

Enhancing Problem-Based Learning by Inclusion of a Simulation Lab Experience

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CMBMP is an integrated course

Cellular and Molecular Basis of Medical Practice includes:

- Biochemistry
- Physiology
- Histology
- introductory
 - Pharmacology
 - Genetics
 - Molecular biology
 - Cell biology

A variety of teaching modalities are utilized in CMBMP

- Didactic lectures
- Problem-based learning (PBL)
 - One includes a simulation lab session
- Clinico-path correlates
- Web-based microscopy
- Team-based learning
 - Includes patient volunteers

PBL-Simulation session covers diabetic ketoacidosis (DKA)

- Related material covered in CMBMP lectures
- For the PBL, students meet for 7 hours over 3 days
- Simulation session is a separate hour
 - Students attend in PBL group
- Session developed in collaboration with MDs from our Simulation Center [Sim Healthcare 4: 232-6, 2009]

Simulation session integrates clinical material into first-year curriculum

Session run by MDs trained as simulation instructors

Interactive lecture and discussion

Case stem

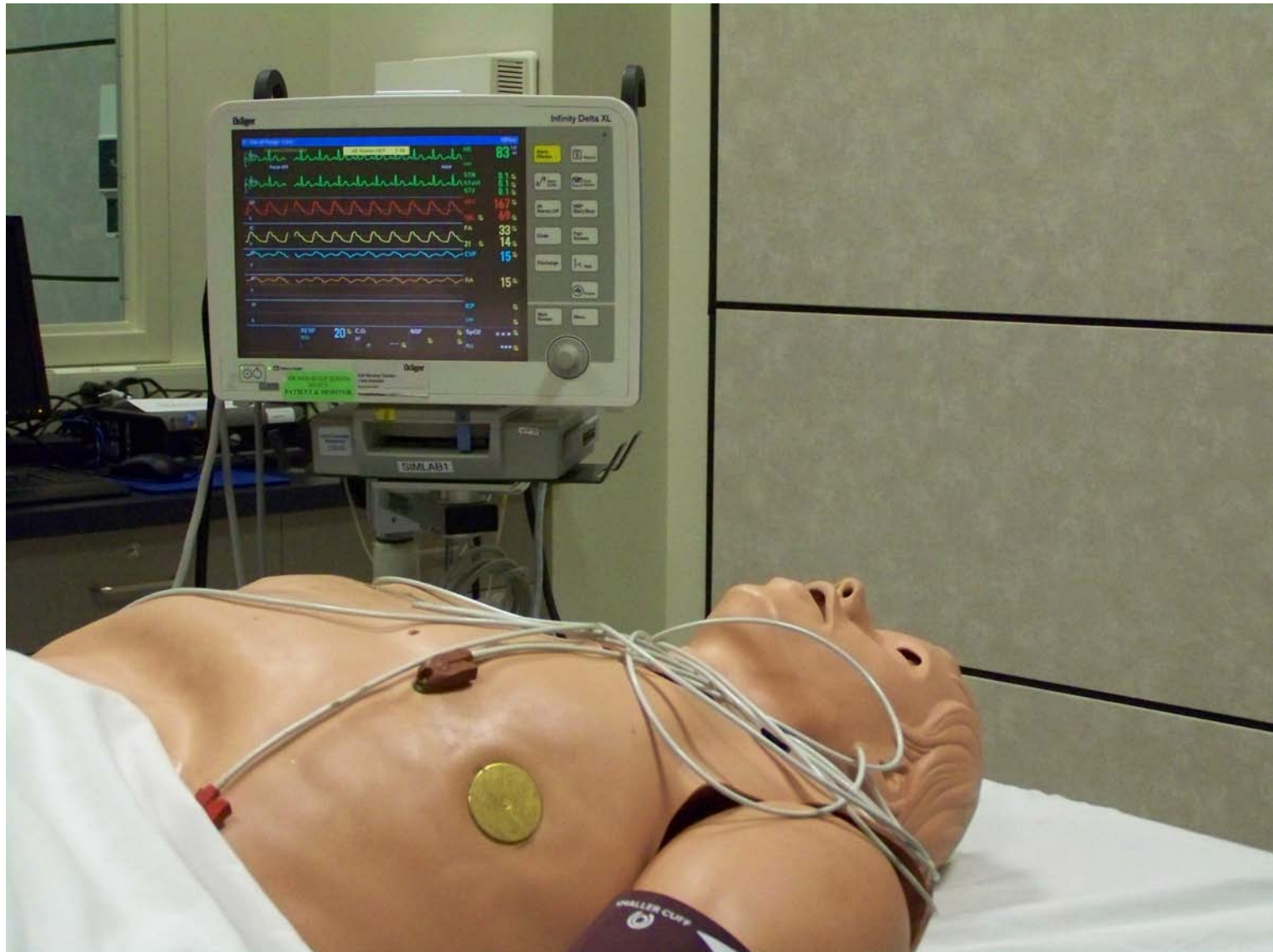
Toward the end of her soccer match, Tiffany develops nausea, extreme fatigue, mild disorientation, and blurred vision

