Internal Medicine Medical Student Clerkship

Brian L. Scott¹, Blake Barker², Reeni Abraham² and Heather W. Wickless³

¹Fourth Year Medical Student, University of Texas Southwestern Medical Center, Dallas, TX, USA. ²Assistant Professor of Internal Medicine, University of Texas Southwestern Medical Center, Dallas, TX, USA. ³Assistant Professor of Dermatology, University of Texas Southwestern Medical Center, Dallas, TX, USA.

ABSTRACT

BACKGROUND: Over half of dermatologic conditions are seen by nondermatologists, yet medical students receive little dermatology education. Medical students in the clinical years of training at our institution felt insecure in their physical diagnosis skills for dermatologic conditions.

OBJECTIVE: The objective of this study was to implement dermatology-focused curricula within the Internal Medicine (IM) Core Clerkship to increase student confidence in diagnosing skin diseases.

METHODS: Two dermatology-focused sessions were integrated into the IM Clerkship. A faculty dermatologist leads students on a dermatology-focused physical diagnosis “Skin Rounds”, where patients are seen at the bedside and students practice describing skin lesions and forming a differential diagnosis. Students also participate in a case-based active learning session. A dermatologist selects images of common skin conditions that students describe utilizing appropriate terminology and offer a differential diagnosis. The impact of these sessions was assessed through survey-based student feedback and by comparing the results from the IM Shelf Exam before and after intervention.

RESULTS: A total of 74 students completed the skin rounds survey (32% response rate). About 99% ($n = 73$) of students felt that skin rounds were effective and useful, and 92% ($n = 68$) of students reported that they felt more confident in describing skin lesions afterward. A total of 43 students completed the case-based learning session survey (37% response rate), and 98% ($n = 42$) of students strongly agreed or agreed that the session was effective and useful. Performance on the dermatologic questions of the IM Shelf Exam was analyzed. While not statistically significant at $P < 0.05$, students improved from an average of 77% correct responses before intervention to 79% afterward ($P = 0.60$).

CONCLUSIONS: Our case-based and bedside teaching interventions were met with high satisfaction from medical students and increased their confidence in describing skin lesions. This intervention can serve as a model to improve dermatology education and can be adapted to utilize the IM clerkship to address curriculum inadequacies at other institutions.

KEYWORDS: case-based learning, dermatology teaching, internal medicine clerkship, physical diagnosis, skin examination

CITATION: Scott et al. Integration of Dermatology-Focused Physical Diagnosis Rounds and Case-Based Learning Within the Internal Medicine Medical Student Clerkship. *Journal of Medical Education and Curricular Development* 2016;3:105–107 doi:10.4137/JMECD.S40417.

TYPE: Original Research

RECEIVED: June 21, 2016. **RESUBMITTED:** August 4, 2016. **ACCEPTED FOR PUBLICATION:** August 6, 2016.

ACADEMIC EDITOR: Steven R. Myers, Editor in Chief

PEER REVIEW: Three peer reviewers contributed to the peer review report. Reviewers' reports totaled 438 words, excluding any confidential comments to the academic editor.

FUNDING: Authors disclose no external funding sources.

COMPETING INTERESTS: Authors disclose no potential conflicts of interest.

COPYRIGHT: © the authors, publisher and licensee Libertas Academica Limited. This is an open-access article distributed under the terms of the Creative Commons CC-BY-NC 3.0 License.

CORRESPONDENCE: heather.wickless@utsouthwestern.edu

Paper subject to independent expert single-blind peer review. All editorial decisions made by independent academic editor. Upon submission manuscript was subject to anti-plagiarism scanning. Prior to publication all authors have given signed confirmation of agreement to article publication and compliance with all applicable ethical and legal requirements, including the accuracy of author and contributor information, disclosure of competing interests and funding sources, compliance with ethical requirements relating to human and animal study participants, and compliance with any copyright requirements of third parties. This journal is a member of the Committee on Publication Ethics (COPE).

Published by Libertas Academica. Learn more about this journal.

Introduction

Dermatologic conditions are extremely common; they are the primary diagnosis in 9% of all physician visits in the United States. Around 60% of these visits for skin conditions are seen by nondermatologists, and 5% of patient visits to internists include cutaneous issue as the primary complaint.¹ Despite the prevalence of these conditions, medical students in the United States receive only a median of 10 hours of formal dermatology education.²

Medical students at our institution received no formal universal teaching regarding dermatologic physical diagnosis during the clinical training years of medical school prior to 2014. Through informal feedback, students expressed a lack of comfort with basic physical diagnosis skills for dermatologic conditions. Our objective was to implement

dermatology-focused curricula within the Internal Medicine (IM) Core Clerkship after which students should be able to perform the following tasks adapted from the American Academy of Dermatology (AAD) Basic Dermatology Curriculum: (1) develop a systematic approach to skin examination; (2) effectively communicate a description of common skin conditions using appropriate dermatologic terms; and (3) develop a differential diagnosis for common dermatologic manifestations.³

