

# Curriculum Design to Promote Research Literacy

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# Naturopathic and Chinese Medical Education

## **Naturopathic - ND**

- 4 year medical degree
- Years 1-2– basic sciences
- Basic science boards
- Years 3-4– clinical
  - Nutrition, herbal medicine, pharmacology, physical medicine, counseling, mind-body, minor surgery
- Clinical boards
- Nationally accredited
  - 5 schools in the US

## **Chinese Medicine – LAc**

- 3 or 4 year master's degree
- Basic science and clinical science integrated throughout
- Clinical science includes acupuncture, nutrition, Qi gong, Chinese herbal medicine
- Acupuncture boards
- Nationally accredited
  - 50 schools in the US

# Objectives

- Learning objectives/competencies to guide both curriculum development and assessment;
- Longitudinal curricula initiatives to encourage skill reinforcement;
- Classroom and clinical teaching strategies;
- Institutional challenges and lessons learned

# Planting Research Literacy in the Curriculum

- NIH awarded nine R25 Research Education grants
  - 4 Years; Renewal – 4 additional years
- Goal – to enhance EBM and research skills at Complementary and Alternative Medicine Schools (CAM Schools)
- Collaboration required



NIH provided the fertilizer

Institution City, State	Total Enrollment*	Graduate and Professional Programs of Study Enrollment in R25 target programs in bold; undergraduate programs not included	Collaborating Institution(s)
<b>AT Still University (ATSU)</b> Kirksville, MO	3,624	<b>Osteopathic medicine (n=680)</b>	Penn State
<b>Bastyr University</b> Kenmore, WA	1,018	<b>Naturopathic medicine (n=409)</b> , acupuncture and oriental medicine, nutrition, counseling	University of Washington
<b>National College of Natural Medicine (NCNM)</b> Portland, Oregon	570	<b>Naturopathic medicine, acupuncture and classical Chinese medicine (n=570)</b>	Oregon Health & Science University (OHSU)
<b>National University of Health Sciences (NUHS)</b> Lombard, IL	985	<b>Naturopathic medicine, Chiropractic medicine (n=646), Acupuncture and oriental medicine</b> , massage therapy	University of Illinois Chicago, School of Public Health
<b>Northwestern Health Sciences University (NWHSU)</b> Bloomington, MN	859	<b>Chiropractic medicine, Acupuncture and oriental medicine, massage therapy (n=670)</b>	University of Minnesota
<b>Oregon College of Oriental Medicine (OCOM)</b> Portland, Oregon	270	<b>Acupuncture and oriental medicine (n=225)</b>	Oregon Health & Science University (OHSU)
<b>Palmer College of Chiropractic</b> Davenport, IA	2,106	<b>Chiropractic medicine (n=1102)</b> , clinical research	University of Iowa and Thomas Jefferson University
<b>University of North Texas Health Science Center Texas College of Osteopathic Medicine (TCOM)</b> Fort Worth, TX	1,200	<b>Osteopathic medicine (n=685)</b>	University of Texas Medical Branch at Galveston (UTMB)
<b>University of Western States (UWS)</b> Portland, Oregon	519	<b>Chiropractic medicine (n=462)</b> , massage therapy	Oregon Health & Science University (OHSU)

# Learning Objectives

- Primary outcome:
  - Clinicians who use EBM  
i.e. know how to read  
and evaluate research  
literature
- Secondary outcomes:
  - Clinicians who conduct  
practice based research
  - Clinicians who become  
Physician-scientists



What does our final product look like?



# Strategy to Implement Curriculum Change

1. Needs Assessment
2. Curriculum Mapping
3. Defining Competencies
4. Engaging EBM champions on campus
5. Input from curriculum development experts
6. Faculty development
7. Evaluation plan



# Needs Assessment

- Goal: To identify current knowledge, skills, attitudes and behaviors of students, faculty and the institutions' administration





# First set of challenges

- Challenges:
  - Adding EBM to already packed curriculum
    - Can either cut existing material, or
    - Maximize what is already there
  - Some therapies don't have a literature base



# Needs Assessment Results

- Lack of consensus for the definition and process of the EBM
- Research literature in some courses; however, no hierarchy of evidence nor focus on developing strong critical appraisal skills.
- Basic science faculty members unclear about how to integrate clinical relevance into teaching about research
- Poor quality research materials and non-peer reviewed articles.
- Historical clinical texts as substitutes for research literature.
- Faculty reported that they “used EBM” because they listed references on course materials.
- References listed were outdated or were not actually incorporated into the curriculum.