Taken to Emergency Department by her boyfriend

Students see emergency room set up



Students learn about vital signs and see monitoring equipment



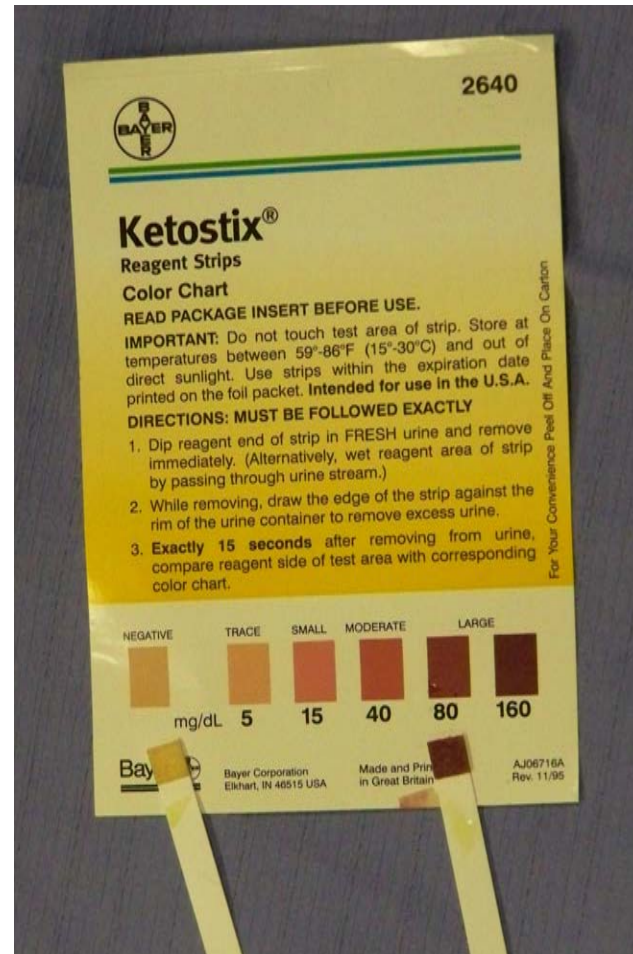
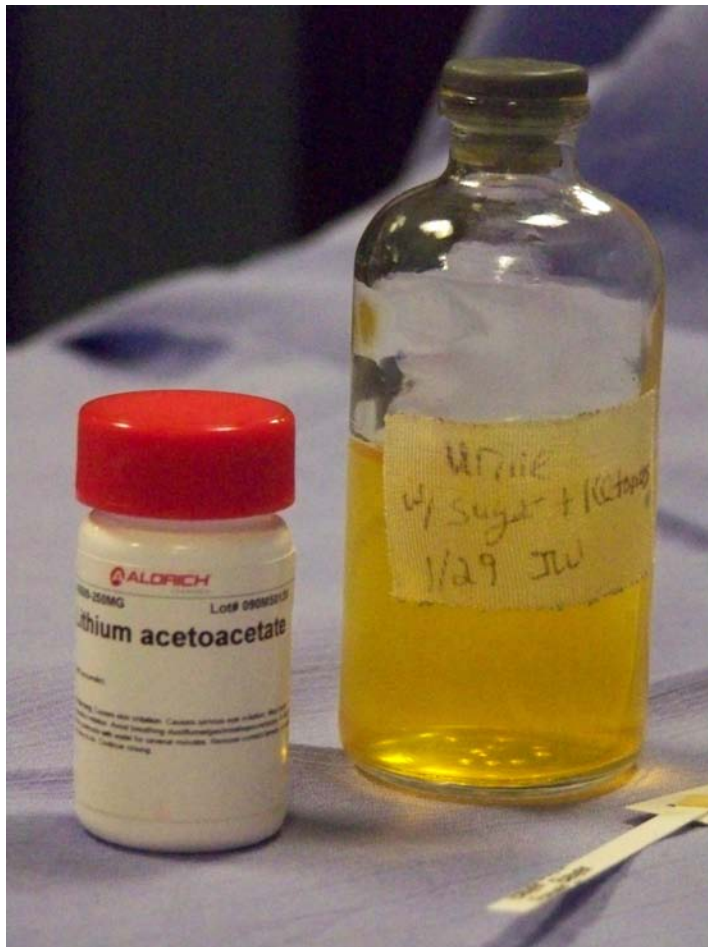
Students see how some medical procedures are performed



Students shown alternative ways to administer oxygen



Students run tests



Alcohol or ketone?



