

# Dermatology Resident Generated Textbook Questions as a Resident-Centered Educational Strategy

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## ABSTRACT

**Background:** Textbook conferences are widely used by dermatology residency programs in the United States to provide educational exposure to the specialty. Typically an entire textbook is reviewed each academic year. However, residents may be uncertain about mastery of the assigned readings. Since most dermatology textbooks do not provide questions about the material presented at the end of each chapter, an innovative senior resident from our program wrote questions about each chapter and offered them to the other residents prior to scheduled discussions of the assigned materials. **Methods:** A pilot study for resident generated quizzes about assigned textbook reading in general dermatology was developed, implemented, and assessed by anonymous completion of a Likert Scale by participants. **Results:** Participants indicated that quizzes better prepared them for the annual dermatology in-service examination and they thought that the additional creation of quiz materials in the subspecialty areas of dermatopathology and dermatologic surgery would be useful. **Conclusion:** Resident generated quizzes are a novel approach to the learning environment during dermatology residency for residency programs and may be useful for other residency programs that utilize textbook conferences. Additional research is needed.

Keywords: Dermatology; Residency; Accreditation; Self-Assessment; Textbook; Quiz

## **1. Introduction**

Learning in medical education is assessed by many different tools. Each modality facilitates learners' ability to obtain, process, and understand materials provided. According to the Accreditation Council for Graduate Medical Education (ACGME) requirements (IV.A.5.b). (3) for dermatology, residents "...should be trained, throughout the residency, with a various combinations of lectures, conferences, seminars, demonstrations, individual or group study of color transparencies or images and histological slides, clinical rounds, chart and record reviews, faculty-trainee sessions in small groups and one-to-one settings, book and journal reviews..." [1]. While much resident training occurs in the clinical setting, textbook reading remains an essential part of medical education for many dermatology programs. However, since it is recognized that physicians have a limited ability to accurately self-assess [2], it would be useful for them to have objective self-assessment tools available to measure learning. Self-assessment of learning has been studied in other

contexts. Al-Kadri *et al.* found that feedback from others was an essential element of self-assessment for medical students [3]. In another study, psychology students who created at least three questions about course work improved their exam scores [4].

## 2. Background

Simply reading a text may make it difficult for participants to assess their level of competency. While some board review materials used in preparation for the comprehensive certification examination administered annually by the American Board of Dermatology provide a question bank for self-assessment, few textbooks offer similar chapter review questions to assess comprehension. Our objective was to create a self-assessment tool that dermatology residents might use as a means of testing their understanding of the material read in each chapter.

## 3. Materials and Methods

In accordance with ACGME guidelines, each academic

year all dermatology residents in our program complete reading assignments. These readings include various aspects of clinical dermatology, pediatric dermatology, dermatopathology, and dermatologic surgery. Reading schedules are determined annually by the chief dermatology residents with approval by the program director. The reading requirements are typically completed in a six to eight month time course each year. Internal departmental educational activities are exempted from Institutional Review Board review.

For the academic year of 2011-2012, Andrews' Diseases of the Skin: Clinical Dermatology, tenth edition, was chosen as the clinical dermatology text for our 9 resident program. This 38 chapter text was divided into 23 reading assignments. Prior to each review conference, residents were expected to have read the assigned chapters. In order to enhance resident understanding and comprehension of each reading assignment, a written quiz was implemented. Prior to the group discussion, a selfassessment quiz consisting of 17 - 33 questions (closedbook format) was given to each resident except for the chief resident who created the quiz (NAD). Question types consisted of multiple choice, fill-in-the-blanks, true/false, and matching. Following quiz completion, answer sheets were distributed and the reading assignment was summarized by a chief resident. Emphasis was placed on key concepts from the chapter. Faculty members were present for additional commentary.

At the completion of our annual textbook reading, each resident was asked to complete an anonymous evaluation regarding their educational experience in this activity. The evaluation consisted of seven statements that residents rated using a five-point Likert Scale (**Table 1**). A score of 1 represented "completely disagree" and a score of 5 represented "completely agree". In addition, there was a question to assess what quiz format was preferred. Resident comments were also solicited about their learning experience during this process.

#### 4. Results

All eight dermatology residents completed the 23 session reading schedule and weekly quizzes. Evaluations were collected from all residents except the chief resident who created the quizzes, and are summarized in **Table 1**. All residents preferred a combination of multiple choice, fillin-the-blanks, true/false, and matching. Residents favored creation of additional quiz materials for the subspecialty areas of dermatopathology and dermatologic surgery. Resident qualitative comments reflected interest in additional multiple choice questions about the reading material, possibly reflecting the format of the annual dermatology in-training examination. The resident who created the questions (NAD) thought that this process increased his comprehension of the reading materials.

#### 5. Conclusions

Learning occurs in a variety of ways. A particular challenge for dermatology residents is the huge body of knowledge they are expected to master during the threeyear programs. At our institution, didactic teaching is done through a variety of modalities. These include textbook conferences, grand rounds, lectures, dermatopathology unknown slide conferences, kodachrome conferences, board review, journal club, and interdisciplinary conferences. In addition to these scheduled group activities, assigned textbook reading is an integral part of residency training. Through the use of quizzes, residents were provided with immediate feedback about their recall of the assigned reading.

