Granny's Hip: Instructor Guide

Title:

Granny's Hip

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Discipline:

Biological Sciences

Target Audience

Intermediate, majors and nonmajors

Keywords

Anatomy

Length of Time/Staging

This problem will encompass two in-class sessions of approximately twenty minutes each. In addition, the problem will require students to do approximately four to six hours of out-of-class research (total) in order to solve the problem and answer the accompanying questions.

Abstract

You stop over to visit your grandmother for your weekly visit to set out her medications for the coming week. As you enter her apartment, you find her lying on her back in severe pain. She is

confused and does not recognize you when you enter the room. In addition, she is unable to tell you how she came to be lying on the floor. You try to help her up off of the floor, but she immediately complains of significant pain in the groin area. You dial 911 and an ambulance arrives. The students are walked through a two part problem that investigates the anatomy of the hip joint complex, the vasculature of the femur, and possible surgical interventions for repair of a fractured or dislocated hip.

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Student Learning Objectives

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

To increase the anatomical understanding of:

1. The anatomy of the hip joint complex.
2. The anatomy of the vasculature of the femur.
3. The musculature forces (active and passive) that act upon the hip joint.
4. At least one surgical procedure that may be utilized to repair a dislocated/fractured hip joint complex.

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.

Student Resources

A few titles that might be suggested to the students (assuming library availability) would be:

- *American Medical Association Complete Medical Encyclopedia* REF RC81 .A2 A497 2003
- *Atlas of Human Anatomy (Volumes 1 & 2)* Sobotta REF QM 25 .S6313 2001
- *Cognitive Neurosciences III* REF QP360.5 .N4986 2004
- *Current Medical Diagnosis and Treatment* REF RC71 .C976 2005
- *Dorland's Illustrated Medical Dictionary* REF R121 .D73 2003
- *Encyclopedia of Health and Behavior* REF R726.5 .E53 2004

- *Encyclopedia of Muscle and Skeletal Systems and Disorders* REF RC925.5 .S29 2005
- *Encyclopedia of Sports Medicin*e REF RC1206 .O355 2005
- *Encyclopedia of Women's Health* REF RA778 .E5825 2004
- *Gale Encyclopedia of Neurological Disorders* REF RC334 .G34 2005
- *Gray's Anatomy* REF QM23.2 .G73 2005
- *Gross Anatomy in the Practice of Medicine* Slaby REF ZM 23.2 .S525 1994
- *Handbook of Brain Theory and Neural Networks* REF QP363.3 .H36
- *Harrison's Principles of Internal Medicine* REF RC46 .H333 2005
- *Magill's Medical Guide* REF RC 41 .M34 2005
- *Mayo Clinic Family Health Book* REF RC81 .M473 2003
- *Melloni's Pocket Medical Dictionary* REF R121 .M54 2004
- *Merck Manual of Medical Information* REF RC81 .M535 2003
- *Muscular System* REF QP321 .M8965 2004
- *New Complete Medical and Health Encyclopedia* REF RC81 .A2N434 2003
- *Nurse's Drug Handbook* 2005 REF RM125 .N875 2005
- *Professional Guide to Diseases* REF RT 65 .P69 2001
- *Professional Guide to Signs and Symptoms* REF RC 69 .P77 2001
- *The Merck Manual* REF RC 55 .M4 1999
- Various Medical Dictionaries found at REF R 121

Instructor Resources

In the development of PBL problems, two web sites might prove valuable to a faculty member:

http://www.emedicine.com/

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi

Both of these web sites provide excellent search engines for clinical articles that can be utilized in the formulation of PBL problems or for background reading for further understanding of the clinical issues presented in this problem.

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 start 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.

Teaching Notes

Although each professor may choose to conduct Problem-Based Learning exercises in his or her own manner, the following list of teaching notes outlines how this author has utilized PBL problems in lower division Human Anatomy (for majors and nonmajors) and upper division Neuroanatomy (majors only) and Kinesiology (majors only) classes for more than fifteen years. These classes typically range in size from twenty to fifty students, with Human Anatomy being the largest of the classes.

1. Number of PBL Problems per term

PBLs are utilized between three to four times per term (ten week tri-semester course, with classes meeting MWF for 75 minutes or TTh for 120 minutes). Human Anatomy, being a lower-division class, typically involves 3 problems per term, with Neuroanatomy and kinesiology (both upper-division, majors only classes) involving four problems per term. Multiple-part problems in which additional information is provided to the students in each part have been found to produce the best results in these classes.

2. Teaching notes-student roles in the PBL process

This author has found that PBL groups function better when the students are randomly assigned to a PBL work group consisting of six students.

