Async Learning – Lessons Learned
From a leadserveinspire Curriculum Pilot

Doug Danforth, Ph.D.
Larry Hurtubise, M.A.

Part 1 Design Guidelines

- Design learning resources around defined objectives
- Significantly reduce the standard lecture with a faculty member and students in the lecture hall.
- Present (real time) turning-point sessions that have questions covering the objectives.
- Utilize case based clinical correlates
- Utilize several TBL sessions as part of the block evaluation process.

Additional Components

- Longitudinal Anatomy Curriculum
- Collaborate with CAPS for Clinical Skills Sessions
- Wiki for course packet
- USMLE Customized Assessment
- Turning Point Team Competitions
- Student-generated question bank
- Twitter for class communication

Curriculum goal: Design learning resources around defined objectives and provide multiple resources

- Handout with all objectives and several resources for each
- Suggested study schedule
- Dedicated web site with answers to objectives
- eLearning Modules

“What doesn’t kill us, makes us stronger”
Friedrich Nietzsche, 1888
Curriculum goal: Design learning resources around defined objectives and provide multiple resources

- Outcomes:
  - Studying from objectives vs lectures was challenging
  - Multiple learning resources led to confusion
  - On-line course packet was an unneeded change
  - eLearning Modules were highly rated
  - Require considerable time and effort
Curriculum goal: Reduce emphasis on lectures

- Traditional lecture hours reduced from 32 → 10
- Of 22 hours removed
  - 10h were replaced with TBL, CRIS, CPC
  - 12h were deleted
    • 2/3 basic science
    • 1/3 clinical content
- Total in-class time was reduced from 34h → 22h

Shift in emphasis

Learn first in class and go home to review notes
Study at home and come to class prepared for a higher level discussion

Reproduction and Development 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>Podcast Introduction to Pregnancy</td>
<td>CRIS - Maternal Planning in Pregnancy</td>
<td>TBL: Breast Disease</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>9:00</td>
<td>Introduction to Pregnancy</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>CRIS - Breast Disease</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>10:00</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>Lecture: Breast Disease</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>11:00</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>Lecture: Breast Disease</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>12:00</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>Lecture: Maternal Planning in Pregnancy</td>
<td>Lecture: Breast Disease</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
</tbody>
</table>

Outcomes:
- Significant challenge for students
  - “Block seemed disorganized”
  - Students struggled to identify important material
  - Three questions per hour of lecture
- Significant challenge for faculty

Many issues specific to pilot

Reproduction and Development 2011

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>9:00</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>9:30</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>10:00</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>11:00</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>11:30</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
<tr>
<td>12:00</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
<td>CGS: Breast Disease, Fetal Therapy, Fetal Medicine</td>
</tr>
</tbody>
</table>

Curriculum goal: Reduce emphasis on lectures

- Outcomes:
  - Significant challenge for students
    - “Block seemed disorganized”
    - Students struggled to identify important material
    - Three questions per hour of lecture
  - Significant challenge for faculty

Many issues specific to pilot
Curriculum goal: Provide interactive case-based clinical correlates to emphasize clinical reasoning and integration.

Developed three Clinical Reasoning and Integration Sessions (CRIS)

1) Introductory lecture followed by quiz questions
2) Case-based approach following single individual throughout reproductive lifespan
3) Students had to solve problems based around specific physiological concept (oxygen delivery to fetus)

Utilized Turning Point Team Competitions
1. Students worked in existing TBL teams and competed against classmates for fabulous prizes
2. No impact on grades

Outcomes:
1. CRIS Sessions were generally highly rated
2. Students wanted more questions during the sessions and additional information before class to prepare
3. TPTC were relatively low-yield

Other Curriculum Features

- Exams
  - USMLE Customized Assessment
  - Faculty generated exam
- Clinical Skills Sessions
  - Male GU
  - Female GU
  - Ultrasound
- Anatomy Sessions
  - Male and female pelvic anatomy prosections
- Student-generated questions
Part 1 Design Guidelines – How did we do?

- Design learning resources around defined objectives.
- Significantly reduce the standard lecture with a faculty member and students in the lecture hall.
- Present (real time) turning-point sessions that have questions covering the objectives.
- Utilize case based clinical correlates.
- Utilize several TBL sessions as part of the block evaluation process.

LSI Pilot - How did the students do?

- Overall class average = 87% 
  - Faculty exam = 82%
  - NBME Customized Exam = 92%
  - 2 failures

Summary

Faculty/Block Leader challenges

- Designing cohesive block of IP/ISP approaches was difficult
- CRIS/TBL – good options for active learning but ...
- Lecturers struggled
- Integration of knowledge and skills

Student challenges

- Prioritizing from objectives vs lectures was challenging
- Multiple learning resources was confusing

Key Points and Implications for Implementation

- Faculty change will be difficult
- Focus/limit learning resources
- Training and support for eLearning will be critical
- Standardization of content delivery may be important
- Integrating ISP and IP styles is challenging
Explain the endocrinology of the male reproductive system and the physiological processes of testosterone production and spermatogenesis

Learning Resources:
Rhoades and Bell (RB) Chapter 36
Web ME (ME) Study Unit 17 Male Reproductive Tract and Organs
Gartner and Hiatt, Textbook (H) pp. 481-510
Gartner and Hiatt, Atlas (A) Chapter 18
Second Life – Tour of the testis
Reproduction and Development Pilot Web – Male Reproductive/Endocrinology
Apseloff lecture – 3/2

Endocrine Regulation of Male Reproduction (RB 669-72)

Objectives:
1. List the important hormones of male reproduction and describe the functions of each. Describe the
   intracellular signaling (second messenger) systems for Gonadotropin Releasing Hormone (GnRH), the
   gonadotropins, and testosterone.
2. Describe the regulation of luteinizing hormone (LH) and follicle stimulating hormone (FSH) secretion by
   GnRH. Recognize that GnRH (and thus LH/FSH) secretion is pulsatile and that pulsatile GnRH secretion is
   REQUIRED for physiological LH and FSH secretion.

CLINICAL CORRELATE – GnRH analogs are used clinically to control gonadotropin secretion. GnRH agonists are
engineered to bind to the GnRH receptors and stimulate LH/FSH secretion. They also have a very long half-life.
GnRH antagonists are designed to bind to the GnRH receptor but not stimulate gonadotropin secretion – they
compete with endogenous GnRH for GnRH receptors on the pituitary gonadotropes and thus inhibit LH
secretion. GnRH antagonists are used to inhibit the negative effects of GnRH agonist treatment on Leydig cell and
spermatogonial cell function.