

# Dermatology Medical Education: A Multicenter Survey Study of the Undergraduate Perspective of the Dermatology Clinical Clerkship

Parastoo Davari<sup>1</sup> MD, Jillian W Millsop<sup>1</sup> MD MS, Mary Ann N Johnson<sup>1</sup> MD, Stefani R Takahashi<sup>2</sup> MD, David H Peng<sup>2</sup> MD, Joanna Badger<sup>3</sup> MD, Brooks A Bahr<sup>4</sup> MD, Kanade Shinkai<sup>5</sup> MD PhD, Chin-Shang Li<sup>6</sup> PhD, and Nasim Fazel<sup>1</sup> MD DDS

Affiliations: <sup>1</sup>University of California, Davis, Department of Dermatology, Sacramento, California, <sup>2</sup>Keck School of Medicine of USC, Department of Dermatology, Los Angeles, California, <sup>3</sup>Stanford School of Medicine, Department of Dermatology, Redwood City, California, <sup>4</sup>University of Utah Health Care, Department of Dermatology, Salt Lake City, Utah, <sup>5</sup>University of California, San Francisco, Department of Dermatology, San Francisco, California, <sup>6</sup>University of California, Davis, Department of Public Health Sciences, Division of Biostatistics, Davis, California

Corresponding Author: Nasim Fazel MD, DDS, University of California, Davis, Department of Dermatology, 3301 C Street, Suite 1400, Sacramento, CA 95816, Email: nfazel@ucdavis.edu

## Abstract

**Background/Aims:** Limited data are available regarding the undergraduate dermatology clinical clerkship curriculum in the United States. Our primary aim is to assess medical students' perspectives of the dermatology clinical clerkship.

**Methods:** A multicenter survey study was conducted, which included four California dermatology academic programs. A 17-item questionnaire was designed to investigate medical student perception with regard to the overall educational value of the various teaching aspects of the dermatology clinical clerkship.

**Results:** A total of 152 medical student surveys were completed. Over half of the medical students felt proficient in diagnosing the most common dermatologic conditions. Eighty-seven percent of medical students were very satisfied with the dermatology clerkship. Ninety-one percent of students felt the length of the clerkship was appropriate.

**Conclusions:** The vast majority of medical students reported a high level of proficiency in the treatment and diagnosis of common skin disorders. In contrast, our findings suggest that medical students may not be gaining sufficient hands-on experience in conducting certain dermatologic procedures following the dermatology clerkship. Overall, medical student perception of the dermatology clinical clerkship was mostly positive.

**Keywords:** Medical, education, dermatology, clerkship, curriculum, medical students, undergraduate

## Introduction

In the past few decades, previously published studies have shown a decline in the amount of time devoted to undergraduate dermatology training in U.S. medical schools [1-3]. The dermatology clinical clerkship provides a learning opportunity for medical students in training to enhance their knowledge and skills of the specialty. Feedback from medical students in an effort to identify and better delineate their needs and to gain a meaningful understanding of their perception of how the clinical clerkship may be more useful educationally and can be invaluable to optimize their learning experience. To the best of our knowledge, this is the first multi-center survey study conducted in the U.S. investigating medical student perception of the various educational aspects of the dermatology clinical clerkship.

## Methods

A multicenter survey study was conducted at four academic dermatology programs; University of California, Davis (UCD), University of California, San Francisco (UCSF), Stanford University, and University of Southern California (USC). Participants for the study included enrolled and visiting third and fourth-year medical students. Medical students were asked to

**Table 1. Summary of intentions on selection of specialty**

Specialty	Frequency
Dermatology	67
Internal Medicine	26
Pediatrics	14
Family Medicine	12
OB/GYN	8
Multiple specialties	6
Neurology	3
ER	2
Surgery subspecialty (Plastics, ENT, Urology)	2
Psychiatry	2
Anesthesiology	1
Ophthalmology	1
Pathology	1
Surgery (General)	1
Undecided	1
N/A	5

perception of the quality of hands-on teaching in clinic (faculty versus resident) was assessed. Additionally, we inquired about their perceived proficiency in the diagnosis and treatment of common dermatologic diseases and conducting common dermatologic procedures.