In order to help distribute the workload evenly for each problem throughout the term this author has found that it is best to have the students in each group choose a role to fulfill for each problem. The group roles that this author has found to be most helpful are outlined below:

- **Leader:** The PBL group leader serves several important functions. Among these functions are:
    - Facilitator of group meetings. The group leader is the one member in the PBL group that is to contact other members of the group and arrange meetings to work on the PBL sets.
    - Facilitator of group progress. The group leader will coordinate, in conjunction with the members in his/her group, the tasks to be completed by each member of the group. The group leader is responsible for e-mailing the

names of the group members who will be accomplishing each individual task to Bob within 24 hours of the day that the final part of the problem is distributed.
    - Facilitator of group problems. The group leader is the individual responsible for participation of group members. If the group feels that it has a member that is not participating adequately it is the responsibility of the group leader to bring this to my attention. At this time the group leader, individual in question, and I will meet and try to facilitate the problem. If necessary a meeting with the entire PBL group will be held to facilitate the problem.
    - The group leader is responsible for turning in the final written, hard copy answers to the PBL sets as well as posting the final report in the public folder.
- **Researcher:** These members (typically 3 when PBL groups are 6 in number) are responsible for doing research on the presented problem. (Note: It is important to inform the students that these are not the only members responsible for doing the research-rather they are the ones that will be responsible for coordinating the research and for doing the bulk of the research for the problem.) In addition, they are responsible for getting all information to the typists in a timely fashion.
- **Typist(s):** This member (or members, depending upon the size of the report) is/are responsible for typing some or all of the final report for submission. The typist is responsible for getting the final draft to the editor in a timely fashion for initial reading.
- **Editor:** This member works with other members of the group to determine what is, and isn't to be included in the final report. However, when a controversy develops, the editor has the final say.
- **Copy editor (proofreader):** This member is responsible for proofreading the final copy and getting all necessary corrections back to the typists in a timely manner. The typists are then to make any and all necessary corrections, and get a corrected copy to the copy editor. When all corrections have been made, the copy editor is responsible for getting the final copy to the group leader for submission on the day the report is required.

This author has also found that it is important to let the groups know that no group member may do the same task two problem sets in a row!

3. Teaching Notes-Time Required

Students are allotted twenty minutes of in-class work time each time a part of the problem is distributed. In addition students are given comp-time (approximately 50% of the class period) to work on the problem prior to the due-date for the assignment.

4. In-class organization and problem delivery, including student instructions:

The following has been determined, over a period of 15+ years of doing PBL learning exercises, to be the most effective delivery methodology for this author. Although the delivery methodology outlined below is labor intensive for the classroom instructor, it is the

most effective format for the students.

The PBL format utilized in these classes by this author is a modified-PBL format. No teaching assistants or permanent group facilitators are utilized with the groups, due to the inability to retain adequately trained group facilitators from term to term.

- On the day the PBL is assigned the class will break up into PBL groups and do some preliminary work on the problem in class. 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 (maximum of 2 pages in length, not counting bibliography).
    - 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.
    - Citations for any and all sources utilized, including your textbook. All reports (both preliminary and final reports) must involve a minimum of three references. A minimum of two different text references must be used for each report (both preliminary and final reports). Your required lecture text may be one of these text references. It is advised that your second text reference be obtained from the reference section of the library.
    - 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.
- One class period after 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 class. In this session the group will now:
    - Determine how the additional information has changed any or all of the preliminary hypothesis, 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 e-mail Bob a listing of what task is to be accomplished by what group member.
- At the next class session each group member will turn in an individual hard-copy secondary preliminary report (maximum of 2 pages in length, not counting bibliography). (A copy will also be posted in the Public Folder). This secondary report must contain the following:
    - If your preliminary hypothesis has changed you must state how your preliminary hypothesis has changed, and why. However, if your preliminary hypothesis has not changed, then you must state how the additional information has supported and clarified your preliminary hypothesis.
    - What you will need to find out in order to prove or disprove your current 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.
    - Citations for any and all sources utilized, including your textbook. All reports (both preliminary and final reports) must involve a minimum of three references. A minimum of two different text references must be used for each report (both preliminary and final reports). Your required lecture text may be one of these text references. It is advised that your second text reference be obtained from the reference section of the library.
    - A division of the work that needs to be completed in order to solve the problem, and who will accomplish each task. In addition to your listing of the group's division of labor in your secondary report, 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.
- Each group is required to submit a final report (maximum of five pages in length not counting bibliography) at the start of the appropriate class period, as indicated on the course outline. (Students are advised 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.
    - Answers to all questions raised in parts 1 and 2 of the PBL.
    - Citations for any and all sources utilized, including your textbook. All reports (both preliminary and final reports) must involve a minimum of three references. A minimum of two different text references must be used for each report (both preliminary and final reports). Your required lecture text may be one of these text references. It is advised that your second text reference be obtained from the reference section of the library.
- All material utilized in the construction of preliminary and final reports must be properly cited, both in the body of the PBL report as well as at the end, in a reference section, utilizing Council of Science Editors (CSE) Style.
- All reports (both preliminary and final reports) must involve a minimum of three references. A minimum of two different text references must be used for each report (both preliminary and final reports). Your required lecture text may be one of these text references. It is advised that your second text reference be obtained from the reference section of the library.

Solution Notes

Solution removed.