# Curriculum Mapping

- Goal: To determine which classes already had components of EBM or were ready for revision
- Which subject areas have strong enough literature base

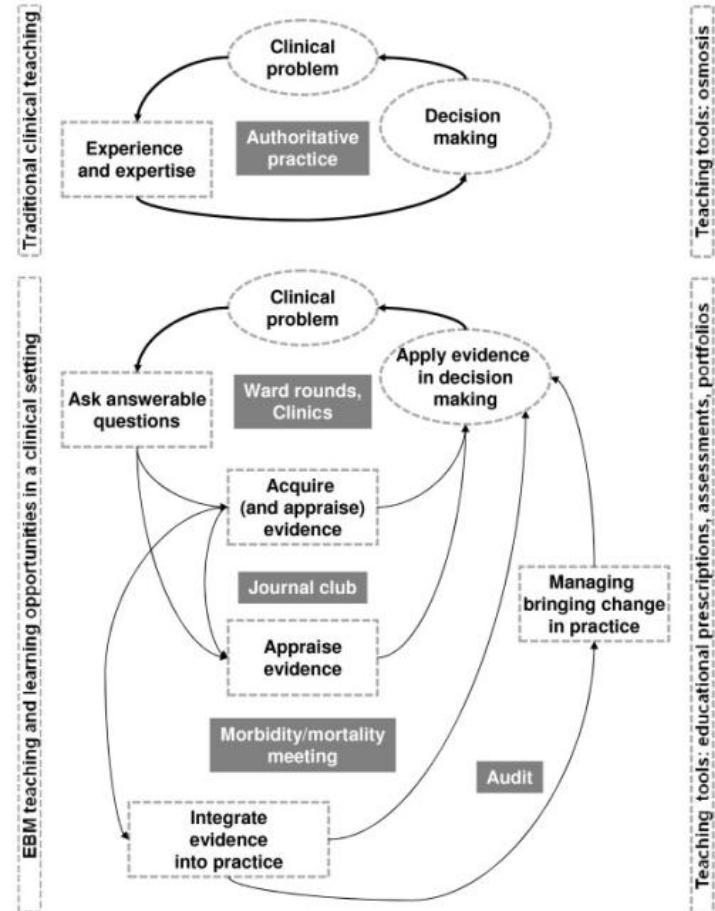


# Defining Competencies

- Ask a clinical question
- Search the literature
  - Not usually Pubmed
  - UpToDate, First Consult, TRIP Database
- Critically evaluate the information
  - Basic biostats such as P values and confidence intervals
  - Also Relative Risk, Absolute Relative Risk, Reduced Risk Ratio, and Number Needed to Treat
- Weigh the literature with other information
- Apply to the clinical case
- Assess effectiveness

# Defining Competencies

- Community involvement
  - Buy-in from the rest of the faculty
  - Buy-in from student groups
  - Buy-in from librarians



Teaching trainers to incorporate evidence-based medicine (EBM) teaching in clinical practice: the EU-EBM project Thangaratinam S, Barnfield G, Weinbrenner S, Meyerrose B, Arvanitis TN, Horvath AR, Zanrei G, Kunz R, Suter K, Walczak J, Kaleta A, Oude Rengerink K, Gee H, Mol BW, Khan KS - BMC Med Educ (2009)

# Engaging EBM champions on campus

- “Early adapters” among administrators, faculty and students
- Advocates of research, research literacy and EBM initiatives.
- Self-identified as non-experts outside of the grant PI, co-investigators and core team
- Volunteered for key roles in teaching, integrating and identifying opportunities for content placement in courses and clinical activity



Champions required!