Students use a glucometer



Students see how insulin is administered



Initial presentation to volunteer students

- Very well received
 - Students suggested providing handout with
 - learning objectives
 - vital signs
- Incorporated into curriculum for entire class the following year
 - ~145 students in first-year class
 - 7 to 8 students per PBL group

Scheduling requires a lot of work

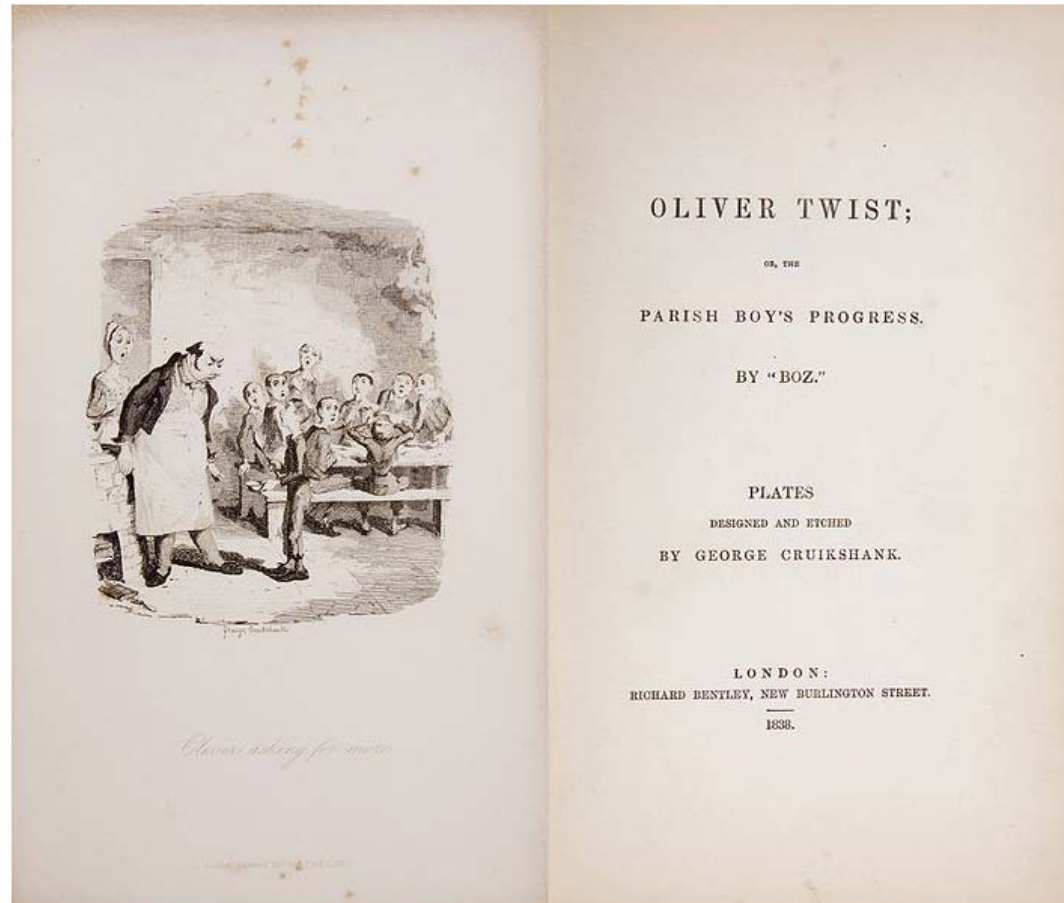
Time	MONDAY Jan. 31, 2011	TUESDAY Feb. 1, 2011	WEDNESDAY Feb. 2, 2011	THURSDAY Feb. 3, 2011	FRIDAY Feb. 4, 2011	
8-9		Humanities Discussion Groups	Simulation Lab	Evidence-Based Medicine Lecture	Simulation Lab	
9-10			Simulation Lab		Simulation Lab	
10-11	CMBMP Lecture	CMBMP Lecture	CMBMP Lecture	CMBMP Lecture	CMBMP Lecture	
11-12	CMBMP Lecture	CMBMP Lecture	CMBMP Lecture	CMBMP Lecture	CMBMP Lecture	
12-1						
1-2	Problem-Based Learning Groups		Problem-Based Learning Groups	Simulation Lab	Problem-Based Learning Groups	Simulation Lab
2-3		Simulation Lab		Simulation Lab		Simulation Lab
3-4		Simulation Lab		Simulation Lab		Simulation Lab
4-5	Simulation Lab	Simulation Lab	Simulation Lab	Simulation Lab	Simulation Lab	

Important to keep sessions on time

Four 15 minute blocks

Sections	Simulator State
I. Introduction	Baseline physiology; normal vital signs
II. History & physical exam	Presenting pathophysiology with signs of DKA
III. Initial therapy & diagnosis	Patient continues in DKA state
IV. Definitive therapy & conclusion	Patient vital signs improve after fluid resuscitation

Student evaluation: The *Oliver Twist* response



“Please, sir, I want some more.”

Should the simulation session vary?

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