LSC Use Only Proposal No:	UWUCC Use Only Proposal No: 11-146
LSC Action-Date: App-3/29/12	UWUCC Action-Date: App-4/10/12 Senate Action Date: App-5/01/12

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s)	Email Address
David Pistole	**dpistole@iup.edu**
Proposing Department/Unit	Phone
Biology	**724-357-2612**

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

____ New Course ____ Course Prefix Change ____ Course Deletion

__X__ Course Revision ____ Course Number and/or Title Change __X__ Catalog Description Change

Current course prefix, number and full title: ***BIOL 118 The History of Pain***

Proposed course prefix, number and full title, if changing:

2. Liberal Studies Course Designations, as appropriate

__X__ This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

____ Learning Skills __X__ Knowledge Area ____ Global and Multicultural Awareness ____ Writing Intensive (include W cover sheet)

____ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

____ Global Citizenship ____ Information Literacy ____ Oral Communication

____ Quantitative Reasoning ____ Scientific Literacy ____ Technological Literacy

3. Other Designations, as appropriate

____ Honors College Course ____ Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

____ Catalog Description Change ____ Program Revision ____ Program Title Change ____ New Track

____ New Degree Program ____ New Minor Program ____ Liberal Studies Requirement Changes ____ Other

Current program name:

Proposed program name, if changing:

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)		2/10/12
Department Chairperson(s)		2/24/12
College Curriculum Committee Chair		3/28/12
College Dean		3/28/12
Director of Liberal Studies (as needed)		3/30/12
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs		4/10/12

Part II.

1. New Syllabus of Record

Catalog Description

BIOL 118 The History of Pain 3c-0l-3cr

Prerequisites: Non-Biology department majors and minors only

Despite its many individual, social, and cultural characteristics, pain is based on an anatomical and physiological foundation. The course will look at the history of scientific theories and hypotheses about understanding the pain mechanism. Through this type of study, students will learn about the status of pain in various societies throughout the ages. (Does not count toward Biology Electives, Controlled Electives, or Ancillary Sciences for Biology majors and minors.)

IIa. Course Outcomes and Assessment (Expected Undergraduate Student Learning Outcomes – EUSLO)

Objective 1:
Describe the general physiology of sensation as a means to interpret the physiology of pain.
Expected Student Learning Outcomes 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to have a level of knowledge of sensory physiology that will enable them to understand how pain mechanisms work. Assignments will also require students to critically analyze sensory modalities and to use this analysis to explain how pain is interpreted in our brains.

Objective 2:
Compare how pain has been perceived throughout the ages by identifying scientific and medical theories of that period.
Expected Student Learning Outcome 2:
Empowered Learners
Rationale:
Assignments will require students to evaluate scientific and medical theories (e.g. cell theory and anesthesia) throughout various time periods. In addition, these assignments will engage students in assessing a particular time's knowledge base in science and how that knowledge influenced the perception and treatment of pain for people of that time.

Objective 3:
Describe how pain is perceived and dealt with in today's society.

Expected Student Learning Outcome 3:
Responsible Learners
Rationale:
Assignments will require students to assess their own views of pain and how they compare to ethical judgments and social responsibilities in various societies around the world. They will also explore how their personal actions and civic values influence their perception of pain. Other assignments will have the students analyze pain issues in the public realm (e.g. national, state, or local) and to use this analysis to determine how their personal lives are and will be affected.

Objective 4:
Assess historical figures that have made contributions to our understanding of pain
Expected Student Learning Outcome 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to gain an understanding of how we have arrived at our current theories of pain by analyzing the contributions of individuals throughout history. They will then apply these analyses to the evaluation of their own view of pain.

III. Course Outline

A. Introduction - What is pain? (3 hours)
1. physiological
2. pathological
3. personal interpretations - where does it hurt?
4. do animals (other than humans) and plants feel pain

B. The Physiology of Sensation (7 hours)
1. neurological basis for sensation in humans
2. nervous system organization - peripheral and central nervous systems
3. nerve function - action potentials
4. receptor systems - generator potentials
5. pain receptors - how they work and various types
6. why an overload of "normal" receptors can equal pain

Exam 1 (1 hour)

C. Following pain through the ages - Earliest Recorded Examples of Pain (3 hours)
1. Introduction - ancient philosophy and pain: an overview
2. Ancient Greece - Hippocratic Collection, Homer, Sophocles
3. Egyptian medicine and Hellenistic culture in Alexandria
4. Roman medicine - Galen's observations
5. Pharmacology

D. Pain in the Middle Ages (3 hours)
1. Galenism
2. The four elements and four humors - scientific views in the middle ages
3. Arab influences
4. Eastern influences
5. Pharmacology

E. Pain in the Renaissance (3 hours)
1. The "birth of the individual" – Humoral foundations remain
2. The rebirth of anatomy – new scientific views of an old field
3. The development of professionals and specialists of medicine
4. Pharmacology

Exam 2 (1 hour)

