Basic Medical Science Course Directors in Integrated Medical Curricula

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Objectives

• Discuss the creation of an integrated systems block curriculum from the perspective of a basic medical scientist.
• Describe the challenges for a basic scientist in designing integrated courses.
• Identify resources that are helpful.
• Describe how subject matter can be chosen and prioritized.
• Provide specific strategies for educators to design or refine their own curriculum.

Scenario

As a Basic Science Course Director for discipline X, you have been asked to participate on a curriculum renewal workgroup. The charge to the workgroup is to review and revise the preclinical curriculum and design an integrated curriculum. You are not sure what this entails.

Define: Integrated Curriculum

• Integrative
  – “…connecting skills and knowledge from multiple sources and experiences; applying theory to practice in various settings;”
• Integrated curriculum
  – refers to a non-compartmentalized approach to basic science learning

There is No One Way To Integrate

Each medical school needs to select methods appropriate for its own goals, structure, and constraints.
How Will Integration Occur?

- Organ Systems
- Stages of Human Development
- Disease or Clinical Presentation
- Medical Competencies

Adapted from Goldman and Shroth, Acad. Med. 2012;87:729-734

Historical Perspective at UA COM

University of Arizona College of Medicine–Tucson: 1967

Discipline-Based

Phoenic campus site for clinical rotations: 1992

Curriculum Renewal: Began in 2003

Integrated Curriculum

Implemented in Tucson: AY 2006

Year 1 Implemented in Phoenix: AY 2007

Overview of Preclinical Block Curriculum

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Clinical Anatomy</th>
<th>Neurological Sciences (NLS)</th>
<th>Cardiovascular, Pulmonary, Renal Systems (CPR)</th>
<th>Musculoskeletal systems (MSS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolog</td>
<td>Molecular Basis of Life and Disease (MBLD)</td>
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<tr>
<td>Capstone</td>
<td>Doctoring</td>
<td>Longitudinal Clinical Experience</td>
<td>Scholarly Project</td>
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</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Biomedical Informatics</th>
<th>Behavioral Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedical Informatics</td>
<td></td>
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<tr>
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<td>Doctoring</td>
<td>Longitudinal Clinical Experience</td>
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</tbody>
</table>
**Weekly Structure** Example from the CPR Block

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am CBI open</td>
<td>Electrical Activity of the Heart (PA)</td>
<td>EKG Interpretation (PA)</td>
<td>Cardiac Development (PA)</td>
<td>CBI close</td>
</tr>
<tr>
<td>10:00 am</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11:00 am Impact of Cardiac Disease in the US</td>
<td>Cardiac Structure and Imaging (Medicine)</td>
<td>Antihypertensive Drugs (PA)</td>
<td>Physiology Lab EKG</td>
<td>Cardiac Contraction (PA)</td>
</tr>
<tr>
<td>Noon</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1:00 pm</td>
<td>Integration of ANG Concepts with CPR (PA, CU)</td>
<td>ECG Group 1</td>
<td>ECG Group 2</td>
<td>ECG Group 3</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Electrical Activity of the Heart (PA)</td>
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<tr>
<td>3:00 pm</td>
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<tr>
<td>4:00 pm</td>
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<tr>
<td>5:00 pm</td>
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**Seek A Clinical Co-Director!**

- Surround yourself with bright people!
- Start building a team
  - Heads of other disciplines
- Librarian
  - Aware of the curriculum and notify you of pertinent information

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**Resources**

- National Guidelines
  1. AAMC Medical School Objectives Project
     [https://www.aamc.org/initiatives/msop/](https://www.aamc.org/initiatives/msop/)
  2. USMLE Step 1 content outline
  3. Discipline-based societies (American Physiology Society)

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**Get Clinician Input**

- Circulate your list to practicing clinicians
  - Seek out a resourceful person in the administration unit who can identify clinicians in the area
- Continue to modify your list

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**Getting Started:**

Develop a list of key topics

List of Topics

What is Relevant to the Practice of Medicine

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**Resources**

- Textbooks – Scrutinize and compare table of contents
- Utilize curriculum sharing with other schools
At the Same Time, You Should be:

- Writing objectives, goals and/or outcomes
- Choosing textbook or other resources
- Drafting a syllabus