# Curriculum Development Experts

- Some institutions had instructional designers or curriculum deans
- Some institutions received this type of assistance from collaborating institutions



Bring in the experts!

# Faculty Development – Equipping the Faculty



# Faculty Development

- Faculty often haven't been trained to offer this type of curriculum
- Training the faculty provides the fertile soil for cultivating the students



# Faculty Development

## Two strategies

- Train entire faculty
- Train a select cadre

## Approach

- Series of short workshops
- Short courses – week long intensives



# Faculty Development

- Faculty training must keep up with the students
- Often faculty need to trim some material to add new
- Faculty may need less time learning to do the stats, and more time with the technology





# Evaluation Strategies

- Knowledge, Skills, and Attitude scales
- Artifacts
- Rubrics
- Focus groups
- Interviews
- Portfolios
- Natural History Log



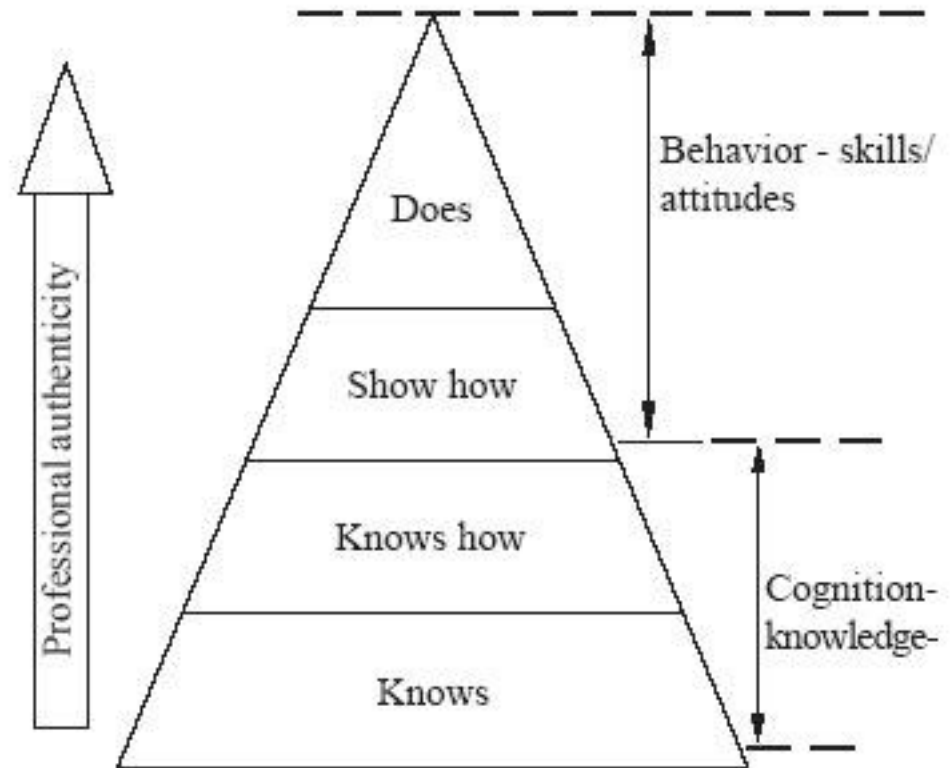


# Evaluation

- Bloom

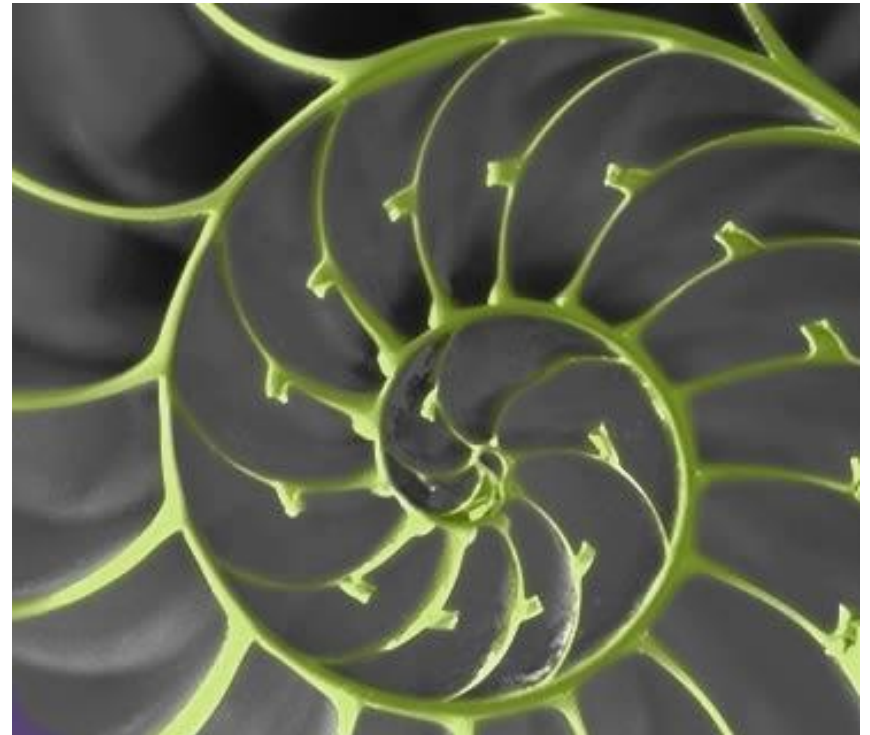


- Miller



# Curriculum – Classroom and Clinical Activities

- Foundational Skills Course
- Spiral/Longitudinal Learning
  - Reinforce skills later in didactic and clinical curriculum → Clinic



# Example of Reinforcement

- Anatomy lab, Micro, Immuno, Pathology, etc.
  - Ask a clinical question
  - Find the literature
  - Critically evaluate
- Clinical courses and clinic
  - Add applying it to the case
  - Assess whether or not it worked



# Classroom Teaching Strategies

- Add a case study – lit search assignment
- Ask a question during class - have students look things up on their phones/iPads during class