F. Pain in the Classical Age (3 hours)
1. A turning point in history of medicine – Harvey – circulation of blood
2. Breaking the Galen legacy – new analytical methods
3. Theories of sensation
4. Pharmacology

G. Pain in the Age of Enlightenment (3 hours)
1. The three principal medical philosophies
2. The classification of pain into four principal types
3. The development of clinical medicine
4. Studies of the living fiber – repetition of experiments

H. Pain in the 19th century (4 hours)
1. Pain physiology – the great debate – central or peripheral nervous system
2. The specificity theory, the summation theory and the cellular theory
3. The isolation of morphine
4. The anesthesia revolution
5. Experimental physiology and the explanation of pain
6. Techniques in the fight against pain

Exam 3 (1 hour)

I. The early pain pioneers of the 20th century (3 hours)
1. Pain pioneers Bonica, Livingston, Noordenbos
2. Localization of pain centers
3. Sherrington and a new methodological approach
4. The theory of evolution and the language of pain

J. Pain in the latter half of the 20th century (3 hours)
1. A re-evaluation of pain's position in a global society
2. Pragmatic and multidisciplinary approaches
3. The gate control model

4. The physiopathology of pain

K. Current studies and models of pain management (4 hours)
1. American Pain Society – current guidelines
2. Discussion of selected papers from the National Academy of Sciences colloquium "The Neurobiology of Pain" December 11-13, 1998
3. Pain and the dying: the hospice movement and the work of Cicely Saunders
4. An overview of major contributors in the field of pain research today: Kathleen Foley, Ainsley Iggo, Ronald Melzack, Dame Cicely Saunders, Richard Sternbach, and Patrick Wall

Final exam (four) during final exam week (2 hours)

IV. Evaluation Methods

1. 60% Four examinations (15% for each exam) – three during the semester and a fourth during exam week. Exams will be short answer essays.

2. 20% Four case studies (5% for each exam) - Students will be given four case studies one for each of the following sections of lectures: 1-11; 12-20; 22-31; and 33-42. These case studies will have questions that must be answered and turned in by the student. Each case study will be worth 5% of the final grade.

3. 15% Students will develop one case study for the class. The case study will be based on articles and ideas gathered from sources such as newspapers, newsmagazines, and popular science and medical magazines (e.g. Discover Magazine, Science and Medicine or Journal of the American Medical Association). It will follow the format of the case studies given by the professor and will be worth 15% of their final grade. This will be a class assignment (no presentations in class).

4. 5% Critique of the non-textbook reading. Students will submit a critique with a maximum of five printed pages.

V. Grading Scale

Grading scale: A 90-100 B 80-89 C 70-79 D 60-69 F 59 and below

VI. Undergraduate Course Attendance Policy

The IUP attendance policy will be followed.

VII. Required Textbook

Rey, Roselyne. 1998. *The History of Pain* (Translated by Louise Wallace, J. A. Cadden and S.W. Cadden). ISBN 0674399684 Harvard University Press

Supplemental Non-textbook reading

Themstrom, Melanie, 2010. The Pain Chronicles: Cures, Myths, Mysteries, Prayers, Diaries, Brain Scans, Healing, and the Science of Suffering. ISBN 978-0-86547-681-3 Farrar, Straus and Giroux

Suggested Readings

Caruth, Cathy. 1996. *Unclaimed Experience: Trauma, Narrative, and History.* John Hopkins Univ Pr. ISBN: 0801852471

Mann, Ronald D. (Editor). 1988. *The History of the Management of Pain : From Early Principles to Present Practice.* Parthenon Pub Group. ISBN: 0940813270

Donnelly, Mark P. and Daniel Diehl. 2011. *The Big Book of Pain: Torture & Punishment Through Hisotry.* The History Press. ISBN 9780752459479

Dormandy, Thomas. 2006. *The Worst of Evils: The Fight Against Pain.* Yale University Press. ISBN 9780300113228

Loustaunau, Martha O. and Elisa J. Sobo. 1997. *The Cultural Context of Health, Illness, and Medicine.* Bergin & Garvey. ISBN: 0897895487

Morris, David B. 1998. *Illness and Culture in the Postmodern Age.* University of California Press. ISBN: 0520208692

Wolf, Jacqueline H. 2009. *Deliver Me from Pain: Anesthesia and Birth in America.* The Johns Hopkins University Press. ISBN 9780801891106

VIII. Special Resource Requirements

None

IX. Bibiliography

Adams, Raymond. 1996. *Principles of Neurology.* McGrawHill.

Brumback, Roger. 1996. *Neurology and Clinical Neuroscience.* Springer Verlag.

Caruth, Cathy. 1996. *Unclaimed Experience: Trauma, Narrative, and History.* Johns Hopkins Univ Pr.

Delvecchio Mary-Jo Good, et. al. 1994. *Pain As Human Experience: An Anthropological Perspective.* Univ. California Press.

Donnelly, Mark P. and Daniel Diehl. 2011. *The Big Book of Pain: Torture & Punishment Through History.* The History Press.

