

Approaches to active learning; two medical schools make a start



Michael Parmely, Ph.D

Dept. of Microbiology, Molecular Genetics
& Immunology

Kansas University School of Medicine



VTC | Virginia Tech Carilion
School of Medicine and Research Institute

Susan Ely, Ph.D.

Department of Basic Science

Virginia Tech Carilion School of Medicine



Approaches to Active Learning in a Pre-Clinical Curriculum: A KU Experience

IAMSE Webinar 2014

Michael Parmely, Ph.D.

Department of Microbiology, Molecular Genetics
and Immunology
KU School of Medicine

Intention of this Session

- Describe the context for a model of active learning at Kansas
- Discuss primary goals of encouraging critical thinking, independent learning and clinical reasoning among MS1 students
- Discuss some variations on active learning strategies in a large classroom
- Describe some means of assessment

KU SOM Learning Environment

- Sole state medical school with class size of > 200 students
- 3-site campus connected by ITV
- Modular preclinical curriculum with first Fall term devoted to underlying fundamentals
- 4-week Inflammation and Immunity module in Oct-Nov

Foundations of
Medicine

Genetics and
Neoplasia

Inflammation
and Immunity

KU SOM Graduation Competencies

- **Patient Care:** assessment, diagnosis, management, prevention/promotion, skills
- **Medical Knowledge:** access, provide evidence, appraise
- **Practice-based learning/improvement:** refine, feedback, reflect, set personal objectives
- **Professionalism:** attitudes, behaviors, sensitivity, responsiveness, limitation, ethics
- **Systems-based practice:** team, health systems, error, solutions for community

What can be done in the first year of medical school?

- Developing these skills does not require a vast fund of knowledge; it requires inquisitiveness, patience and a learning framework.
- Independent engagement of students in active learning assignments facilitates skills development.

Assessment?

- How well do students manage complicated clinical case material?
- Where do they go for authoritative information?
- How do they develop an understanding of key diagnostic characteristics?
- How well do they apply mechanisms of disease to new clinical scenarios?
- Can they communicate what they have learned?

9 Steps in the Teaching/Learning Process

1. Define background study expectations
2. Provide an independent learning exercise (clinical case).
3. State pre-class student expectations: identify individual or team learning issues.
4. Assess student readiness to participate in class. Provide feedback.
5. State the specific case and session objectives.

9 Steps in the Teaching/Learning Process

6. Present the case in a large group setting.
7. Illustrate the desired skill.
 - Identifying learning issues and rich resources
 - Developing a problem list
 - Managing large sets of case information
 - Developing a concept map of pathogenesis
8. Provide a take-home exercise, typically another case.
9. Written post-class reports with assessment and feedback

Example: Transfusion Reaction

1. Reading and lecture review
2. Clinical case on transfusion reaction
3. Submit a set of 5 learning issues/objectives
4. Readiness: ABO antigens/antibodies and universal donors and recipients (web-clickers)
5. Objectives: Recognizing the signs and symptoms of an adverse event.
 - Clinical response
 - Understanding the genetics of ABO

Example: Transfusion Reaction

6. Present case in typical clinical format: CC, HPI, PMH, etc.
7. Skill: Linking presenting signs/symptoms to immune mechanisms of RBC destruction.
 - Nearest neighbor discussion about blood types
 - Constructing a concept map of pathogenesis
8. Take-home case of TRALI
9. Report: How do these mechanisms relate to solid organ rejection mechanisms?

Variations in the Process

- Stage of the learner: independence?
- Sequencing of skills development?
- Teaching/learning setting?
- Resistance to class attendance?
- Competition with podcasting?
- Individual versus group assignments?
- Time burden of assessment?
- Opportunities for narrative assessment

Constructing a concept map of disease pathogenesis

Connect the following terms or processes in a concept map to create a picture of disease pathogenesis.

- Foreign RBCs (foreign ABO)
- Anti-ABO antibodies
- Intravascular lysis of RBCs
- Released cellular debris
- Fever, pain, tachycardia and hypotension

Review of this Session

- Context at KU for this model of active learning
- Primary goals: critical thinking, independent learning and clinical reasoning
- *Assessment*
- Variations on active learning strategies in a large classroom

Expanding student-directed learning at Virginia Tech Carilion School of Medicine

IAMSE Webinar 16 January 2014

Susan Ely, Ph.D.