Choosing Subject Matter and Prioritizing

- Director is not necessarily expert at all content
  - Seek clinical input
  - Ask for recommendations
  - Audits of disciplines
- As you bring in good teachers, get their input on additional content
- Doesn’t all have to go in preclinical years

Scheduled Meetings

- Theme directors meeting
- Block, Course, Theme Subcommittee meeting
- Curriculum Committee meeting – final approval

Preparation for Class Sessions

<table>
<thead>
<tr>
<th>Teaching Format</th>
<th>Teaching Methods</th>
<th>Use of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Group</td>
<td>Interactive Lecture</td>
<td>Audience Response System</td>
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<tr>
<td></td>
<td>Team Learning</td>
<td></td>
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<tr>
<td>Small Group</td>
<td>PBL, Case-based</td>
<td>Videos</td>
</tr>
<tr>
<td>Independent Learning</td>
<td>Podcast Voice-over PPT</td>
<td>Camtasia Embedded test</td>
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<td></td>
<td></td>
<td>Hyperlinks</td>
</tr>
<tr>
<td>Simulation</td>
<td>High-fidelity</td>
<td>SimMan</td>
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<tr>
<td></td>
<td>Low-fidelity</td>
<td>Online Module</td>
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<td></td>
<td>Computer-based</td>
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</tbody>
</table>

Orienting Clinicians to Teach in the First Two Years

- Clinicians teach differently than basic scientists
  - Teach from a practice-based perspective
- Role model the competencies
- Provide faculty development
Orienting Clinicians

- Introductory letter denoting
  - Where students are in the curriculum
  - What they’ve been taught already
  - Number of slides expected
  - Time frame of session

- Can’t cover every clinical entity
  - 3-5 learning objectives based on common occurrences
  - Be proactive and provide objectives!

Planning Methods of Assessment

- Integrative Assessment
- Formative → Summative
- Every session has associated “Thought Questions”
- Summative exams (USMLE-style multiple choice) scheduled 3-4 weeks
- Exam Review Teams

Scale and Timeline

- Enlist a partner
- Time to complete
  - A year is optimal!
- First time launch: sit in on every session
Curriculum Evaluation
- Curriculum work group formed to review performance:
  - Taking into account
    - Exam statistics
    - Student evaluations
    - Block director self study
    - Student focus group meeting
  - Recommendations approved by curriculum committee for improvement the following year

Maintaining Relationships
- Provide feedback
  - Not only from student evaluations, but on exam question editing and results

Challenges and Resolutions
- Stubborn resistance
  - Be willing to change the paradigm
  - Be willing to compromise
- Cover material in less time
  - Provide means for self-study
- Scheduling
  - Flexibility vs firmness
  - Need both

Challenges and Resolutions
- Do you need the expert in the field?
  - Engage primary care physicians
- Receiving materials late
  - Establish expectations and deadlines clearly and early
  - May have to send several reminders to get materials on time

Challenges and Resolutions
- No shows
  - Develop a teaching contingency plan
- Clinician turn-over
  - Keep a file of contacts
- Too many cameos - Work toward consistency
  - Encourage participation in more than 1 session
  - Continue to engage the good teachers

Challenges and Resolutions
- Sequencing
  - Many different ways; continue to refine
- Choosing an appropriate reference textbook
  - Many are discipline based
- Exam question writing
  - Training clinicians and other faculty to write USMLE style questions
Challenges and Resolutions

• Uncomfortable faculty
  – Teaching outside their comfort zone
  – Build relationships

• Communication between disciplines
  – Encourage discussion of topics in the context of health and disease

• Tracking content
  – Build a curriculum management system

Outcomes

Integrated Assessment

Integrated Curriculum

Summary

• Allow plenty of time
• Engage many people
• Utilize all available resources
• Link objectives, content, teaching methods to optimize learning
• Create integrative assessments
• Continue to develop and refine
• Always be open to new ideas

Additional Resources

Perspective: Deconstructing Integration: A Framework for the Rational Application of Integration as a Guiding Curricular Strategy
Marshall, M., and W. Scott School, MD, MPH

Provides an organizational framework for curricular integration from the program level to the course level to the session level.

The integration ladder: a tool for curriculum planning and evaluation

Ronald M. Hazard, Medical Education 2000, 34:551–557

Provides a framework based on degree of integration presented over a continuum.