Finally, medical students were asked about their overall satisfaction with the dermatology clerkship. Answers were based on a Likert scale ranging from 0 to 5 (i.e. 0= no value to 5= very valuable, 0 = not proficient to 5 = very proficient). Data were tabulated and compiled from the multiple sites into Microsoft Excel. Chi-square was used to test the equal distribution of a categorical variable. A P-value < 0.05 was considered statistically significant. All analyses were performed with SAS 9.4 (SAS Institute Inc., Cary, NC, USA).

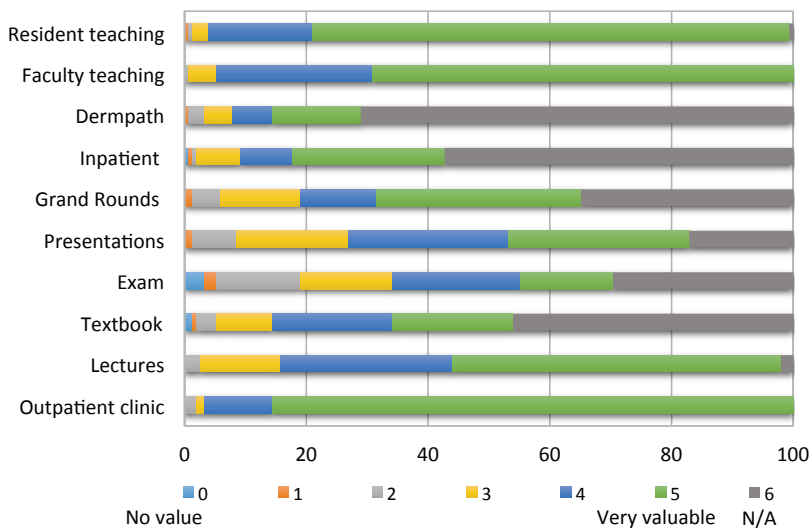
## Results

One hundred and fifty-two medical students (n=152) at the four academic centers completed the survey questionnaire. The average length of the dermatology clinical clerkship was 3.8 weeks. Ninety-one percent of medical students commented that the length of their dermatology rotation was appropriate. Fifty-eight percent of medical students were very satisfied with their experience during the clerkship. All findings were statistically significant (P<0.001).

**Table 1** summarizes the specific specialty to which the medical students were applying, which included dermatology, primary care, surgical specialties, and other medical specialties. Eight-six percent of medical students reported that the dermatology clinical clerkship may be very useful for their future residency training. Data regarding the educational value of the various learning settings of the dermatology clinical clerkship are summarized in **Figure 1**. The majority of medical students found the educational value of the outpatient clinic (85%), resident teaching (78%), faculty teaching (69%), and didactic lectures (54%) to be "very valuable." Seventy-one percent of medical students did not have any exposure to dermatopathology during the dermatology clerkship. All findings were statistically significant (P<0.001). Clerkship sites consisted of the

complete a 17-item questionnaire upon completion of the dermatology clerkship. All students completing the dermatology clinical clerkship were eligible to participate. Approval from the IRB Human Research Committees at each of the study sites were obtained to conduct this study.

