Review of Year 2 Respiration course

• Course occurs in the first term of Year 2
• Course Director – Harold Manning, MD
• Course has 46.5 curricular hours (plus 6 hours of PBL)
• Course was last reviewed in March 2012
Action Plan from Prior Review

- Improve the images on the final exam *(done)*
- Provide a few more practice questions prior to the exam *(done, although students continue to request more)*
- Continue trend to a few more active, “interactive” large learning conferences *(done)*
- Consider reducing time spent in the 8 hours of pathology lab exercises, which students reported as not being very useful, with poor student attendance *(pathology sessions have been reduced by 1 hour)*
- Do more with the PFT lab, for example, studying how various PFTs *(e.g. FVCX, FEV1, MIP, etc.)* vary with student height, weight, gender, etc. *(done)*
1. Correlate pathological changes in the respiratory system with the accompanying physiological abnormalities
2. Correlate the pathological and physiological changes with the clinical manifestations of lung disease
3. Explain the pathophysiology and treatment of common respiratory symptoms, such as cough and shortness of breath
4. Interpret a variety of different types of pulmonary function tests
5. Describe how patterns of abnormal lung function characterize different respiratory disorders
6. Measure one's lung function, predict how a variety of factors will affect the results of pulmonary function testing, and describe some of the difficulties and limitations of pulmonary function testing
7. Describe basic radiographic findings in common respiratory disorders
8. Explain how the physiological and pathological abnormalities that occur in patients with respiratory disease give rise to the symptoms experienced by patients and the physical findings (signs) that can be observed
9. Describe the role played by genetic factors in common respiratory diseases
10. Describe the role played by environmental factors in common respiratory disorders
11. Describe common developmental abnormalities of the respiratory system
12. Explain the pharmacological and non-pharmacological treatments for a broad range of respiratory diseases and when possible correlate with the underlying pathobiology
13. Describe the changes in lung function that occur during fetal development and during the transition from uterine to extrauterine life
14. Explain the basic principles of screening and clinical epidemiology
15. Describe factors that may limit the adoption and/or slow the implementation of new science to patient care or that limit patient compliance with recommended treatments
16. Demonstrate the ability to piece together pieces of information from the history, physical examination, pulmonary function tests, and imaging studies to arrive at a list of the most likely diagnostic possibilities
17. Communicate with fellow students and faculty about patients with respiratory disease
18. Demonstrate the team skills by participating in small group conferences
19. Demonstrate the responsibility for self-education
20. Educate patients and families about illness
21. Describe the impact of chronic respiratory disease upon patients and their families
Course Objectives – Comments

• Objectives capture the course content well
• It could be useful to specify the “common lung diseases” covered in the course in order to capture this content in ILIOS
• USMLE content:
  – Course covers majority of USMLE content, although some specific, obscure conditions may not be addressed in detail (e.g. bagassosis, juvenile papillomatosis, DIP, byssinosis, BOOP, pulmonary alveolar proteinosis)
  – Some of these clinical conditions are more likely to appear on step 2CK or step 3 rather than step 1 and may be encountered by students in clerkships or electives
Format of Course & Session Objectives

- Course objectives are provided in the syllabus
- Course objectives are written in the correct format
- Session objectives are provided in the course materials
- A few session objectives are not written in the correct format
  - Some use the verb “understand” (e.g. Review of Gas Exchange and Blood Gas Transport), which should be updated to indicate what students should be able to “do”
Issues of Redundancy

- Students commented that some intentional redundancy within the course and with year 1 physiology was helpful and a strength of the course.

- No major redundancy identified with other courses.
Exploration of Ethics

- Interactive Ethics large group discussion session with Tim Lahey and Bill Nelson focused on issues related to withdrawal of mechanical ventilation

- Session has been added since last course review

- Feedback from students has been positive
Summary regarding Objectives

• Overall course objectives match course content well and are written in correct language

• We recommend considering specifying the “common lung diseases” referred to in objectives in order to assist with curriculum mapping

• Some session objectives are written in outdated language (e.g. “understand”) and need to be revised
Course Learning Opportunities

• Lecture 28.5 hrs. (54%), however:
  – 4 hours listed as “lecture” in ILIOS are actually patient presentations (7%)
  – 1 hour is large group ethics discussion (2%)
  – This reduces total lecture time to 45% of total
  – Many of the large group sessions are interactive (PFTs, “Tying it Together”)

• Conferences 9 hrs. (17%)
• Laboratory 9 hrs. (17%)
• PBL 6 hrs. (11%)
• E-lecture (2%)
Course Learning Opportunities