Methods

In the 2014–2015 academic year, two new dermatology-focused sessions were integrated into the IM Core Clerkship. All students are exposed once to each session. Each week, a faculty dermatologist leads five students on “Skin Rounds”,



a one-hour dermatology-focused physical diagnosis rounds session. Patients are identified by the inpatient dermatology consult service or by the medical students from their general medicine inpatient service. Students are brought to the bedside where they are asked to describe skin findings using proper dermatologic terminology (papule, plaque, vesicle, etc.) and form a differential diagnosis with assistance from the dermatologist. Common findings that are demonstrated on these rounds include palpable purpura, maculopapular exanthems, nail dystrophy, scaly plaques, genital vesicles, verruciform papules, erythroderma, and bullous eruptions.

Students also participate in a large group, 1.5-hour case-based active learning session on common dermatologic findings called “Dermatology: What’s Your Diagnosis?” A faculty dermatologist reviews 20 high-definition images of common dermatologic conditions drawn from the AAD Basic Dermatology Curriculum with a group of 20–25 students. For each slide, one student is asked to describe the condition utilizing appropriate terminology and offer a differential diagnosis with assistance from the dermatologist.

The impact of these sessions was assessed through online survey student feedback and standardized test performance. The skin rounds survey was distributed to all students at the completion of their IM rotation between June 2014 and December 2015 and included two questions regarding the sessions. The survey asked students to utilize a 5-point Likert scale (strongly agree to strongly disagree) to indicate: (1) whether skin rounds increased their confidence in describing skin lesions and (2) whether skin rounds was an effective and useful teaching session. Two questions were added to the survey during the second half of the 2015 academic year to assess the case-based active learning session. Students were asked: (1) whether the case-based learning session was effective and useful and (2) whether the case-based learning session improved student ability to work in a team.

Medical student performance within the “Diseases of Skin and the Nervous and Musculoskeletal Systems” content area of the National Board of Medical Examiners (NBME) Internal Medicine Subject Examination (IM Clerkship Shelf Exam) was also analyzed before (2013–2014) and after (2014–2015) implementation of the dermatology teaching sessions. Specifically, we analyzed the percent of items within this content area that were answered correctly prior to and after intervention using an independent samples *z*-test with significance set at $P < 0.05$.

Our study was reviewed by the University of Texas Southwestern Institutional Review Board (IRB) and determined to be an education improvement activity not requiring IRB oversight. This research complied with all ethical principles established in the Declaration of Helsinki.

Results

The skin rounds survey was distributed to all 345 students who completed the IM rotation between June 2014 and

Table 1. Comparison of medicine subject examination before and after intervention.

	2013–2014	2014–2015	P-VALUE
Number of examinees	240	230	
All dermatology questions—our institution	0.77	0.79	0.60
All dermatology questions—national	0.68	0.66	0.51
All dermatology questions—(our institution—national)	0.10	0.12	0.55
Total test mean—our institution (standard deviation)	81.5 (8.3)	82.5 (7.9)	0.18

December 2015. A total of 169 students completed the survey (49% response rate); 94% ($n = 159$) of them agreed or strongly agreed that skin rounds was effective and useful. About 89% ($n = 150$) of students agreed or strongly agreed that skin rounds made them more confident in describing skin lesions. Fourteen students commented that they would like more of these sessions.

The case-based learning survey questions were distributed to all 115 students who completed the IM clerkship between January and June 2015. A total of 43 students completed the survey (37% response rate), and 98% ($n = 42$) of them strongly agreed or agreed that the case-based learning session was effective and useful. About 88% ($n = 38$) of students strongly agreed or agreed that the activity improved their ability to work in a team.

Medical student performance on the Diseases of Skin and the Nervous and Musculoskeletal Systems portion of the IM Shelf Exam before (2013–2014) and after (2014–2015) intervention is depicted in Table 1. While not statistically significant at $P < 0.05$, students improved from an average of 77% of questions answered correctly before intervention to 79% afterward ($P = 0.60$). This increase was seen despite a national decrease from 68% to 66% over the same time frame ($P = 0.51$). There was a 1-point increase in total test mean score after the intervention; this increase also lacked statistical significance ($P = 0.18$).

Discussion

Due to the frequency of skin-related issues that present to nondermatologists, all future physicians need a strong foundation in the recognition of skin diseases. One recent study found that U.S. medical students in their final year of education were dissatisfied with their dermatology training and were able to correctly diagnose only less than 50% of common dermatologic conditions.⁴ Likewise, primary care physicians may accurately diagnose skin lesions only 34%–50% of the time.^{5,6} In the hospital setting, a dermatology consult for a cutaneous issue changes the diagnosis or treatment offered by the primary team in 60%–77% of patients.^{7,8} In its current state, medical education is not adequately preparing medical



trainees to properly diagnose or manage dermatologic diseases. Improving dermatology training has the potential to improve the care of patients across multiple disciplines of medicine; cutaneous findings are often important clues to an underlying systemic disease.