Previous research supports the educational utility of providing quiz materials to residents, although the optimal use of quizzes in this setting requires further investigation. Neurology residents scored significantly higher on neuroanatomy that was tested on their residency inservice training examination (RITE) when they participated in team based oral quizzes [5]. However, written

Statement	Not Applicable	"1 - 3" Likert Responses	"4" Likert Responses	"5" Likert Responses	Mean Likert Score
My knowledge of clinical dermatology has improved	0	0	1	7	4.9
I feel better prepared for the Dermatology In-Training Exam this year	3	0	1	4	4.8
I am likely to use these questions to complement my studying for the In-Training Exam	0	0	2	6	4.8
I am likely to use these questions next year to supplement our clinical dermatology reading	2	0	0	6	5
I think questions that correlate to our dermatopathology reading would be helpful	0	0	2	6	4.8
I think questions that correlate to our dermatologic surgery reading would be helpful	0	0	1	7	4.9
Overall, the weekly questions related to our clinical dermatology reading was a good experience	0	0	0	8	5

Table 1. Dermatology resident evaluation (five-point Likert Scale).

1 = completely disagree, 5 = completely agree.

quizzes about neuropharmacology did not improve RITE performance compared to controls [5]. In another educational study, radiology residents using an audience response system during lectures demonstrated significantly more learning and long-term retention [6].

The incorporation of resident generated quiz questions for assigned textbook reading assignments was highlighted in our most recent Specialty Specific Program Information Form (PIF) for the Dermatology Residency Review Committee. In response to a question about Practice-Based Learning and Improvement (PR IV.A.5.c), our program was asked to:

"Describe one learning activity in which residents engage to identify strengths, deficiencies, and limits in their knowledge and expertise (self-reflection and self-assessment); set learning and improvement goals; identify and perform appropriate learning activities to achieve selfidentified goals (life-long learning)."

Our response to this question highlighted the adoption of this new educational process into our program:

"An example of this type of learning is when the PGY4 dermatology chief residents organize assigned textbook readings from Andrews' during each academic year, with the goal of completing this textbook in time for the annual in-service examination. This activity permits our residents to identify strengths, deficiencies, and limits in their knowledge and expertise (self-reflection and selfassessment) and set learning and improvement goals for themselves through appropriate learning activities in order to achieve self-identified goals such as life-long learning and critical thinking. These assigned readings are supervised by dermatology faculty (Dr. E. Kelly). All the residents read the assignment, and the reading is reviewed by a PGY4 resident, with faculty adding perspective. This comprehensive reading program is used by residents at all levels to identify the strengths, deficiencies, limits and areas of expertise and areas of special interest. One of the current PGY4 chiefs, Dr. N. Davis, has supplemented the assigned readings this year with short quizzes that he creates based on the readings that all the residents take prior to discussion as a method of self-assessment. Residents take the quiz prior to the discussion and then discover the correct answers during discussion of the reading by PGY4 residents. This type of supportive learning environment creates a learning environment of inquiry and problem solving that helps residents set learning and improving goals and focus on the type of learning activities that will help them achieve their goal of life-long learning and discovery. Dr. E. Kelly uses this learning activity to promote resident learning and evaluate the PGY4 residents, especially in relationship to their ability to communicate and teach their fellow residents about dermatology topics and their medical knowledge of these topics."

This pilot study suggests that resident generated ques-

tions about assigned textbook reading for the purpose of self-assessment may be applicable to other postgraduate residency programs outside of dermatology that have required textbook conferences. Another variation of this process with potential educational impact might be to engage all participants in question-generation [7]. Further exploratory studies with the goal to enhance this aspect of resident education should be considered. This educational experience is reported from one intermediate sized dermatology program, and it may not be directly applicable to smaller or larger programs in the same or different specialties. There was no control group. Question validity and reliability, as well as questionnaire validity have not yet been evaluated.

This preliminary educational research indicated that dermatology residents were receptive to resident-generated quizzes about assigned textbook readings. Although additional research which is needed in this area before any conclusion about the educational value of this activity can be made, our experience seems to indicate that this approach may be useful for resident education.

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## Appendix 1

#### Andrews' Questions (Chapter 27)

1) What is the most common extracutaneous manifestation of Incontinentia pigmenti? \_\_\_\_\_\_.

2) All of the following are associated with Naegeli-Franceschetti-Jadassohn syndrome EXCEPT:

a) hyperhidrosis;

b) toothlessness;

c) perioral and periorbital reticulate pigmentation;

d) absent dermatoglyphics;

e) congenital malalignment of the great toes.

3) In patients with Chondrodysplasia punctata, the classic x-ray finding is \_\_\_\_\_\_.

• CP is caused by a mutation in \_\_\_\_\_

important in the cholesterol biosynthesis pathway.