Dormandy, Thomas. 2006. *The Worst of Evils: The Fight Against Pain.* Yale University Press.

Frank, Arthur. 1997. *The Wounded Storyteller: Body, Illness, and Ethics.* Univ. of Chicago Press.

Guyton, Arthur and John Hall. 1996. *Textbook of Medical Physiology.* WB Saunders.

Guyton, Arthur and John Hall. 1997. *Human Physiology and Mechanisms of Disease.* WB Saunders.

Johnson, Leonard. 1998. *Essential Medical Physiology.* Lippincott Williams & Wilkins.

Kleinman, Arthur. 1989. *The Illness Narratives: Suffering, Healing, and the Human Condition.* Basic Books.

Kleinman, Arthur. 1997. *Writing at the Margin: Discourse Between Anthropology and Medicine.* Univ. California Press.

Loustaunau, Martha and Elisa Sobo. 1997. *The Cultural Context of Health, Illness, and Medicine.* Bergin & Garvey.

Malvin, Richard et.al. 1997. *Concepts of Human Physiology.* Addison Wesley Longman.

Mann, Ronald (editor). 1988. *The History of the Management of Pain : From Early Principles to Present Practice.* Parthenon Pub Group.

Marieb, Elaine. 2007. *Essentials of Human Anatomy & Physiology.* Addison-Wesley Pub Co.

Moffitt, Peggy et.al. 1993. *Human Physiology.* WC Brown.

Morris, David. 1993. *The Culture of Pain.* Univ. California Press.

Morris, David. 1998. *Illness and Culture in the Postmodern Age.* University of California Press.

Nowak, Thomas and Gordon Handford. 1994. *Essentials of Pathophysiology.* WC Brown.

Podolsky, Lawrence. 1997. *Cures out of chaos: how unexpected discoveries led to breakthroughs in medicine and health.* Harwood Academic Publishers.

Ranger, Terence and Paul Slack (editors). 1996. *Epidemics and Ideas : Essays on the Historical Perception of Pestilence (Past and Present Publications).* Cambridge Univ Pr.

Rey, Roselyne. 1998. *The History of Pain.* Harvard University Press.

Ritvo, Roger et.al. 1998. *Sisters in sorrow: voices of care in the Holocaust.* Texas A&M University Press.

Romanucci-Ross, Lola (editor) et.al. 1997. *The Anthropology of Medicine.* Greenwood Pub. Group.

Roth, Michael. 1995. *The Ironist's Cage : Memory, Trauma, and the Construction of History.* Columbia Univ Pr.

Rowland, Lewis (editor). 1995. *Merritt 's textbook of neurology.* Lea & Febiger.

Scarry, Elaine. 1987. *The Body in Pain: The Making and Unmaking of the World.* Oxford Univ. Press.

Squire, Larry R. 2008. *Fundamental Neuroscience 3rd ed.* Academic Press/Elsevier

Themstrom, Melanie, 2011. The Pain Chronicles: Cures, Myths, Mysteries, Prayers, Diaries, Brain Scans, Healing, and the Science of Suffering.

Tortora, Gerald. 2011. *Introduction to the Human Body 9th ed.* Wiley.

Vander, Arthur et.al. 1998. *Human Physiology.* WCB/McGraw-Hill.

West, John. 1999. *Best & Taylor's physiological basis of medical practice.* Lippincott, Williams & Wilkins.

Wolf, Jacqueline H. 2009. *Deliver Me from Pain: Anesthesia and Birth in America.* The Johns Hopkins University Press.

Part II.

2. Summary of the proposed revisions.

1. Objectives – the course objectives were revised from the original syllabus of record and aligned with the Expected Undergraduate Student Learning Outcomes (EUSLO) and Common Learning Objectives found in the criteria for a non-laboratory Natural Science course.

2. Common Learning Objectives for a non-laboratory Natural Science course are met in the content portion of the course (not necessarily a specific revision but it should be noted that the objectives for the new curriculum have been met). These objectives are:
   - examine a body of knowledge of natural science that will contribute to an understanding of the natural world and an appreciation of the impacts that natural sciences have on the lives of individuals and the world in which they live
   - understand the differences between science as a knowledge base and science as a process that generates knowledge
   - develop an inquiring attitude consistent with the tenets of natural science
   - understand the empirical nature of science
   - understand the concept of bias and the efforts to which scientists go to avoid it

3. Updated non-textbook reading to a more current book. Note: there are no newer textbooks on this subject (History of Pain).

4. Updated suggested readings with more current publications (3 of 7 readings).

5. Added seven more current citations to the bibliography.

6. The language of the prerequisites and the catalog description was changed to clearly reflect the fact that this is a Liberal Studies offering in biology.

Part II.

3. Justification/Rationale for the revision.

The course is a currently approved Liberal Studies Non-Laboratory Natural Science course and is being revised to meet the new curriculum criteria for this category.

Part II.