Our intervention was designed to address inadequacies in medical student dermatologic education by embedding activities within the IM clerkship. Our intervention was met with high satisfaction from medical students, and they reported increased confidence in describing skin lesions. We utilized bedside teaching and case-based active learning, which have been found to be superior to lectures at increasing medical student confidence in their ability to diagnose dermatologic diseases.⁹ These sessions may also have been successful since they were led by a faculty dermatologist, which has been shown to be superior at increasing diagnostic self-confidence relative to training from a primary care physician.⁹

In addition to self-reported increases in diagnostic ability, we observed a trend toward improvement in the dermatology questions on a national examination, although this lacked statistical significance. Unfortunately, the NBME combines the test content results of skin, nervous, and musculoskeletal systems. This combined reporting does not allow for assessing performance on dermatology content in isolation. Additionally, the test results reflect a limited number of dermatology-related questions on the national examination; between 5% and 10% of the 100 board questions pertain to the skin and subcutaneous tissues.¹⁰ The small number of test questions analyzed might lack sufficient statistical power to detect meaningful differences. A focused examination with a greater number of dermatologic questions would provide a better objective assessment of the effectiveness of our intervention. Finally, the success of this intervention depends on the quality and commitment of a faculty dermatologist to medical student education; results might vary depending on which faculty proctors the skin rounds and case-based learning. Given the limitations of our study, our results may be best viewed as pilot data that may be used to formulate larger and more rigorous scholarly projects.

Nevertheless, these findings have important implications; case-based and bedside teaching utilizing real patients with skin findings improves medical students' confidence in approaching a dermatologic patient. These interventions require only a collection of photographs and a time investment from a faculty dermatologist, making them a highly practical way to improve medical student dermatologic education.

This intervention has applicability beyond dermatology; physical diagnosis rounds and case-based learning can be utilized to teach any organ system. We hope that this intervention can serve as a model that can be easily adapted to the needs of each specific teaching institution.

Acknowledgment

The abstract of this paper was delivered as a poster presentation at the 2016 Society of General Internal Medicine Annual Meeting and subsequently published in "Abstracts from the 2016 Society of General Internal Medicine Annual Meeting" in the *Journal of General Internal Medicine* (PMID: 27114361).

Author Contributions

Conceived and designed the experiments: BS, HW. Analyzed the data: BS, RA. Wrote the first draft of the manuscript: BS. Contributed to the writing of the manuscript: BS, RA, BB, HW. Agree with manuscript results and conclusions: BS, RA, BB, HW. Jointly developed the structure and arguments for the paper: BS, HW. Made critical revisions and approved final version: BS, RA, BB, HW. All authors reviewed and approved of the final manuscript.

REFERENCES

1. Feldman SR, Fleischer AB Jr, McConnell RC. Most common dermatologic problems identified by internists, 1990–1994. *Arch Intern Med*. 1998;158(7):726–730.
2. McCleskey PE, Gilson RT, DeVillez RL. Medical student core curriculum in dermatology survey. *J Am Acad Dermatol*. 2009;61(1):30.e–35.e.
3. American Academy of Dermatology. Educator's Guide for Teachers. 2015. <https://www.aad.org/education/basic-derm-curriculum/teaching-and-learning-guides/educator-s-guide>. Accessed December 28, 2015.
4. Ulman CA, Binder SB, Borges NJ. Assessment of medical students' proficiency in dermatology: are medical students adequately prepared to diagnose and treat common dermatologic conditions in the United States? *J Educ Eval Health Prof*. 2015;12:18.
5. Sellheyer K, Bergfeld WF. A retrospective biopsy study of the clinical diagnostic accuracy of common skin diseases by different specialties compared with dermatology. *J Am Acad Dermatol*. 2005;52(5):823–830.
6. Kirsner RS, Federman DG. Lack of correlation between internists' ability in dermatology and their patterns of treating patients with skin disease. *Arch Dermatol*. 1996;132(9):1043–1046.
7. Falanga V, Schachner LA, Rae V, et al. Dermatologic consultations in the hospital setting. *Arch Dermatol*. 1994;130(8):1022–1025.
8. Davila M, Christenson LJ, Sontheimer RD. Epidemiology and outcomes of dermatology in-patient consultations in a Midwestern U.S. University Hospital. *Dermatol Online J*. 2010;16(2):12.
9. Chiang YZ, Tan KT, Chiang YN, Burge SM, Griffiths CE, Verbov JL. Evaluation of educational methods in dermatology and confidence levels: a national survey of UK medical students. *Int J Dermatol*. 2011;50(2):198–202.
10. National Board of Medical Examiners. Clinical Science Medicine Content Outline. 2015. http://www.nbme.org/Schools/Subject-Exams/Subjects/clinicalsci_med.html. Accessed January 16, 2015.