• Case conferences are very highly reviewed by students
  – Some students commented that exam questions were more difficult than conference questions

• Required Pulmonary Function Testing at DHMC also very well-received

• Some students suggested that labs should not be required since slides were available online
Summary regarding Pedagogy

• Course uses a balance of learning approaches

• Small group conferences and PFT lab were especially well-received

• Some students requested additional sessions to help with integrating complex material at the end of the course
Assessment

• Written Quizzes (No quizzes)
• Final Exam
• Conferences and short ethics essay
  – Conference grade based on attendance, participation
  – 9 conferences total. Each conference worth 2 points. (total – 18 points)
  – Short ethics essay worth 2 points.
  – Students must earn 16 of 20 possible points to pass

• Self Assessment Exams available on Canvas with answers provided mid-term.
Summary regarding Assessment

• Assessment structure is clear

• All objectives are assessed
  – Question arose about objective 20 (Educate patients and families about illness); this is assessed in asthma PBL

• Self-assessment is provided during course
### Measures of Quality – Step I

**SYSTEMS-BASED TOPICS**

<table>
<thead>
<tr>
<th>Topic</th>
<th>2012*</th>
<th>2013*</th>
<th>2014*</th>
<th>Means 12-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral sciences</td>
<td>0.43</td>
<td>0.26</td>
<td>0.15</td>
<td>0.28</td>
</tr>
<tr>
<td>Biostatistics, Epidemiology, Pop Health</td>
<td></td>
<td></td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Cardiovascular system</td>
<td>0.20</td>
<td>0.47</td>
<td>0.02</td>
<td>0.23</td>
</tr>
<tr>
<td>Endocrine system</td>
<td></td>
<td>0.39</td>
<td></td>
<td>0.39</td>
</tr>
<tr>
<td>Gastrointestinal system</td>
<td>0.32</td>
<td>0.59</td>
<td>0.54</td>
<td>0.48</td>
</tr>
<tr>
<td>General Principles of Found Sciences</td>
<td></td>
<td></td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Hematopoietic/lymph systems</td>
<td>0.14</td>
<td>0.18</td>
<td>0.09</td>
<td>0.14</td>
</tr>
<tr>
<td>Immune system</td>
<td>0.22</td>
<td>0.53</td>
<td>0.16</td>
<td>0.30</td>
</tr>
<tr>
<td>Multisystem Processes &amp; Disorders</td>
<td></td>
<td>0.23</td>
<td></td>
<td>0.23</td>
</tr>
<tr>
<td>Musculoskeletal, skin, CT systems</td>
<td>0.24</td>
<td>0.34</td>
<td>-0.02</td>
<td>0.19</td>
</tr>
<tr>
<td>Nervous system</td>
<td>0.25</td>
<td>0.21</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Nervous system and Behavioral Health</td>
<td></td>
<td></td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Nutrition</td>
<td>0.56</td>
<td>0.39</td>
<td>0.22</td>
<td>0.39</td>
</tr>
<tr>
<td>Renal/urinary system</td>
<td>0.42</td>
<td>0.21</td>
<td>0.23</td>
<td>0.29</td>
</tr>
<tr>
<td>Reproductive/endocrine systems</td>
<td>0.42</td>
<td>0.39</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Reproductive system</td>
<td></td>
<td>0.39</td>
<td></td>
<td>0.39</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>0.29</td>
<td>0.31</td>
<td>0.18</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*values reported for core disciplines are SD above the US/Can mean for Geisel mean scores
<table>
<thead>
<tr>
<th>Year 2 courses</th>
<th>Overall Satisfaction AY 2014-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI</td>
<td>4.47</td>
</tr>
<tr>
<td>Hematology</td>
<td>4.44</td>
</tr>
<tr>
<td>Infectious diseases</td>
<td>4.40</td>
</tr>
<tr>
<td><strong>Respiration</strong></td>
<td>4.38</td>
</tr>
<tr>
<td>Cardiology</td>
<td>4.27</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>4.20</td>
</tr>
<tr>
<td>FEK</td>
<td>4.19</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>4.15</td>
</tr>
<tr>
<td>Dermatology</td>
<td>4.11</td>
</tr>
<tr>
<td>Endocrine</td>
<td>4.09</td>
</tr>
<tr>
<td>CT &amp; Bone</td>
<td>3.62</td>
</tr>
<tr>
<td>Nervous system</td>
<td>3.46</td>
</tr>
<tr>
<td>Reproduction</td>
<td>3.29</td>
</tr>
</tbody>
</table>

scale [1=poor; 2=fair; 3=good; 4=very good; 5=excellent]
# Measures of Quality – Course Evaluation