4. Old syllabus of Record

Syllabus BIOL 118

The History of Pain

3 credits
3 lecture
0 lab
(3c-01-3sh)

Despite its many individual, social, and cultural characteristics, pain is based on an anatomical and physiological foundation. The course will look at the history of scientific theories and hypotheses about understanding the pain mechanism. Through this type of study, students will learn about the status of pain in various societies throughout the ages.

Objectives

1. The student will be able to understand the physiology of pain by gaining knowledge about how the human nervous system works. Students will gain a better understanding of the general physiology of sensation through this approach.

2. The student will be able to understand how pain has been perceived throughout the ages by understanding scientific and medical theories of that period. Since the written word is the bases for our understanding of pain in past times the course will concentrate on Western culture.

3. The student will be able to understand how pain is perceived and dealt with in today's society.

4. The student will be able to learn of important people throughout the ages who have made contributions to our understanding of pain.

Lecture Topic Outline

This sequence is based on three one-hour lectures a week for 14 weeks for a total of 42 lectures

3 Lecture hours — Introduction - What is pain
- a. physiological
- b. pathological
- c. personal interpretations - where does it hurt?
- d. do animals (other than humans) and plants feel pain

7 Lecture hours — The Physiology of Sensation
- a. neurological basis for sensation in humans
- b. nervous system organization - peripheral and central nervous systems
- c. nerve function - action potentials
- d. receptor systems - generator potentials
- e. pain receptors – how they work and various types
- f. why an "overload" of normal receptors can equal pain

1 Lecture hour — Exam 1

3 Lecture hours — Following pain through the ages - Earliest Recorded Examples of Pain
- a. Introduction - ancient philosophy and pain: an overview
- b. Ancient Greece - Hippocratic Collection, Homer, Sophocles
- c. Egyptian medicine and Hellenistic culture in Alexandria
- d. Roman medicine - Galen's observations
- e. Pharmacology

3 Lecture hours — Pain in the Middle Ages
- a. Galenism
- b. The four elements and four humors - scientific views in the middle ages
- c. Arab influences
- d. Eastern influences
- e. Pharmacology

3 Lecture hours — Pain in the Renaissance
- a. The "birth of the individual" - Humoral foundations remain
- b. The rebirth of anatomy - new scientific views of an old field
- c. The development of professionals and specialists of medicine
- d. Pharmacology

1 Lecture hourExam 2

3 Lecture hours — Pain in the Classical Age
- a. A turning point in history of medicine - Harvey - circulation of

blood
b. Breaking the Galen legacy - new analytical methods
c. Theories of sensation
d. Pharmacology

3 Lecture hours — Pain in the Age of Enlightenment
a. The three principal medical philosophies
b. The classification of pain into four principal types
c. The development of clinical medicine
d. Studies of the living fiber - repetition of experiments
e. Pain therapeutics

4 Lecture hours — Pain in the 19th Century
a. Pain physiology – the great debate – central or peripheral nervous system
b. The specificity theory, the summation theory and the cellular theory
c. The isolation of morphine
d. The anesthesia revolution
e. Experimental physiology and the explanation of pain
f. Techniques in the fight against pain

1 Lecture hour Exam 3

3 Lecture hours — The early pain pioneers of the 20th century
a. Pain pioneers Bonica, Livingston, Noordenbos
b. Localization of pain centers
c. Sherrington and a new methodological approach
d. The theory of evolution and the language of pain

3 Lecture hours — Pain in the latter half of the 20th century
a. A re-evaluation of pain's position in a global society
b. Pragmatic and multidisciplinary approaches
c. The gate control model
d. The physiopathology of pain

4 Lecture hours — Current studies and models of pain management
a. American Pain Society - current guidelines
b. Discussion of selected papers from the National Academy of Sciences colloquium "The Neurobiology of Pain" December 11-13,1998
c. Pain and the dying: the hospice movement and the work of Cicely Saunders
d. An overview of major contributors in the field of pain research today: Kathleen Foley, Ainsley Iggo, Ronald Melzack, Dame Cicely Saunders, Richard Sternbach, and Patrick Wall

Final Exam 4 during final exam week.

Methods of evaluation

1. There will be four examinations during the course. Each will be worth 15% of the student's final grade for a total of 60% of the final grade. Exams will be short answer essays.

2. Students will be given four case studies one for each of the following sections of lectures: 1-11; 12-20; 22-31; and 33-42. These case studies will have questions that must be answered and turned in by the student. Each case study will be worth 5% of the final grade for a total of 20% of the final grade.

3. Students will develop one case study for the class. The case study will be based on articles and ideas gathered from sources such as newspapers, newsmagazines, and popular science and medical magazines (e.g. Discover Magazine, Science and Medicine or Journal of the American Medical Association). Articles available exclusively on the Internet will not be allowed to be submitted. It will follow the format of the case studies given by the professor and will be worth 15% of their final grade. This will be a class assignment (no presentations in class).

4. Students will submit a critique with a maximum of five printed pages of the non-textbook reading. The critique will be worth 5% of the final grade.