Department of Basic Science
Virginia Tech Carilion School of Medicine



Expanding student-directed learning at Virginia Tech Carilion School of Medicine

Session objectives:

Outline the VTCSOM MS1/MS2 learning environment

Describe the 2013 expansion of student-directed learning

Highlight surprises, successes & challenges



Virginia Tech Carilion School of Medicine

- **New school** - Charter class graduates May 2014
- **Very small** - 42 students per class
- **48% Basic Science curriculum = PCL/PBL**
Patient-centered Learning/Problem-based Learning for MS1/MS2
- **Pass/fail system; end-of block assessment**
(informal, formative assessments during blocks)
- **Curriculum is organ system-based;**
MS1 year = normal; MS2 year = pathological



VTCSOM MS1/MS2 learning environment

**Four Value Domains: Basic Science
Clinical Science
Research
Interprofessionalism**

**Basic Science curriculum = lecture 7 hours/week
lab/workshop 4 hours/week
PCL/PBL 10 hours/week**

As of 2013 MS2 → enhanced student-directed learning



Patient-centered Learning (PCL)/PBL at VTCSOM

7 students + 1 faculty facilitator/group

1 clinical case/week

**Students identify learning objectives;
each student presents to group twice weekly**

**Mon. 2 hours
Wed. 3 hours
Fri. 4 hours
(1h with patient)**



2013 Expansion of student-directed learning

MS2 year only

(Block V – Infectious disease, Pathology intro.,
Dermatologic disease, Genetic disease)

Voluntary faculty participation (2013):

traditional lecture *OR* asynchronous content delivery

3/15 faculty members chose asynchronous content
delivery



2013 Expansion of student-directed learning

Method of asynchronous content delivery 2013

Pre-recorded voice-over Powerpoint slides

- Mycology
- Parasitology
- Autoimmune disease
- Skin & Soft tissue Infections

Plan to add video pre-recorded sessions in 2014

In-class synthesis sessions – focus on clinical correlations

Q&A

Small-group problem-solving



2013 Expansion of student-directed learning

In 2013, for some lecture topics, students were provided with an additional choice for content consumption:

textbook assignments

pre-recorded content

in-class synthesis sessions

Results:

No change in attendance for synthesis sessions vs. lectures

No change in end-of-block exam results vs. 2012

Student response varied widely



2013 Expansion of student-directed learning

POSITIVE student responses

End-of-block evaluation: Asynchronous content delivery rated slightly higher than traditional content delivery

Availability of pre-recorded content was well-received.

Some students found this an improvement over lectures.



2013 Expansion of student-directed learning

NEGATIVE student responses

Quality of pre-recorded content was unsatisfactory to some.

Time needed for pre-recorded content was problematic.

Uncertainty regarding synthesis sessions was unsettling.



Challenges for 2014 and beyond...

Increasing faculty participation

- convincing reluctant colleagues
- providing suitable faculty development opportunities

Improving quality of pre-recorded content

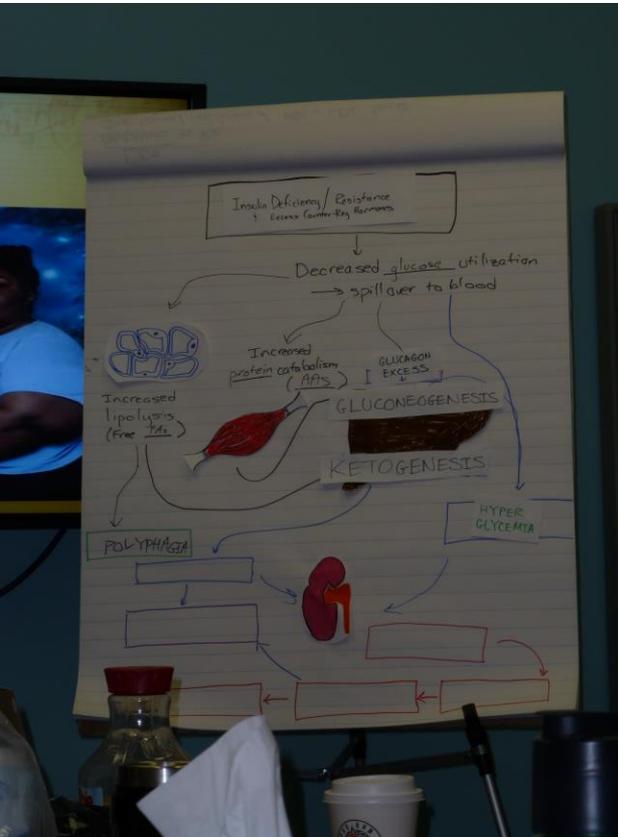
Providing excellent in-class synthesis sessions

Presenting expanded choices for student-directed learning *without* expanding required study time



In summary... this session described :

- The VTCSOM Basic Science PCL/PBL-intensive MS1/MS2 learning environment
- initial attempts at providing pre-recorded curricular content & in-class synthesis sessions in MS2
- results & challenges for the future



Thank you!

Questions?

