Healthcare Improvement Sciences in UME

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ACMQ Future Leaders in Quality & Safety
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Dedicated to inspiring diverse and promising students to lead and transform medicine for the betterment of humanity.
Traditional Undergraduate Medical Education

- **System Design**
  - Teacher-centered
  - Lectures
  - Memorization of facts
  - Siloed approach
  - No education on quality, safety, systems design

- **Results**
  - Forget great deal of basic sciences
  - Missed connections
  - Problem solving and applications skills can be improved
  - No team prep
  - IOM reports
Healthcare Improvement Sciences (HIS)

- Quality
- Safety
- Value (Quality/Cost)
- Systems-Based Practice
- Practice-Based Learning & Improvement
- Interprofessionalism
# Integrated Curriculum Overview: 1st 100 Weeks

## Curricular Components

<table>
<thead>
<tr>
<th>Mechanisms of Health, Disease, and Intervention</th>
<th>Structure</th>
<th>Patient, Physician, and Society</th>
<th>Research &amp; Scholarship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form &amp; Function in Health and Disease; Introduction to Organ Systems; Principles of Pharmacology; Core Clinical Skills</td>
<td>Anatomy, Pathology, Embryology, Imaging, Physical Diagnosis</td>
<td>ICE-EMT Certification</td>
<td>Communication Skills, Professionalism, Continuum of Care, Social Context/Responsibility, Quality and Effectiveness, Scientific Discovery, Decision Making and Uncertainty</td>
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<tr>
<td>The Biologic Imperative (BI)</td>
<td>Physiology, Pathophysiology, Therapeutics</td>
<td>ICE-Medicine, OB/GYN</td>
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<tr>
<td>Cell, Molecular, and Developmental Biology; Genetics; Reproductive and Endocrine Systems; Cells of Hematologic System</td>
<td>Reflection, Integration, &amp; Assessment</td>
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<tr>
<td>Metabolism; Gastrointestinal System</td>
<td>Reflection, Integration, &amp; Assessment</td>
<td>Reflection, Integration, &amp; Assessment</td>
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<tr>
<td>Cardiac, Pulmonary, Renal Systems</td>
<td>Reflection, Integration, &amp; Assessment</td>
<td>Reflection, Integration, &amp; Assessment</td>
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<tr>
<td>Microbiome; Infectious Disease; Host Defense; Musculoskeletal System</td>
<td>Preparation for USMLE Step I</td>
<td>Preparation for Advanced Clinical Experience</td>
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<tr>
<td>Nervous System; Brain and Behavior</td>
<td>Reflection, Integration, &amp; Assessment</td>
<td>Reflection, Integration, &amp; Assessment</td>
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<tr>
<td>ICE-Medicine, Pediatrics</td>
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<tr>
<td>ICE-Pediatrics, Psychiatry</td>
<td>Reflection, Integration, &amp; Assessment</td>
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</table>
# PEARLS=Foundation of Curriculum

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>8:00am</td>
<td>PEARLS Case 1</td>
<td>Self-Directed</td>
<td>PEARLS Case 1</td>
<td>Structure</td>
<td>PEARLS Case 2</td>
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<tr>
<td></td>
<td></td>
<td>Learning</td>
<td>(continued)</td>
<td></td>
<td>(continued)</td>
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<tr>
<td>9:00am</td>
<td>PEARLS Case 2</td>
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<tr>
<td>10:00am</td>
<td>Large/ Medium/</td>
<td>Review &amp;</td>
<td>Large/ Medium/</td>
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<td>Large/ Medium/</td>
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<td></td>
<td>Small Group</td>
<td>Reinforcement</td>
<td>Small Group</td>
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<td>Small Group</td>
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<tr>
<td>11:00am</td>
<td>Large/ Medium/</td>
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<td>Large/ Medium/</td>
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<td>Large/ Medium/</td>
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<td></td>
<td>Small Group</td>
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<td>Small Group</td>
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<td>Small Group</td>
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<tr>
<td>12:00pm</td>
<td>LUNCH</td>
<td>LUNCH</td>
<td>LUNCH</td>
<td>LUNCH</td>
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<td>1:00pm</td>
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<td></td>
<td>LUNCH</td>
<td></td>
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<tr>
<td>2:00pm</td>
<td>Initial Clinical Experience (ICE)</td>
<td>Self-Directed Learning</td>
<td>Self-Directed Learning</td>
<td>LUNCH</td>
<td>Self-Directed Learning</td>
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<td>3:00pm</td>
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<td>4:00pm</td>
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## Goals of PEARLS=Content & Process

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<tr>
<th>Biomedical Science Goals</th>
<th>Healthcare Improvement Science Goals</th>
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<td>• Leadership</td>
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<tr>
<td>• Life-long learning</td>
<td>• Teamwork</td>
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<tr>
<td>• Critical thinking</td>
<td>• Practice-Based Learning</td>
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<tr>
<td>• Systems-Based Practice</td>
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**Biomedical Science Goals**

- Acquiring knowledge of biomedical sciences
- Life-long learning
- Critical thinking

**Healthcare Improvement Science Goals**

- Leadership
- Teamwork
- Practice-Based Learning
- Systems-Based Practice
PEARLS and Healthcare Improvement Sciences

• Content
  ▫ Case topics
  ▫ Continuous charge to integrate cost and best practices

• Process
  ▫ Group process: roles, check in, wrap-up, action plans
  ▫ Wrap-up framings
PEARLS Content - Case Topics