5. Grading scale: A 90-100 B 80-89 C 70-79 D 60-69 F 59 and below

Textbook

Rey, Roselyne. 1998. *The History of Pain* (Translated by Louise Wallace, J. A. Cadden and S.W. Cadden). ISBN 0674399684 Harvard University Press

Non-textbook reading

One of the following

* Good, Delvecchio Mary-Jo *et. al.* 1994. *Pain As Human Experience: An Anthropological Perspective.* Univ. California Press. ISBN: 0520075129
* Morris, David B. 1993. *The Culture of Pain.* Univ. California Press; ISBN: 0520082761
* Scarry, Elaine 1987. *The Body in Pain: The Making and Unmaking of the World.* Oxford Univ. Press. ISBN: 0195049969

Suggested Readings

Caruth, Cathy 1996. *Unclaimed Experience: Trauma, Narrative, and History.* Johns Hopkins Univ Pr. ISBN: 0801852471 Loustaunau, Martha O. and Elisa J. Sobo. 1997. *The Cultural Context of Health, Illness, and*

Medicine. Bergin & Garvey. ISBN: 0897895487 Mann, Ronald D. (Editor). 1988. *The History of the Management of Pain : From Early Principles to Present Practice.* Parthenon Pub Group. ISBN: 0940813270 Morris, David B. 1998. *Illness and Culture in the Postmodern Age.* University of California Press. ISBN: 0520208692 Ranger, Terence (Editor) and Paul Slack (Editor). 1996. *Epidemics and Ideas : Essays on the* Historical Perception of Pestilence (Past and Present Publications). Cambridge Univ Pr. ISBN: 052155831X Roth, Michael S. 1995. *The Ironist's Cage: Memory, Trauma, and the Construction of History.* Columbia Univ Pr. ISBN: 0231102453

Bibiliography

Adams, Raymond. 1996. *Principles of Neurology.* McGrawHill.

Brumback, Roger. 1996. *Neurology and Clinical Neuroscience.* Springer Verlag.

Caruth, Cathy. 1996. *Unclaimed Experience: Trauma, Narrative, and History.* Johns Hopkins Univ Pr.

Delvecchio Mary-Jo Good, et. al. 1994. *Pain As Human Experience: An Anthropological Perspective.* Univ. California Press.

Dowling, John. 1992. *Neurons and Networks : An Introduction to Neuroscience.* Belknap Pr.

Frank, Arthur. 1997. *The Wounded Storyteller: Body, Illness, and Ethics.* Univ. of Chicago Press.

Guyton, Arthur and John Hall. 1996. *Textbook of Medical Physiology.* WB Saunders.

Guyton, Arthur and John Hall. 1997. *Human Physiology and Mechanisms of Disease.* WB Saunders.

Johnson, Leonard. 1998. *Essential Medical Physiology.* Lippincott Williams & Wilkins.

Kleinman, Arthur. 1989. *The Illness Narratives: Suffering, Healing, and the Human Condition.* Basic Books.

Kleinman, Arthur. 1997. *Writing at the Margin: Discourse Between Anthropology and Medicine.* Univ. California Press.

Loustaunau, Martha and Elisa Sobo. 1997. *The Cultural Context of Health, Illness, and Medicine.* Bergin & Garvey.

Malvin, Richard et.al. 1997. *Concepts of Human Physiology.* Addison Wesley Longman.

Mann, Ronald (editor). 1988. *The History of the Management of Pain : From Early Principles to Present Practice.* Parthenon Pub Group.

Marieb, Elaine. 1997. *Human Anatomy & Physiology.* Addison-Wesley Pub Co.

McLeod, James et.al. 1995. *Introductory Neurology.* Blackwell Science Inc.

Moffitt, Peggy et.al. 1993. *Human Physiology.* WC Brown.

Morris, David. 1993. *The Culture of Pain.* Univ. California Press.

Morris, David. 1998. *Illness and Culture in the Postmodern Age.* University of California Press.

Nowak, Thomas and Gordon Handford. 1994. *Essentials of Pathophysiology.* WC Brown.

Podolsky, Lawrence. 1997. *Cures out of chaos: how unexpected discoveries led to breakthroughs in medicine and health.* Harwood Academic Publishers.

Ranger, Terence and Paul Slack (editors). 1996. *Epidemics and Ideas : Essays on the Historical Perception of Pestilence (Past and Present Publications).* Cambridge Univ Pr.

Rey, Roselyne. 1998. *The History of Pain.* Harvard University Press.

Ritvo, Roger et.al. 1998. *Sisters in sorrow: voices of care in the Holocaust.* Texas A&M University Press.

Romanucci-Ross, Lola (editor) et.al. 1997. *The Anthropology of Medicine.* Greenwood Pub. Group.

Roth, Michael. 1995. *The Ironist's Cage : Memory, Trauma, and the Construction of History.* Columbia Univ Pr.