*student participation rate on course evaluation*

<table>
<thead>
<tr>
<th>Measure</th>
<th>SBM Respiration 2012 (98.9%)</th>
<th>SBM Respiration 2013 (97.7%)</th>
<th>SBM Respiration 2014 (98.8%)</th>
<th>SBM Respiration 2015 (92.5%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall satisfaction of course</td>
<td>4.25</td>
<td>4.39</td>
<td>4.38</td>
<td>4.08</td>
</tr>
<tr>
<td>Clarity of learning objectives</td>
<td>4.11</td>
<td>4.41</td>
<td>4.34</td>
<td>4.01</td>
</tr>
<tr>
<td>Organization of the course</td>
<td></td>
<td>4.48</td>
<td>4.23</td>
<td>4.00</td>
</tr>
<tr>
<td>How well the course introduced me to this discipline</td>
<td>4.35</td>
<td></td>
<td>4.41</td>
<td>4.07</td>
</tr>
<tr>
<td>Congruence of assessment questions to material emphasized in course</td>
<td>3.58</td>
<td>3.88</td>
<td>3.92</td>
<td>3.55</td>
</tr>
</tbody>
</table>
Strengths:

- Conferences

*It was good that we had so many conferences. They were a lot of work to prepare for, but they kept me on top of thinking about diseases, some of which are quite complex.*

- Provided notes

*The typed notes (Word documents) were fantastic. I personally learn best from written notes and I appreciate that faculty took time to put them together. Small group reinforced important materials.*

- Dr. Manning, faculty’s willingness to help

- Organization of course and materials

*Very well organized, review materials succinct and relevant to final examination, Dr. Manning was very helpful in answering questions for our understanding.*
Measures of Quality – Student Comments

Strengths:

- Labs
  
  I really enjoyed the pathology labs. I felt like I walked out of each lab knowing what I needed to know.

  Going to the Spirometry lab was very helpful in understanding diagnostic testing

- Patient presentations
  
  The patient presentations were really wonderful. It is always interesting and more memorable to see a disease in the context of a person's life/journey.
Suggestions for Improvement:

- Practice questions for each lecture
  
  *If practice questions were given for each lecture, that would have been very useful.*

- Practice questions relevant to exam style (more clinical)
  
  *It really would’ve been helpful...to have given us problems or worksets that were more relevant to the exam style, especially in relationship to the complexity and minutia of peripheral pathologic symptoms.*

  *...i think we would only be better educated if the questions we practiced with at the small group sessions had the same level of difficulty/clinical reasoning as the exam. We didn't get enough practice with clinical reasoning.*

- Some parts of exam not taught in course
  
  *Practice final exam taught me an immense amount of material I did not learn in other parts of the course. Especially the paraplegic vs. quadriplegic vs. diaphragm paralysis problems. Perhaps students should be reminded to really learn the skills during On Doc to learn the physical exam cues for disease.*
Suggestions for Improvement:

- Condensed outline of course

A condensed outline of the course, including a list of diagnoses we are responsible for knowing, might have been helpful.

- Neonatology lecture

I think the neonatology lecture should be split into two separate lectures - one reviewing fetal circulation and the other the pathophysiology...also be okay if the review is simply the recording from year 1's lecture or an e-lecture recorded at the lecturer's convenience.

- Concept integration at end of course

I thought there could have been a little more time spent on integrating all the information at the end, either in small group or large group format.

Optional reviews

I wish there was an optional review or class geared to helping those of us who are not as strong in terms of physics.
Measures of Quality – Student Comments

Suggestions for Improvement:
- Alignment of faculty with course goals

I think that the culmination of the course, as constructed by Dr. Manning, in some ways was one analytical step above the level that the material had been presented at throughout the term. For instance, understanding the theory behind mechanisms of hypoxemia and hypercapnia in the major lung diseases was something that seemed to sort of pop out of nowhere. It's not to say that we didn't learn it at the end, but my only issue is that it was unsettling to feel like my own passes through the material (and, frankly, the original lecturers' presentations) lacked that component—which largely, they did. Squeezing those theoretical frameworks in at the end unfortunately cut short my time going back through and memorizing the itty bitty details, despite the fact that I took plenty of time to prepare (the most time of all my finals). I think there should be discussion between Dr. Manning and the faculty who teach COPD, etc. about how to start teaching to those objectives earlier on.

