

Skin Rejuvenation—a Dermatology Curriculum

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Introduction

The Problem:

The University of Washington needs to provide medical students with an education in the basic science of the skin and its diseases such that they will be able to provide routine dermatologic care in a wide variety of clinical specialties.

As part of the curriculum redesign of the preclinical years at the UW, the skin curriculum needs to be streamlined, integrated with other subjects, and be teachable throughout the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) region where Dermatologist-educators are in short supply.

The Conceptual Model:

The University of Washington is unusual, but not unique, in servicing a geographically broad and multisite area through the WWAMI program. The need to provide increased education in non-Seattle locations of Laramie, WY, Anchorage, AK, Missoula, MT, Spokane, WA, and Moscow, ID as well as time constraints on the first 2 “pre-clinical” years of medical school have resulted in curriculum redesign in which the first 18 months of instruction will be run concurrently in 6 sites across 3 timezones and 5 states which account for over 25% of the land mass of the United States.

In addition to the widespread geography, an additional challenge has been to use the same instructional materials, strategies, and evaluation tools at all sites.

Similar challenges have been addressed in other programs in Australia, Michigan, Ontario, and most similarly in British Columbia (Bates et al). Specifics for incorporating a single curriculum for dermatologic pre-clinical education into such a multi-site program have not yet been published. The American Academy of Dermatology and American Professors of Dermatology developed an online clinical curriculum intended to serve all medical schools as an adjunct to a clerkship in Dermatology, but does not cover basic science and structure and function of the skin in enough detail for USMLE step 1 proficiency (Cipriano et al).

The curriculum presented here provides a syllabus, vodcasts, and case studies for dermatology and is designed to be given concurrently in all the WWAMI sites. This will utilize a “flipped classroom” model in which students will be expected to review relevant didactic material prior to sessions so that higher order learning and connections can occur during the sessions themselves.

The lack of dermatology specialists in some of the locations has required that this course be accessible for instruction by generalist clinicians or possibly even by non-clinician scientists such as Microbiologists or Biochemists. With the exception of a 1 hour instruction of morphology and the skin exam, the need for local experts is not necessary



Objectives and Components

Objectives in the new curriculum

Cognitive Objectives:

- By the end of the class, students will:
- 1—define the terms for primary and secondary lesions.
 - 2—describe the pathologic correlation to primary and secondary lesions and use this to construct a differential diagnosis based upon skin morphology.
 - 3—describe the layers of the epidermis, the major components of the dermis and skin appendages, and the protein complexes that attach keratinocytes to each other and to the basement membrane.
 - 4—identify and define at least one dermatological disease that is associated with defects in each of the above components.
 - 5—describe the phases of wound healing.
 - 6—list two major organisms for each category of normal flora or skin pathogens of bacteria or fungi or viruses and formulate appropriate treatments for these pathogens.
 - 7—list the components of the innate and adaptive cutaneous immune system and at least one dermatologic disease associated with alterations of each.
 - 8—describe how pigment is made and varies by ethnicity as well as diseases associated with pigment changes.
 - 9—describe the effects of UV radiation on the skin.
 - 10—correctly identify basal cell carcinomas, squamous cell carcinomas, and melanomas, list common risk factors and DNA mutations associated with each, and prognostic features for melanoma.
 - 11—rank the relative incidence and mortality of BCC, SCC, and melanoma.
 - 12—recommend appropriate choices for topical pharmaceutical treatments based upon knowledge of their indications and side effects.

Affective Objectives:

- By the end of the class, students will:
- 13—identify the impacts of skin disease on individuals and society.