Rowland, Lewis (editor). 1995. *Merritt 's textbook of neurology.* Lea & Febiger.

Scarry, Elaine. 1987. *The Body in Pain: The Making and Unmaking of the World.* Oxford Univ. Press.

Tortora, Gerald. 1994. *Introduction to the Human Body.* Harper Collins.

Vander, Arthur et.al. 1998. *Human Physiology.* WCB/McGraw-Hill.

West, John. 1999. *Best & Taylor's physiological basis of medical practice.* Lippincott, Williams & Wilkins.

The History of Pain

BIOL 118. The History of Pain 3c-01-3sh

Prerequisite: Non-biology and non-biology education majors and non-biology minors only.

Despite its many individual, social, and cultural characteristics, pain is based on an anatomical and physiological foundation. The course will look at the history of scientific theories and hypotheses about understanding the pain mechanism. Through this type of study, students will learn about the status of pain in various societies throughout the ages.

Answers to Liberal Studies Questions

A. Not applicable. A single instructor will teach the course.

B. The majority of contributions by women in the field of pain have come in the past century. Specifically, in the last portion of the class we will discuss the contributions of two of the major contributors in the field of pain research - Dame Cicely Saunders and Kathleen Foley. Another aspect including women will be a section about pain and dying and the work of Cicely Saunders and the hospice movement. Some of the selected papers from the National Academy of Sciences colloquium will also be by women. In addition, a woman writes the textbook we will be using and two of the three non-textbook readings available (one will be chosen) are by women. Finally, two of the four case studies will incorporate women and minorities as part of the study.

C. The students will be required to read one of the following books: *The Culture of Pain* by David B. Morris; *Pain As Human Experience: An Anthropological Perspective* by Delvecchio Mary-Jo Good, et.al; or *The Body in Pain: The Making and Unmaking of the World* by Elaine Scarry. These books will provide a different approach for students than the lectures by describing how pain is viewed by various cultures throughout the world. These books primarily focus on the individual's view of pain.

D. This is an introductory course. It differs from our non-majors beginning courses (General Biology I) by focusing on one theme - pain rather than the entire realm of biology. In addition, the General Biology I course does not cover any physiology or neurobiology.

Answers to Course Analysis Questionnaire

A1. The course is a three credit non-laboratory science course that would be a part of the 4-3-science option of the liberal studies requirements. It will be exclusively for non-biology or biology education majors.

A2. This course does not require a change in any existing course or program.

A3. This course has never been offered at IUP.

A4. The course will not be a dual-level course.

A5. The course will not be offered for variable credit.

A6. I am not aware of any other higher education institutions currently offering this course.

A7. No, the content of this course is not recommended or required by a professional society, accrediting authority, law or other external agency.

B1. The course will be taught by one instructor.

B2. The content of this course does not overlap that of any courses offered in other departments. Although pain might be discussed in other courses the historical aspects and their relationship to scientific and medical theories of the age are not.

B3. There will be seats in this course for students in the School of Continuing Education.

C1. Faculty resources are currently adequate.

C2. Resources for this course are adequate.

- Space - Classroom space is available and adequate.
- Equipment - Overhead projectors and computer outlets and projectors are available.
- Laboratory Supplies and other Consumable Goods-Not applicable-lecture course.
- Library Materials - The Stapleton library has adequate resources of reading materials to support the course.
- Travel Funds - None needed.

C3. None of the resources for this course are funded by a grant.

C4. Every spring semester.

C5. One section.

C6. Student enrollment will be limited by the size of the room where the class is held.

C7. No professional society recommends enrollment limits or parameters for this course

History of Pain - Assignment 4 (4% of grade)

1. Read the following article.
2. Answer the following three questions:
    1. Why would doctors be concerned about operating on a comatose patient - why would the patient be worried about being unconscious?
    2. Why do you think there was such a battle over the acceptance of anesthesia at this time?
    3. Based upon the essay - how do you think physicians viewed pain before and after anesthesia?
3. Grading Rubric:

1% - You gave no (or very little) observations, background material or what you gave was inappropriate to support your answer.
2% - You gave some observations and background material, but it is either too little, incorrect, or didn't provide a context for your answers.
3-4% You provided observations and background material that provide a context for your answers.

This is an essay from "Military Medical and Surgical Essays Prepared for the United States Sanitary Commission edited by William A. Hammond, M.D. Surgeon-General U.S. Army, etc. Philadelphia: J.B. Lippincott & Co., 1864. PAIN AND ANAESTHETICS by Valentine Mott, M.D.

Among the many improvements which characterize modern surgery, one of the most invaluable is the introduction of Anaesthetics. That we should be enabled safely and conveniently to place the human system in such a state, that the most painful operations may be performed without consciousness, is to have secured to man immunity from what he most dreads; for most men fear pain even more than death. When seeking death by suicide, the instinctive aversion to pain is apt to govern in the choice of means, and the person generally selects the method which he imagines will inflict upon him the least suffering.