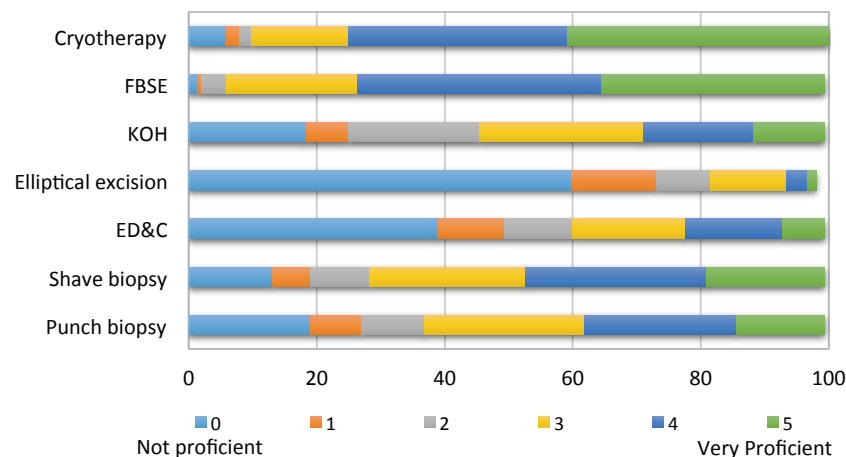
A 17-item questionnaire was designed to investigate medical student perception with regard to the overall educational value of the various teaching aspects of the dermatology clinical clerkship. Content areas include the specialty to which the student is applying and the length of the dermatology clerkship. Medical students were asked to rate the educational value of the various learning aspects of the clerkship, including didactic lectures, textbook review, exams, student presentations, grand rounds, inpatient rounds, and dermatopathology slide review. They were also asked to evaluate the educational value of the different clerkship sites including the Veterans Affairs (VA) hospital, community hospitals, county hospitals, outpatient clinic, and private practice. The



**Figure 1.** Perceived educational value of the various learning settings. \*P < 0.0001; n = 152

university-based hospital, county hospital, VA, private practice, children’s hospital, community hospital, and HMO practice (i.e. Kaiser). The highest rated clerkship sites with a rating of 4 or 5 were the VA (65%), university-based hospital (55%), and county hospital (51%). The educational value of these sites is summarized in **Figure 2**. All findings were statistically significant (P<0.001)

Data regarding the perceived proficiency of conducting common dermatologic procedures are presented in **Figure 3**. Most medical students reported a high-level of proficiency (4 or 5) conducting a full body skin exam (73%) and cryotherapy (75%). Only half of the medical students reported a proficiency level of 4 or 5 in conducting shave biopsies (47%) and



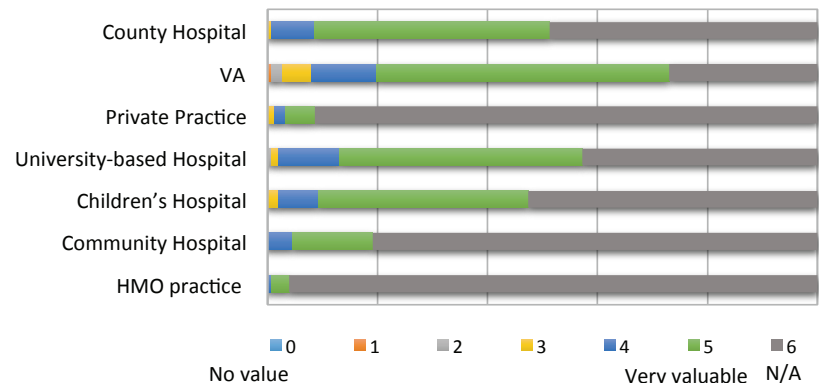
**Figure 3.** Perceived proficiency in conducting common dermatologic procedures. \*P < 0.0001; n = 152

approximately one-third in conducting KOH preparations (28%) and punch biopsies (37%). Few medical students reported proficiency in conducting elliptical excisions (5%) and electrodesiccation and curettage (21%). All findings were statistically significant (P<0.001).

The vast majority of medical students reported a high level of proficiency (4 or 5) in the diagnosis and treatment of atopic dermatitis, psoriasis, contact dermatitis, warts, seborrheic keratosis, rosacea, molluscum, seborrheic dermatitis, and tinea infections (**Figures 4, 5**). Students felt less proficient with the diagnosis and treatment of drug eruptions and lupus.

