

11-31

Senate Info - 10/11/11

Undergraduate Distance Education Review Form

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

Existing and Special Topics Course

Course: BIOL 118 The History of Pain

Instructor(s) of Record: Dr. David Pistole

Phone: 7-5715 or 7-2612 Email: dpistole@iup.edu

Step Two: Departmental/Dean Approval

Recommendation: Positive (The objectives of this course can be met via distance education)

Negative

[Handwritten Signature]

Signature of Department Designee

9/16/11

Date

Endorsed:

[Handwritten Signature]

Signature of College Dean

9/21/11

Date

Forward form and supporting materials to Liberal Studies Office for consideration by the University-wide Undergraduate Curriculum Committee. Dual-level courses also require review by the University-wide Graduate Committee for graduate-level section.

Step Three: University-wide Undergraduate Curriculum Committee Approval

Recommendation: Positive (The objectives of this course can be met via distance education)

Negative

[Handwritten Signature]

Signature of Committee Co-Chair

9/28/11

Date

Forward form and supporting materials to the Provost within 30 calendar days after received by committee.

Step Four: Provost Approval

Approved as distance education course

Rejected as distance education course

[Handwritten Signature]

Signature of Provost

9/28/11

Date

Forward form and supporting materials to Associate Provost.

Received

SEP 28 2011

Liberal Studies

Received

SEP 22 2011

Liberal Studies

Undergraduate Distance Education Review Form

(Required for all courses taught by distance education for more than one-third of teaching contact hours.)

Existing and Special Topics Course

Course: The History of Pain

Instructor(s) of Record: David H. Pistole

Phone: 7-5715 or 7-2612 Email: dpistole@iup.edu

Step One: Proposer

A. Provide a brief narrative rationale for each of the items, A1- A5 after the signature pages.

1. How is/are the instructor(s) qualified in the distance education delivery method as well as the discipline?

I have attended IUP workshops on LMS instructional technology for both WebCT and D2L. I have created projects for Liberal Studies using Captivate 5. In the late 1990's I received a NSF ILI grant for a server to use on-line resources in my Principles of Biology I course. I developed my own delivery system with quizzes and lecture and laboratory resources such as Cells Alive and the lab manual. About four years after IUP began using WebCT it caught up to what I had done on my own server and I switched over to it at that time. The instructor has met with the university Online Learning Specialist (David Porter) to discuss this course.

In terms of qualifications for the discipline I have been teaching biology at IUP since 1983 and have a PhD from Indiana State University.

2. How will each objective in the course be met using distance education technologies?

General overview: For each module associated with the objectives, students will watch narrated lectures (10 minutes or less), review chapters in the text book, read various essays, and have both small group and full class discussions on the LMS forum. Each module will have self-tests to gauge their progress. The first module self test must be passed to move onto the second module (this requirement is only for the first module). Assignments will be submitted and exams taken on the LMS. The instructor will interact through the LMS Chat and Forum as well as through SKYPE, e-mail and the telephone. Activities for each module will require students to post responses to the LMS forum for asynchronous interaction with the professor. Students will also be divided into smaller groups for forum and Chat line discussions (synchronous) with the professor for each module. Students will take self-tests and a final exam (LMS based) consisting of multiple choice questions. Answers will be posted on the LMS.

Objective 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.

Students must gain an understanding of how the human body perceives sensations such as pain. This understanding provides a basis for the rest of the course as students explore scientific and medical theories of pain throughout the ages. This module involves basic neurobiology and is best delivered through short narrated lectures and animations on the LMS. There will be a self-test that

must be passed on the LMS. There will be opportunities for all students to interact synchronously with the professor through Chat, SKYPE or the telephone. One assigned reading with questions and a virtual lab exercise (cocaine and rats) will also be given with answers and a lab report submitted on the LMS. Students will also be divided into smaller groups for Forum (asynchronous) and Chat line discussions (synchronous) with the professor for each module.

Objective 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.

This objective will be met primarily through readings in the textbook and short lectures delivered on the LMS that will allow the students to follow the development of our understanding and perception of pain throughout the ages. Assignments from these readings will be made with similar delivery and submission procedures as listed under Objective 1. Small group forum and chat discussions will follow as described under Objective 1. Self-tests will be delivered on the LMS to test their progress in this area.

