



A Model for Problem Based Learning in Clinical Science Studies

David Hudson, David Barlow, and Robert Neeves
Department of Health, Nutrition, and Exercise Sciences



Project Description

- HESC 310 Anatomy and Physiology was a new course that was required for exercise science majors beginning the 2004 academic year.
- HESC 310 was designed to expand upon the content of HESC 220, which is open to all students in the Department of Health, Nutrition, and Exercise Science.
- This course was developed specifically for exercise science majors who must have a greater understanding of anatomy and physiology because most plan to pursue careers in the health professions.
- Problem based learning was utilized in this class, as students worked in 5-6 member groups, exploring realistic medical cases while using a variety of learning tools including:

- virtual-lab simulations
- cadaveric models
- palpation
- anatomy texts
- the internet

Purpose

To utilize problem based learning for teaching anatomy and physiology to students pursuing clinical careers in the medical professions.

Assessment of Students' Activities

- Group – lab report and 10-minute presentation
- Individual – revised lab report completed in group

Methods of Teaching

- Case studies of patients that would typically be seen by a physician or physical therapist.
- Students (groups of 5-6) were provided with the patients' subjective report and objective findings from a physical exam (figure 1). Their job was to diagnose the condition, describe the rationale for what lead them to their conclusions, and provide a treatment plan.
- Resources:
 - world wide web
 - reference texts and software
 - "hands-on" labs
 - anatomical models (figure 2)

Assessment of Teaching Method

Comparison of five multiple choice questions and one short essay that asked students to describe the joint motion and muscle activity of a complex task (overhand throwing).

Hands-On Learning



Student Feedback

Students replied that HESC310 challenged them more than HESC220. They said they learned a lot and felt very prepared and excited to continue their studies of physical therapy in graduate school.

Case: Left Shoulder Pain - 11/11/11 - 4-01 Right shoulder pain - 2/11/11

Subjective: Patient reports a 3 in pain history of right shoulder pain. She notes that pain is worse in the morning and throughout the day. She reports a popping noise during a full flexion of her right arm. The pain is exacerbated by a "strange pop" in the shoulder. She noted that a day after returning to partial flexion, she felt a popping noise in the shoulder joint. She notes that the popping noise and soreness occur during the movement. Within one week her pain returned to intensity from 3-6/10 with both overhand motions and any motion of the arm involving load on her right hand. She is unable to raise her arm overhead and is unable to perform any of the complex and changing motions of play. She also has difficulty lifting in the gymnasium. She has not taken any medications for this condition. She has been competitive in her sport since 1993 and has the same injury seen in high school but no longer runs due to right knee problems.

Objective: APT 100 BMI 17.0cm W 42.2 kg BP 118/67 HR 72

Medication: none

PMH: Right parathyroidectomy 2000-02, right parathyroidectomy 2003-2 (corrected to 0.8), thyroidectomy 2007, further hip replacement, bilateral parathyroidectomy (bilateral parathyroidectomy and right C5/6), bilateral parathyroidectomy (right-sided hemiplegia from a C7/C8 in 2010). Personal and family history has osteoporosis in both knees and the patient's grandfather has hypertension and angiodysplasia.

Physical Exam:

	R	L	NT	Strength	ROM
Cardinal Motion	4/5	4/5	4/5	4/5	4/5
— flexion	4/5	4/5	4/5	4/5	4/5
— extension	4/5	4/5	4/5	4/5	4/5
— abduction	4/5	4/5	4/5	4/5	4/5
— adduction	4/5	4/5	4/5	4/5	4/5
— internal rotation	4/5	4/5	4/5	4/5	4/5
— external rotation	4/5	4/5	4/5	4/5	4/5
— medial rotation	4/5	4/5	4/5	4/5	4/5
— lateral rotation	4/5	4/5	4/5	4/5	4/5
— pronation	4/5	4/5	4/5	4/5	4/5
— supination	4/5	4/5	4/5	4/5	4/5
— extension	4/5	4/5	4/5	4/5	4/5
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