Pain humbles the proudest and subdues the strongest. It was the great agent of the Spanish inquisition, because it was more effective to extort confession than death itself. It was pain that made Cæsar weep; and I have seen the most heroic and stout-hearted men shed tears like a child, when enduring the anguish of neuralgia. As in a powerful engine when the director turns some little key, and the monster is at once aroused, and plunges along the pathway, screaming and breathing forth flames in the majesty of his power, so the hero of a hundred battles, if perchance a filament of nerve is compressed, is seized with spasms, and struggles to escape the unendurable agony. We have then this, the first reason for the use of anaesthetics:-

To prevent pain is humane. No gentlemen, not to say Christian, would needlessly inflict pain on any creature. It was, indeed, a certain kind of humanity which led the Athenians to execute Socrates by means of a narcotic draught, and which also made the Romans give their malefactors, during crucifixion, drugged wine. Even the guillotine had its conception in a kind of humane sentiment. Only savages inflict upon their victims the horrors of torture. And I do not believe that there is a surgeon of the nineteenth century who would willingly inflict any unnecessary pain in his operations if once practically acquainted with the means of prevention, and once confident and facile in their use.

But, secondly: *Pain is useless to the pained.* So Galen said centuries ago, and so the late

discussions of the question of anaesthesia have abundantly proved; and if any members of the medical profession still entertain the idea that pain may have some occult, mysterious use, with which it would be dangerous to dispense, we must remember that the general sentiment of our profession, together with the common sense of mankind, is now unquestionably far in the advance.

The torment of toothache and the griping of colic confer no benefit on the sufferers; and all experience proves that the step proper to be taken first in the cure of these diseases is to relieve the pain.

When the pain produced by a surgical operation, or by any other injury, is excessive, the exhaustion is greater, reaction comes on more slowly, the subsequent process of restoration is delayed, and the tendency to depression is increased. The practice of applying irritating applications and stimulating, plasters to phlegmons has long been confined to the ignorant - the educated surgeon preferring soothing poultices and sedative lotions. But this reason may be made stronger; since

Pain is positively injurious to the pained. If sufficiently acute and long continued, it will of itself produce death. The collapse which follows severe injuries, where there is little loss of blood, is to be attributed entirely to pain. Whm death occurs in such cases without reaction, it is the direct effect of pain.

Ambrose Paré, the father of modem surgery, in speaking of pain, says, "nothing so much dejects the powers of the patient." Gooch says, "mere pain can destroy the powers of life." My friend, Mr. Travers, observes, "pain, when amounting to a certain degree of intensity and duration, is of itself destructive." And I myself, like every other surgeon in active practice, am continually witnessing injuries where death results solely from the nervous shock.

In corroboration of this fact, we may notice, *en passant,* the Statistics of Amputations, collected by Professor Simpson, of Edinburgh. It is not necessary to quote them at length, but they come, by numeric process, to this conclusion - that in all serious surgical operations the prevention of pain, by the use of anaesthetics, gives to the patient not only present relief, but also a better prospect of subsequent recovery - the mortality in such cases being clearly lessened by the use of anaesthetics. We see, then, that pain has the effect, primarily and directly, to depress the powers of life.

If we inquire into the cause of this, we shall find it in the physiological law, that the *nervous system controls the vascular,* and the collapse which attends severe injuries has its origin in the nervous system. Collapse is a provision for defending the nervous centers from an intolerable assault, and in this way does nature herself in a manner dictate the use of anaesthetics. It was probably in supposed obedience to this indication that John Hunter, great and ingenious even in his errors, advocated amputation before reaction had occurred. He meant to avoid the nervous shock.

In collapse, the return of nervous energy precedes the restoration of the circulation; and, admitting all that is claimed for the chemical origin of the forces that produce the circulation of the blood, we must still allow that the current is controlled and directed by nervous influence. The most severe operation during anaesthesia produces little or no effect upon the pulse, because the nervous centers receive little or no impression.

Whatever, then, may be the physiological necessity for pain, though its uses in the animal economy may be to prevent lesion and deter from danger, we are here to view the question merely in a therapeutic light, and to conclude that pain is only evil, and that continually. And now, how shall it be prevented? Obviously by any means which will produce a less injurious effect. We are

not required to possess an absolutely innocuous agent; if the injurious effect of the means used be less than that of the pain prevented, we are justified in employing them.

If we examine these doctrines carefully, we shall find that they are in fact not essentially new. The principles on which they are founded have been long recognized *in the use of narcotics.* I was in the habit of giving opiates freely before the introduction of anaesthetics, both before and after operations; and now, after over fifty years of experience, I still retain them in my confidence, for their power to relieve pain after operations, thus improving the condition of the patient, and favorably modifying the subsequent inflammation. In the treatment of certain painful affections, such as puerperal fever or peritonitis, opium is well known not only to be palliative, but directly curative. Richter called it "the grand antiphlogistic remedy."

It has always been used more freely by surgeons in this country than in Europe, and to this cause I attribute, in great measure, our lesser subsequent mortality. And opium and its preparations are the only anodynes well adapted to surgical use. No substitutes are worthy of confidence.