- **≤60 min**: Give Actrapid subcutaneously and initiate infusion in eligible patients
- **0 min**: Suspected stroke patient arrives at ED
- **≤10 min**: Complete initial ED evaluation, including patient history, perform neurological exam, and assess for potential stroke symptoms
- **≤15 min**: Notify stroke team (including neurology expertise)
- **≤45 min**: Interpret CT scan and lab results; ensure patient eligibility for Actrapid
- **≤25 min**: Initiate CT scan
PEARLS Content-Case Topics
Interactive Exercise Tie to PEARLS
PEARLS and Healthcare Improvement Sciences

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PEARLS Content - Continuous Charge
PEARLS Content - Continuous Charge: Cost

Health Care Costs (First Year Students)

• Variation in cost-within U.S.; U.S. and other countries

• Financing of healthcare and how that impacts cost and access

• Cost of procedures-imaging, biopsies

• Cost of medications-one vs. another, same medication for two different indications and variance in cost
PEARLS Content-Continuous Charge: Cost

- Health Care Costs (First Year Students)
  - Retinoblastoma
    - What is cost of procedures? Will they be covered by insurance? Why surgeons fees for same procedures vary?
  - HPV
    - Pap smear has value as diagnostic tool due to low cost & high sensitivity; What is cost HPV vaccine in U.S. vs. developing countries?
  - Lung Cancer
    - In countries with single payer systems, medication decisions based on being effective and efficient for society-how does that work? What is cost of genetic testing? Cost of chemotherapies?
  - Breast Cancer
    - What is cost of MRI vs mammography? Cost of tamoxifen prophylaxis? Cost of biopsies resulting from false positive screening?
  - Prostate Cancer
    - Discussed relative cost of finasteride 1mg for hair restoration as more expensive than finasteride 5mg for prostate cancer and why that might be
PEARLS Content - Continuous Charge: Cost

Health Care Costs (Second Year Students)
- Costs for medications & procedures
- Influence of patents on cost
- Influence of cost on ordering tests
- Variation in coverage of insurance policies and rationale
- Cost to health system vs. cost to patient
- Impact of paying cash vs. insurance on doctor-patient relationship
PEARLS Content-Continuous Charge: Cost

- **Health Care Costs (Second Year Students)**
  - **Familial Mediterranean Fever**
    - Biologics are expensive! Why did cost of colchicine became more expensive through a special patent between government and industry?
  - **Bare Lymphocyte Syndrome**
    - Costs of flow cytometry, ELISA, Western Blot—which is cost effective to order first if indicated? What is cost of BMT and subsequent follow up care based on plan with $3000 deductible, 70% coverage, $15,000 max out of pocket?
  - **T-cell ALL**
    - Aetna’s policy for when BMT will be covered? Cost of monoclonals? Are patients treated better when paying cash?
  - **Influenza**
    - Cost to run a respiratory panel in our lab is $150 and charge for panel is $300-700-why?
PEARLS Content-Continuous Charge: Best Practices

• Health Care Best Practices (Second Year Students)
  ▫ SCD Infections
    • Blood culture collection from different sites and why?
    • Ways to avoid medical errors during blood transfusions.
  ▫ E. Coli Outbreak
    • Why collect three stool specimens on patient with diarrhea?
  ▫ HIV
    • Guidelines for testing, treating and preventing HIV transmission.
  ▫ Tuberculosis
    • Gold standard for testing.
  ▫ Influenza
    • Practices for preventing infection control.
    • Indications and non-indications for Tamiflu.
PEARLS Content - Continuous Charge

- Need tool to assess knowledge-any ideas/suggestions most welcome!
PEARLS and Healthcare Improvement Sciences

• Content
  ▫ Case topics
  ▫ Continuous charge to integrate cost and best practices

• Process
  ▫ Group process: roles, check in, wrap-up, action plans
  ▫ Wrap-up framings
# PEARLS Process and Healthcare Improvement Sciences

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<thead>
<tr>
<th>Process</th>
<th>Healthcare Improvement Science Goals</th>
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</thead>
<tbody>
<tr>
<td>• Student &amp; Faculty Development</td>
<td>• Leadership</td>
</tr>
<tr>
<td>• Groups (teams) &amp; Facilitator</td>
<td>• Teamwork</td>
</tr>
<tr>
<td>• Check-in</td>
<td>• Practice-Based Learning Improvement</td>
</tr>
<tr>
<td>• Roles in group (team)</td>
<td>• Systems-Based Practice</td>
</tr>
<tr>
<td>• Function of group (team)</td>
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<tr>
<td>• Self and Group Assessments</td>
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<tr>
<td>• Action Plans</td>
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<tr>
<td>• Wrap-up Frames</td>
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PEARLS Assessments and Healthcare Improvement Sciences

- Communicates effectively; does not dominate or sidetrack conversations
- Listens attentively and considers alternative explanations and suggestions provided by other teammates
- Every time when leader, demonstrates the ability to manage the team and coordinate the activities of team members
- Initiates and/or participates constructively in discussions of health care costs
- During wrap-up provides an analysis of the group’s (system’s) processes
PEARLS Assessments and Healthcare Improvement Sciences

- During Monday check-in, performs self-assessment of learning from prior week
- During wrap-up, performs specific, constructive self-assessment
- During wrap-up, provides suggestions for improvement
- Creates and comments upon a personal action plan from week to week
- Modifies behavior based upon areas identified during self-assessment, group feedback and mid-course meeting.
- Initiates and/or participates in discussion of health care best practices
Didactic Sessions and Healthcare Improvement Sciences
Future Opportunities in Healthcare Improvement Sciences
Areas for Opportunity & Thought in Healthcare Improvement Sciences and UME

• What should be the UME curriculum in HIS? Work backwards...
• Role modeling? Experiential opportunities?
• How will we define success?
Many thanks!

MAKE NO LITTLE PLANS; THEY HAVE NO MAGIC TO STIR MEN'S BLOOD.

Daniel Burnham