Some of the individual clinicians coming in are not very aligned with the rest of the course. Would have been nice for Dr. Manning to get a copy of each lecturer's powerpoint at the beginning of the course, and modify them to make them all congruent.
Measures of Quality – Student Comments

Did the faculty in this course provide a respectful environment for learning?

Absolutely. Questions were welcomed and faculty did a wonderful job teaching.

How well did the course explore these areas of culturally competent medical care when it had the opportunity to do so?

We had a session in PBL with an asthma patient at a free clinic, but then they proceeded to pull strings to get her free expensive tests. I think a small group session on diagnosis without PFT data would have been really useful.

What recommendations would you suggest to improve the Canvas site for this course?

Netpath materials should be more prominently advertised.
Summary regarding Student Feedback

• Students felt exam questions were more clinical than practice questions or small group conference questions
  – Requested more practice questions

• Students felt faculty were engaged and approachable, which was important for learning difficult concepts

• Students felt that access to some e-lectures to review complex year 1 material before corresponding sessions in year 2 would be helpful
Summary regarding Measures of Quality

• Course performs well on Geisel student evaluations and graduation questionnaire

• Students consistently score above the national average on respiratory topics on USMLE step 1
Recommendations

• Add examples of common respiratory diseases to course objectives
• Ensure that all session objectives are written in correct format
• Consider adding more practice exam questions
• Consider adding e-lecture to review difficult year 1 material prior to corresponding year 2 sessions
• Discuss student concerns (desire not to have these be required) about pathology labs with relevant faculty
Revised Course Objectives

1. Correlate pathological changes in the respiratory system with the accompanying physiological abnormalities in diseases such as asthma, COPD, cystic fibrosis, interstitial lung disease, and ARDS.

2. Correlate the pathological and physiological changes with the clinical manifestations of lung diseases, such as COPD, interstitial lung disease, asthma, pleural disease, and sleep apnea.

3. Explain the pathophysiology and treatment of common respiratory symptoms, such as cough and shortness of breath.

4. Interpret a variety of different types of pulmonary function tests, including spirometry, diffusing capacity, lung volumes, bronchoprovocation challenge, and MIP and MEP.

5. Describe how patterns of abnormal lung function characterize different respiratory disorders.

6. Measure one's lung function, predict how a variety of factors will affect the results of pulmonary function testing, and describe some of the difficulties and limitations of pulmonary function testing.

7. Describe basic radiographic findings in common respiratory disorders, such as emphysema, interstitial lung disease, lung cancer, ARDS, pleural effusion, pneumonia, and pneumothorax.

8. Explain how the physiological and pathological abnormalities that occur in patients with respiratory disease give rise to the symptoms experienced by patients and the physical findings (signs) that can be observed.
9. Describe the role played by genetic factors in common respiratory diseases, such as emphysema, asthma, and cystic fibrosis.

10. Describe the role played by environmental factors in common respiratory disorders, such as COPD, asthma, interstitial lung disease, and lung cancer.

11. Describe common developmental abnormalities of the respiratory system, such as congenital diaphragmatic hernia, tracheoesophageal fistula, pulmonary sequestration, and vascular rings.

12. Explain the pharmacological and non-pharmacological treatments for a broad range of respiratory diseases, such as COPD, asthma, interstitial lung disease, sleep apnea, lung cancer, and respiratory failure, and when possible correlate the treatment with the underlying pathobiology.

13. Describe the changes in lung function that occur during fetal development and during the transition from uterine to extrauterine life.

14. Explain the basic principles of screening and clinical epidemiology, particularly applied to lung cancer.

15. Describe factors that may limit the adoption and/or slow the implementation of new science to patient care or that limit patient compliance with recommended treatments.
16. Demonstrate the ability to piece together pieces of information from the history, physical examination, pulmonary function tests, and imaging studies to arrive at a list of the most likely diagnostic possibilities.

17. Describe basic ethical principles in medicine and apply them to decision making in patients with advanced lung disease or patients on ventilatory support.

18. Demonstrate the team skills by participating in small group conferences.

19. Demonstrate the responsibility for self-education.

20. Educate patients and families about illness.

21. Describe the impact of chronic respiratory disease upon patients and their families.
Action Plan

• Course objectives revised
• Will ensure that session objectives are all written in the correct format
• Will add additional practice questions in response to insatiable demand for more practice questions
• Will review time allotted to pathology sessions (MEC policy is that labs are required sessions)