When chloroform or ether is to be used, it is not advisable to give an opiate previous to the operation, as to do so would increase the tendency to subsequent vomiting, which every experienced surgeon is anxious to avoid. When the system is laboring under the shock of any newly-received and severe injury, the powers of life are in abeyance, and the act of retching tends to an unfortunate issue. In collapse, if the patient vomit, he is apt to die.

In case of hare-lip, however, and in operations about the mouth and jaws and nose, we are frequently compelled to depend, as formerly, upon narcotics for preventing or mitigating the pain, as the locality renders inhalation impracticable.

After operations, opiates are to be used, without much reference to quantity in proportion to the severity of the pain. The only injurious effect of their too free exhibition would be after some hours a little irritability of the stomach. Their constipating tendency in such cases is of no therapeutic importance, and would in no degree increase the subsequent local inflammation.

Alcoholic stimulants are also well known to exercise a limited anaesthetic power. Men in a condition of complete intoxication are sometimes unconscious of the injuries they receive, and formerly some surgeons were in the habit of benumbing of the sensibility of the patient, and sometimes I fear their own, by copious draughts of spirituous liquors. But this practice can, at best, produce but very imperfect anaesthesia, and intoxicating drinks are still more apt to disturb the stomach than opium. I well remember a case of amputation of the thigh which occurred a few years since in my own practice, where the attending physician, notwithstanding repeated cautions, administered brandy to the patient so freely as to induce vomiting, thus interfering with the continuance of the reaction, and inducing a fatal result. It was an extensive cannon shot of the knee-joint, and on the third day from the injury, before the collapse had sufficiently passed off.

But opium and alcohol have been referred to, rather as illustrations of the truth of the principles of anaesthesia than as practicable anaesthetic agents. To produce any considerable insensibility with them would require their use in quantities and for a length of time that could not fail to be seriously injurious to the nervous system. Days would be required to recover from their narcotic effect. Hence it is, that such agents are of little account when compared with inhalations.

The great extent of the pulmonary surface, and the facility with which aeriform agents may be introduced through it into the circulation - their complete efficiency and their ready evacuation by respiration - conclusively indicate that the lungs, instead of the stomach, is the best route through which to introduce the proper agents for inducing insensibility. Now, the question arises, can these

advantages be secured without danger to the patient? And sufficient time has already elapsed to enable us to reply: *Anaesthetics, when properly used, are perfectly safe.*

At the period of my last visit to Europe, some ten years since, Professor Simpson had then given chloroform to over 8000 persons without a single fatal result from its use, and by this time he has, no doubt, more than duplicated that experience. In the Crimean war, it was used commonly and freely. Baudens speaks of several thousand cases in which it had been used without accident, and Macleod reports over 20,000 cases, with only a single fatality. Even when ignorantly and carelessly employed, there is less danger than is commonly apprehended. When last in Paris, I saw it used continually, and freely, and carelessly, with little precaution to dilute the vapor, and by rude means, - a sort of bag tied over the mouth and nose of the patient, - yet heard of no case of asphyxia from its use. Both chloroform and ether are continually employed in this city, [New York,] in the hospitals and public institutions, as well as in private practice, with little or no regard to either the quantity or intensity of the vapor, and yet but very few accidents have occurred. In my own practice, I have never seen a death from their use.*

But there is another reason for employing anaesthetics which must not be forgotten. *The insensibility* of the patient is a *great convenience to the surgeon.* How often, when operating in some deep, dark wound, along the course of some great vein, with thin walls, alternately distended and flaccid with the vital current, - how often have I dreaded that some unfortunate struggle of the patient would deviate the knife a little from its proper course, and that I, who fain would be the deliverer, should involuntarily become the executioner, seeing my patient perish in my hands by the most appalling form of death! Had he been insensible, I should have felt no alarm.

By the use of anaesthetics, also, the shrieks and cries of the patient are prevented; so that the surgeon's powers are not additionally taxed, either to nerve himself to a very unpleasant task, or to control and encourage the attendants.

This discovery, then, has not only taken from surgery its greatest horrors, but it has also very much increased the facility and safety of operations; and in this way the *domain of surgery is extended.*

In the removal of tumors with intricate surgical relations, the operator now feels at liberty to take the amount of time required for careful and slow dissection. He performs painful operations on children with little or no fear of subsequent convulsions, and the nervous and timid are so protected from the shock that he is free to assert the dominion of the knife wherever science has decreed and the powers of the human constitution will allow.

Summary view: In the 1800s, most people expected to experience pain in their lives and relied on religion or personal fortitude to help them endure it. Pain was one of God's punishments for the wicked and purifying trials for the good; for the woman in labor, pain was the spiritual experience that would transform her into a self-sacrificing mother. Many doctors shared these views! Other physicians were concerned about the ethics of operating on a comatose patient and many were concerned about the potential risk of death from an overdose of anesthetic.