Psychomotor Objectives:

- By the end of the class, students will:
- 14—perform a full skin examination

Educational Strategies

Curriculum content:

Syllabus (structure and function of the skin, clinicopathologic correlation, pigmentation, photobiology, skin cancer)
 Vodcast summaries of each syllabus section
 External website for skin morphology
 Team Based Learning sessions. Case study format. Topics:
 Epidermis-ichthyoses, eczema, psoriasis
 Fragile skin/blistering-Pemphigus, pemphigoid, EB
 Appendageal diseases-Acne Vulgaris, Hidradenitis suppurativa,
 Alopecia, Hyperhidrosis, Onychodystrophy
 RWJ module on itchy skin which covers tinea, parasites
 Hypopigmentation diseases
 Photosensitivity
 UV induced carcinogenesis
 Skin cancer epidemiology and pathophysiology
 Small Group sessions. Topics:
 Full skin exams and lesion morphology
 Clinicopathologic correlation
 Topical medications and vehicles

Educational methods:

Learners will review Syllabus, Vodcasts, and/or external websites prior to classroom sessions.
 A 5 question pre-test prior to each session will allow learners to assess their own learning and to tailor the sessions to be more learner centered.
 Large groups will be divided into small teams in most sessions to promote teamwork.

3-day curriculum

Outline of curriculum

	Session type	Topics	Diseases
Day 1			
Hour 1	Histology—didactics & lab	Structure and function of the skin	
Hour 2	Case study	Epidermal differentiation	Ichthyoses, Psoriasis, Eczema
Hour 3	Case study	Desmosomes, Hemidesmosomes	Pemphigus, pemphigoid, staph scalded skin, epidermolysis bullosa,
Hour 4	Case study	Hair follicles, sebaceous glands, apocrine glands, Nails, eccrine glands	Acne, hidradenitis, alopecia areata, androgenetic alopecia, telogen effluvium, Hyperhidrosis, pitted keratolysis
Day 2			
Hour 1	Small group	Full Skin Exam Morphology	
Hour 2	Small group	Clinicopathologic correlation	
Hour 3	Small group	Topical Medications, vehicles, side effects	
Hour 4	RWJ module	Itchy skin	tinea
Day 3			
Hour 1	Case study	Melanin synthesis, function, and transport, melanocyte migration	Albinism, piebaldism, waardenburg, dermal melanocytosis, vitiligo
Hour 2	Case study	Melanins, sunburn, sunscreen, drugs & lupus photosensitivity	Skin cancer, lupus, drug reactions
Hour 3	Case study	Skin cancer morphology, oncology, risk factors, epidemiology	Basal cell carcinoma, squamous cell carcinoma, malignant melanoma
Hour 4	Large group?	Melanoma immuno-therapeutics, immunology	melanoma

Conclusions

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This new Dermatology curriculum for the WWAMI program at UW addresses the need for a reduction in required classroom time while also allowing concurrent instruction at multiple institutions by non-specialists.

Students who master the objectives of the course will be adequately trained to do well on the USMLE step 1 exam and address common skin concerns while on clerkships. In addition, by utilizing a flipped classroom model and predominantly small group formats, they will be able to achieve a higher level understanding of the skin and skin disease. Removing didactic information from the classroom allows time to be spent making connections and deepening understanding. This is not a novel concept to Dermatology.

“Didactic presentation today is for the printed page and mimeographed sheet. I would tell the student little or nothing about anything, and lead him instead, by skillful questioning and discussion, to create his own fund of information out of what lies before him for observation, cemented by inductive reasoning based on his own past knowledge, medical and personal.”
 –Stokes, J.H., Teaching of Dermatology and Syphilology to Medical Undergraduate. Archives of Dermatology and Syphilology, 1928.

Such an understanding of skin physiology and how it may be altered in disease states will serve them well later in any chosen specialty when they encounter patients with skin disease.

This redesign is unique in that it enables the education of medical students in geographically disparate locations by non-dermatologist physicians and even non-physician scientists. With the exception of instruction in a full skin exam small group session, the course can be implemented without prior dermatology expertise.

References

- Bates, J., O. Casiro, B. Fleming, V. Frinton, A. Towle, D. Snadden. Expanding Undergraduate Medical Education in British Columbia: a Distributed Campus Model. CMAJ. 2005 Sep 13;173(6):unabridged online version 1-7.
- Cipriano, S.D., E. Dybbro, C.K. Boscardin, K. Shinkai, T.G. Berger. Online Learning in a Dermatology Clerkship: Piloting the New American Academy of Dermatology Medical Student Core Curriculum. 2013 Aug;69(2):267-72.
- Stokes, J.H. Teaching of Dermatology and Syphilology to Medical Undergraduate. Archives of Dermatology and Syphilology, 1928 Apr; 17:467-8.

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