### Conclusion

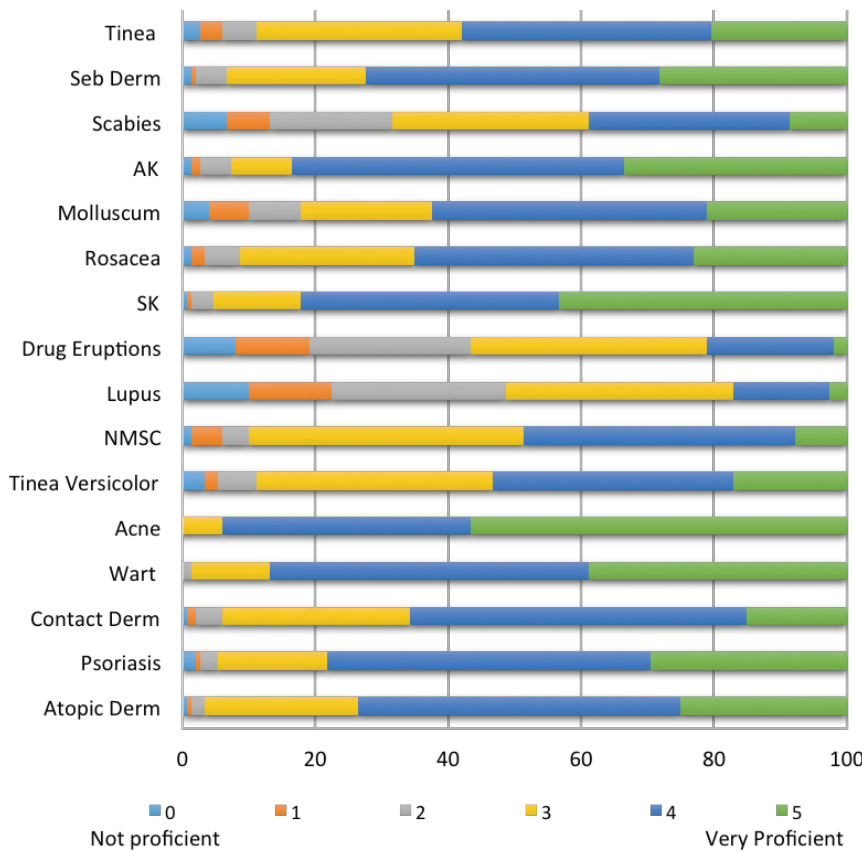
Studies have shown that primary care providers are responsible for the majority of care



**Figure 2.** Perceived educational value of the clerkship sites.

for dermatologic disease [4, 5]. However, little time is devoted to dermatology education in medical school curricula and few medical schools require dermatology training [2]. Insufficient training may result in repeated diagnostic error, mismanagement of dermatologic disease by primary care physicians and unnecessary referrals [6, 7].

The aim of the present study was to evaluate medical student perspectives regarding the educational value of the dermatology clinical clerkship. We sought to investigate the medical students’ perspective of the value of various learning settings and teaching sites. Additionally, we investigated



**Figure 4.** Perceived proficiency regarding diagnosis of common dermatologic diseases.

perceived competence acquired in the diagnosis and treatment of common dermatologic skin diseases following the clerkship. Limitations of the study include the small number of dermatology programs participating in the study, which may not necessarily be generalizable to all programs, and the small number of students surveyed.

Several interesting observations were made from the data. The most valued educational setting was the VA followed by university-based hospital, county hospital, and children’s hospital settings. We found that medical students overall were very satisfied with the dermatology clerkship. The educational value of the outpatient clinic experience and both resident and faculty lectures were highly rated. Following completion of the clerkship, medical students felt adept in the diagnosis and treatment of common dermatologic diseases. However, medical students reported a lack of proficiency in conducting minor dermatologic procedures (i.e. KOH, shave and punch biopsies) following the dermatology clerkship. Of the dermatologic conditions that were included in the survey, medical students felt the least proficient with

diagnosing and treating lupus and drug eruptions.