4) Turner syndrome (XO) is associated with an increased risk of:

a) angiomyolipomas;

b) periungual fibromas;

c) SCC;

d) pulmonary stenosis;

e) melanoma.

5) Name 2 syndromes caused by a mutation in PTPN11: \_\_\_\_\_\_.

• What is the common cardiovascular abnormality seen in both? \_\_\_\_\_\_.

6) In patients with Tuberous sclerosis, adenoma sebaceum or facial angiofibromas are frequently seen on the face. These lesions have also been reported in patients with

7) JXG + NF1 = \_\_\_\_\_.

8) In ataxia-telangiectasia, female carriers are at increased risk for \_\_\_\_\_.

pts can have persistently elevated levels of \_\_\_\_\_\_\_
and \_\_\_\_\_\_.

9) Name the associated epidermolysis bullosa:

a) clumped tonofilaments on EM \_\_\_\_\_

b) AD; recurrent bullous eruption of hands and feet \_\_\_\_

c) AR; plectin defect \_\_\_\_\_

d) AR; perioral and perinasal hypertrophic granulation tissue; greatest risk of corneal ulcers \_\_\_\_\_.

e) mutation in  $\alpha 6$ - $\beta 4$  \_\_\_\_\_

f) mitten-like deformity; high risk of SCC that can metastasize and cause death \_\_\_\_\_.

10) Name the gene defect for familial benign chronic pemphigus: \_\_\_\_\_\_.

11) Ichthyosis vulgaris: if you do a biopsy, the granular layer will be (thickened/reduced).

• Epidermal turnover rate is (increased/normal/de-

creased).

12) Why are patients with X-linked ichthyosis often born via C-section? \_\_\_\_\_.

13) What is the #1 cause of a collodion baby?

14) The mutations causing epidermolytic hyperkeratosis are \_\_\_\_\_\_.

• The mutation causing ichthyosis bullosa of Siemens is \_\_\_\_\_.

15) The common skin finding which includes migratory annular and polycyclic patches with Netherton syndrome is called \_\_\_\_\_\_.

Gene defect \_\_\_\_\_

16) Refsum syndrome is caused by a deficiency of

17) Name the connexin: KID syndrome \_\_\_\_\_

## EKV \_\_\_\_\_.

Clouston

18) When unilateral epidermal nevi show features of verruciform xanthoma, \_\_\_\_\_\_ syndrome should be suspected.

19) Which porokeratosis type has the greatest risk of malignant transformation? \_\_\_\_\_\_.

20) What AD genodermatosis, characterized by flat verroucous papules on backs of hands, insteps, knees, and elbows, is allelic to Darier's disease?

21) Matching:

a) Pachyonychia congenital, 1. Benign leukokeratosis of mucous membranes;

b) Dyskeratosis congenital, 2. Premalignant leukoplakia.

22) Hypotrichosis, anodontia, and febrile seizures due to absent eccrine glands would make you think of:

23) Thyroid disease, Methimazole, and the "hair collar sign" have been noted with \_\_\_\_\_.

24) Aplasia cutis congenital + CMTC + limb defects = \_\_\_\_\_ syndrome.

25) Name 3 disorders that are caused by defects in nucleotide excision repair.

26) Which DNA helicase disorder has a particularly high risk for osteosarcoma of bone?

27) Atrophodermia vermiculata + multiple BCCs is associated with what syndrome? \_\_\_\_\_\_.

#### Appendix 2

#### Andrews' Answers (Chapter 27)

1) teeth

2) a (perfect criminal = no sweating, no fingerprints,

"mask", no teeth for x-ray id)

3) Calcified stippling of epiphyses; emopamil-binding protein

4) e

5) Noonan, LEOPARD; pulmonary stenosis (not seen in Turner)

6) MEN 1

7) CML

8) breast cancer; AFP, CEA

9) a) Dowling Meara (EB herpetiformis

b) Weber-Cockayne (Localized EBS)

c) EBS with muscular dystrophy

d) Herlitz JEB

e) JEB with pyloric atresia

f) Recessive Dystrophic EB (Hallopeau-Siemens)

10) ATP2C1

11) reduced; normal (retention hyperkeratosis)

12) Failure of labor progression due to placental sulfatase deficiency

13) Nonbullous congenial ichthyosiform erythroderma

14) Keratins 1&10; Keratin 2e

15) Ichthyosis linearis circumflexa; SPINK5 (also remember LEKTI)

16) Phytanoyl CoA

17) connexin 26/GJB2; connexin 30.3 and 31/GJB3; connexin 30/GJB6

18) CHILD

19) linear

20) Acrokeratosis verruciformis of Hopf

21) a-1, b-2

22) Hypohidrotic ectodermal dysplasia (aka Christ-Siemens-Touraine)

23) Aplasia cutis congenital

24) Adams-Oliver

25) Xeroderma pigmentosum, Cockayne, Trichothiodystrophy

26) Rothmund-Thomson (aka poikiloderma congenitale)

27) Rombo