Is My Pitching Career Over?: Instructor Guide

Title:

Is My Pitching Career Over?

Author:

Robert B Tallitsch
Department of Biology
Augustana College
Rock Island, IL 61201-2296
RobertTallitsch@augustana.edu

Marko Krpan

Brian Bratta, MS, ATC, CSC
Sports Medicine Team Leader
Ingham Regional Medical Center
3315 E Michigan Ave
Lansing, MI 4891

Discipline:

Biological Sciences

Target Audience

Advanced, majors

Keywords

Glenohumeral joint, kinesiology, rotator cuff, shoulder joint

Length of Time/Staging

Two class periods (with twenty minutes of class time dedicated to working on the problem) as well as four to six additional hours of work outside of class by the students.

Abstract

Tom, a 53-year-old, right hand-dominant male plays on a traveling "exhibition" fast-pitch softball team. He has been a fast-pitch softball player for most of his life, and has made an excellent living since joining the "Arizona Jesters", a traveling fast-pitch team that plays exhibition games against professional major league baseball teams (during spring practice) and regional championship-quality softball teams around the country. During the past six weeks Tom has noticed problems with some of the muscles of his shoulder, as well as a significant decline in his pitching accuracy and velocity.

The students are asked to (a) diagnose Tom's problem and (b) address how the problem will affect the kinesiology of Tom's shoulder joint.

Date Submitted

4/21/2004

Date Published

7/21/2004

Student Learning Objectives

This problem was written with the following summative objectives in mind:

1. Develop a better understanding of the kinesiology concepts involved in the normal functioning of the shoulder complex, including the following:
    1. Glenohumeral (GH)
    2. Scapulothoracic joint
    3. Understand the various roles that the pectoralis major, latissimus dorsi, teres major and subscapularis muscles play in normal range of motion (ROM) and stabilization of the GH joint.

This problem was written with the following formative objectives in mind:

1. Increase overall problem solving skills, including the ability to define problems, gather and evaluate information, and develop solutions.
2. Develop effective knowledge acquisition skills.
3. Develop better team skills.
4. Increase communication skills.
5. Increase self-assessment skills.
6. Increase ability to assess the work of others.
7. Increase ability to identify, find and use appropriate resources.

Assessment Strategies

This problem has been utilized in Human Anatomy classes with an enrollment ranging from forty to eighty students. Assessment has been both summative and formative.

Summative Assessment:

Summative assessment has been broken down into two formats. One format involves evaluation of both the group and individuals within the group. The following procedure is followed in evaluating individual and group progress on the PBL:

On the day the PBL is assigned the class will break up into PBL groups and do some preliminary work on the problem. By the next class session each PBL group member must turn in an individual hard-copy preliminary report. The preliminary report must contain the following:

- Possible hypothesis of what is wrong with the patient.
- What you will need to find out in order to prove or disprove your preliminary hypothesis, and where you will look to find this information.
- Any terminology that is not understood must be listed and defined, and the source of the definition cited.
- It is expected that each member of the group will review all of the group's preliminary hypotheses prior to coming to class the day the preliminary reports are due.

On the day the preliminary report is due the second part of the problem will be handed out. The class will again break into PBL groups and do further preliminary work on the problem. In this session the group will now:

- Determine how the additional information has changed any or all of the preliminary hypotheses, and why.
- Determine the course of action the group will take in order to solve the problem.
- Divide up the work that needs to be completed in order to solve the problem. The group leader will then post, in the group's Public Folder, a listing of what task is to be accomplished by what group member.

At the next class session (after distribution of part 2 of the PBL) each group member will turn in an individual hard-copy secondary preliminary report. (A copy will also be posted in the Public Folder). This secondary report must contain the following:

- Statement as to how your preliminary hypothesis of what is wrong with the patient has changed, and why.
- What you will need to find out in order to prove or disprove your newly formed hypothesis, and where you will look to find this information.
- Any new terminology that is not understood must be listed and defined, and the source of the definition cited.

As published in the course schedule, each group is required to submit a final report at the state of the appropriate class period. (It would be advisable for the group to keep at least one backup copy on computer disc.) The group report is to contain at least the following:

- Hypothesis of the solution to the problem.
- Sound anatomical reasoning to substantiate your hypothesis.

- Citations for any and all sources utilized, including your textbook.
- PBL reports will be graded on the anatomical accuracy of the final solution to the problem, as well as the anatomical logic utilized to arrive at the final solution.

A second form of summative evaluation is inclusion of material covered in the PBL on a "standard" lecture examination. The anatomical objectives may be assessed in the form of objective or essay questions.

Formative Assessment:

Formative assessment is accomplished two times during the course: at midterm and at the end of the course. Students are asked to fill out a form that assesses team and individual performance twice during the term. Individual growth throughout the term is assessed only at the end of the term.

Solution Notes

Solution removed.

References:

Inman et al. (1944) Observations of function of the shoulder joint. J. Bone Joint Surg [Br] 26:1

Lehmkuhl, L.D. & Smith, L.K. In: Brunnstrom's *Clinical Kinesiology (5th ed.)* Philadelphia: F.A. Davis.

Levangie, P.K. & Norkin, C.C. (2001) Joint structure and function. A comprehensive analysis. Philadelphia: F.A. Davis Company.

Perry, J. (1978) Normal upper extremity kinesiology. Phys Ter. 58:265

Poppen, N. & Walker, P. (1978) Forces at the glenohumeral joint in abduction. Clin. Orthop. 135:165.

Saha, A. (1961) Theory of shoulder mechanism: Descriptive and applied. Springfield: C.C. Thomas Publishers.

Sharkey, N. & Marder, R. (1995) The rotator cuff opposes superior translation of the humeral head. Am. J. Sports Med. 23:270-275.

Soderberg, G.L. (1997) Kinesiology. Application to pathological motion. Baltimore: Williams & Wilkins.

Sridharan, R. & Lorenzo, N. (2004) Focal Muscular Atrophies. Available from eMedicine. Retrieved 25 March, 2004 from the eMedicine website:http://www.emedicine.com/neuro/topic137.htm