The following are recommendations for dermatology programs to consider regarding the various teaching aspects of the clinical clerkship based on our data:

1. Include a rotation in the VA setting as part of the dermatology clinical clerkship, if the option is available.

2. Encourage active participation in dermatology procedures including the hands-on basic skills of shave and punch biopsy techniques. This can be particularly helpful to students applying to primary care who have limited exposure to dermatology.

3. Consider needs assessment for dermatology curriculum development. Surveys to primary care physicians and residents can be sent to assess the gaps in knowledge and their level of competence in managing various dermatologic conditions, which can be incorporated into the medical student curriculum. The Spanish Academy of Dermatology and Venereology recently outlined core content for undergraduate education in dermatology by surveying members of their instructors’ group and applying the Delphi method [8].

4. Include the diagnosis and management of lupus and drug eruptions in the medical student curriculum.

This study stimulates questions regarding how to improve the educational value of the dermatology clinical clerkship by broadening the exposure to cases, and including more hands-on instruction on procedures in a limited period of time. For instance, it would be interesting to evaluate the use of online resources to supplement the education of medical students for which they may not have adequate exposure. An online tutorial on how to perform biopsies or KOH preparation could be a useful adjunctive educational tool, if medical students feel less proficient with these procedures. Such modules could be formatted similar to those already available

at the American Academy of Dermatology (AAD) basic dermatology curriculum: <https://www.aad.org/education/basic-derm-curriculum>. A study demonstrated that the use of the online AAD tool was preferred over traditional textbooks and lectures, and knowledge acquisition measured by pre- and post-test scores were improved [9].

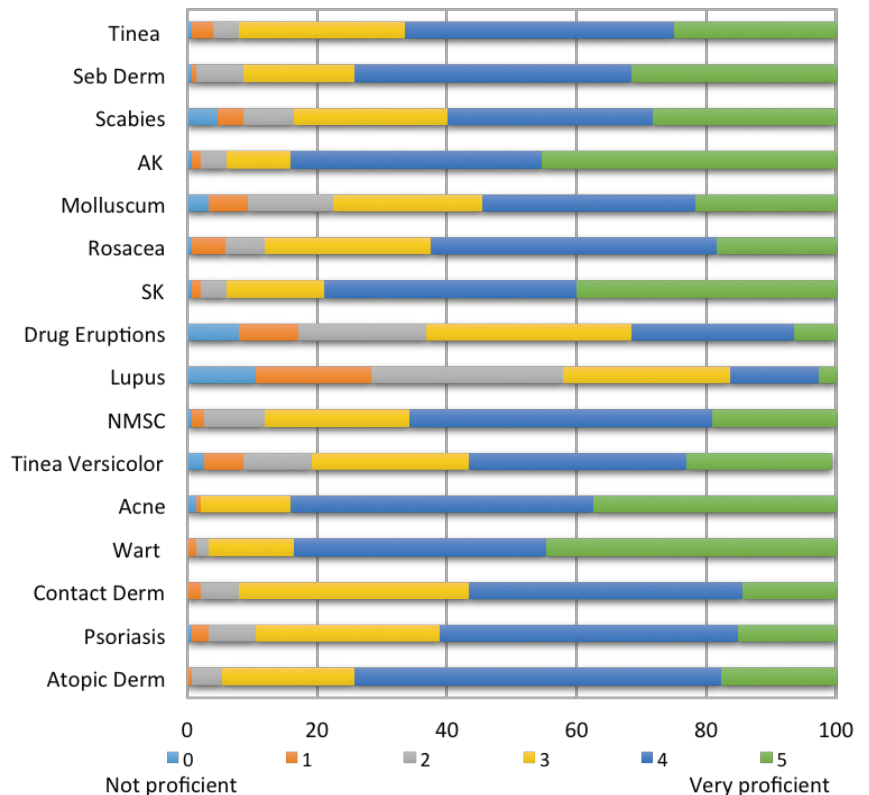
Exposure to teledermatology could also be considered to gain more exposure to dermatologic diagnoses in a limited period of time. Teledermatology was viewed as a valuable educational tool for both dermatology residents and medical students at the VA in Denver [10]. Both the e-learning and teledermatology format may provide students access to images of dermatologic conditions to which they may not otherwise have exposure to in the traditional clinic setting. This may be perhaps another reason for incorporating a rotation in the VA clinic as part of the clinical clerkship given the high volume of cases. Larger scale studies are necessary to fully evaluate all aspects of the dermatology clinical clerkship. Follow up studies may be useful to further evaluate the diagnostic and treatment accuracy of medical students following the dermatology clinical clerkship. In addition, a longitudinal post-graduate survey study evaluating the diagnostic and treatment accuracy of primary care physicians comparing those who have and have not participated in a dermatology clinical clerkship during medical school would be of interest.