- Cite good papers – and walk students through WHY they're good during class



Plant the seeds...



# Clinical Teaching Strategies

- Chart stimulated recall
- Modified One-Minute-Preceptor
- Thinking aloud
- TBL – mini journal clubs



# Active Learning

- Students have to perform EBM activities for themselves
  - May never get good at locating literature if it's always being demo'd
  - Stocking the pond



Stocking the pond – make sure the literature is available before you assign the search



# Power of Narrative

- Students learn from stories and anecdotes – especially stories they can repeat/recall
- Adding an active EBM component can further solidify the information
- Using cases reduces the silo effect



Garden of Eden – great story!

# Technology

- Online content
  - Foundational courses online
  - Online cases
  - Online discussion boards
- Apps for databases, biostats, etc.
- Reference managers
  - Students keep track of the papers they're reading



Students are going to bring their technology to class so you may as well put them to work.

# Institutional Challenges and Lessons Learned

- Culture change is required
- Change occurs at a slow pace
- Busy schedules – times for meetings
- People don't know what they don't know



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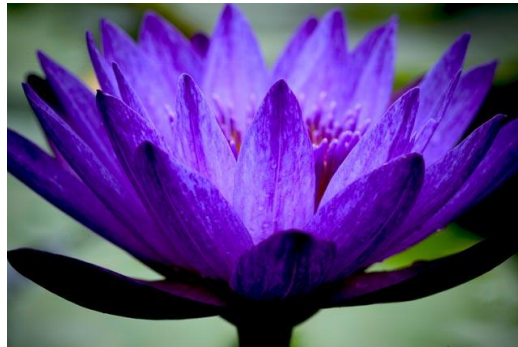
# Summary

- Adding Research Literacy/EBM to the curriculum is challenging but possible
- Curriculum development and faculty development go hand-in-hand



# Acknowledgements

- Colleagues at the National College of Natural Medicine
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# Thank you!



Come visit us in Oregon anytime- or come back!