### Abbreviations

United States, U.S.; University of California, Davis, UCD; University of California, San Francisco, UCSF; University of Southern California, USC; Veterans Affairs, VA; health maintenance organization, HMO; potassium hydroxide, KOH; American Academy of Dermatology, AAD.

### References

1. Knable A, Hood AF, Pearson TG. Undergraduate medical education in dermatology: report from the AAD Interdisciplinary Education Committee, Subcommittee on Undergraduate Medical Education. *J Am Acad Dermatol.* 1997;36(3 Pt 1):467-70. [PMID: 9091481].
2. McCleskey PE, Gilson RT, DeVillez RL. Medical Student Core Curriculum in Dermatology Survey. *J Am Acad Dermatol.*



**Figure 5.** Perceived proficiency regarding treatment of common dermatologic diseases. \* $P < 0.0001$ ;  $n = 152$

3. Ramsay DL, Mayer F. National survey of undergraduate dermatologic medical education. *Arch Dermatol.* 1985;121(12):1529-30. [PMID: 4062334].
4. Hansra NK, O'Sullivan P, Chen CL, Berger TG. Medical school dermatology curriculum: are we adequately preparing primary care physicians? *J Am Acad Dermatol.* 2009;61(1):23-9 e1. [PMID: 19409656].
5. Pariser RJ, Pariser DM. Primary care physicians' errors in handling cutaneous disorders. A prospective survey. *J Am Acad Dermatol.* 1987;17(2 Pt 1):239-45. [PMID: 3624563].
6. Ramsay DL, Fox AB. The ability of primary care physicians to recognize the common dermatoses. *Arch Dermatol.* 1981;117(10):620-2. [PMID: 7283454].
7. McCarthy GM, Lamb GC, Russell TJ, Young MJ. Primary care-based dermatology practice: internists need more training. *J Gen Intern Med.* 1991;6(1):52-6. [PMID: 1999747].
8. Casanova JM, Pujol RM, Ferrandiz C, Betlloch I, Bosch RJ, Fernandez V, Marti RM, Requena L, Moreno JC, Alegre V, Vilata JJ, Vilar N, Jaen P, Bielsa I, Querol I, Azon T, Borrego L, Mascaro JM, Alsina M, Diaz RM, Suarez R, Garcia-Bustinduy M, Garcia-Patos V, Estrach T, grupo de profesores y docentes de la A. Core Content for Undergraduate Medical Education in Spain: Recommendations of the Instructors' Group of the Spanish Academy of Dermatology and Venereology (AEDV). *Actas Dermosifiliogr.* 2016;107(2):125-32. [PMID: 26691244].
9. McCleskey PE. Clinic teaching made easy: a prospective study of the American Academy of Dermatology core curriculum in primary care learners. *J Am Acad Dermatol.* 2013;69(2):273-9. [PMID: 23415684].
10. Boyers LN, Schultz A, Baceviciene R, Blaney S, Marvi N, Dellavalle RP, Dunnick CA. Teledermatology as an educational tool for teaching dermatology to residents and medical students. *Telemed J E Health.* 2015;21(4):312-4. [PMID: 25635528].