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

Students will take a pain assessment survey on the first day of class which has them describe their level of understanding of the nature of pain. The same survey will be then be given during the last module with small group and full group discussions to follow. As in Objective 2, a series of readings with associated assignments will be given. Students will develop a case study (sample will be available on LMS) based on some aspect of pain of their own choosing. The non-textbook reading will also cover this objective. Students will turn in a critique of one other student's case study as well as a critique of the supplemental reading to the LMS.

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

Students will once again be reading a series of articles and chapters in their text book about these historical figures with associated assignments similar to those listed under the other objectives.

3. How will instructor-student and student-student, if applicable, interaction take place?

Chat - the instructor will have set times as well as any specific times a student will need for synchronous chat. Times will be posted in the LMS. Different dates and times will be used to ensure all students can participate.

Forum – the instructor will use the forum for asynchronous interactions with the students through assignments and questions.

The instructor will also be available by telephone and SKYPE.

4. How will student achievement be evaluated?

1. 15% Final Exam – multiple choice questions
2. 20% Self test – four modules with associated self-test – 5% each – multiple choice questions

3. 20% Assignments – five assignments – 4% each – these involve the reading of various materials and answering questions about the materials
4. 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.
5. 3% Peer review of case study – One page review of another student's case study
6. 17% Forum Discussions – First four modules 3% each and fifth module 5%. Forum discussions will involve both small group and the entire class. Every assignment as well as the virtual lab and case study will be discussed on the forums.
7. 10% Critique of the non-textbook reading. Students will submit a critique with a maximum of five printed pages.

5. How will academic honesty for tests and assignments be addressed?

Papers will be checked for plagiarism using Turnitin. All written work will also carry an academic integrity clause. Tests will be timed.

- B. Submit to the department or its curriculum committee the responses to items A1-A5, the current official syllabus of record, along with the instructor developed online version of the syllabus, and the sample lesson. This lesson should clearly demonstrate how the distance education instructional format adequately assists students to meet a course objective(s) using online or distance technology. It should relate to one concrete topic area indicated on the syllabus.

BIOL 118 The History of Pain

Distance Education Syllabus

(3c-01-3cr)

Dr. David H. Pistole: 326 Weyandt
724-357-2612 dpistole@iup.edu

Online Office Hours: TBA

Prerequisites: Non-Biology majors, 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.

Course Outcomes:

Upon completion of the course students will be able to:

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.

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

Required Technology Skills and Software Technology Skills

Students enrolled in this course should possess the following technology skills

1. The ability to access information via the Web
2. The ability to use the learning management system and associated tools, including discussion/chat, quizzing, and assignment submission features
3. The ability to use word processing software and to save in Rich Text Format
4. The ability to use Internet communication tools, specifically e-mail
5. 4. If using SKYPE (free software) student will need a web cam or video camera.
6. The ability to demonstrate netiquette (appropriate online conduct)

Required Software

You will need the following software to participate in all course activities. You can download these software for free if you do not currently have them.

Adobe Reader (<http://get.adobe.com/reader/>)

Flash Player (<http://get.adobe.com/flashplayer/>)

Technical Support

To obtain technical support for computer issues related to this course, please contact Indiana University of Pennsylvania's student helpdesk at 724-357-4000 between 7 a.m. and 5:30 p.m. Eastern Time. You should be prepared to give specific details regarding your technical issue(s), including what you were doing before the error occurred and the exact text of any error messages received.

If you experience issues outside of the normal helpdesk hours, you can also submit your error via e-mail at it-support-center@iup.edu or via electronic form available online at <http://www.iup.edu/page.aspx?ekfrm=36009>.

Participation Requirements

Course modules will be assigned according to the Course Schedule and include objectives, lesson guide, and expectations for completing homework assignments. You are expected to actively participate in all aspects of the course. This includes completion of assigned readings, homework assignments, and tests or quizzes and participation in online discussions. Each course module runs for three days for a total of five modules. 11:59 of the third day is the deadline for making posts/submitting the assignments. All work assigned for the module must be turned in by this deadline; late work will not be accepted. It is suggested that you read through all course content in the assigned module to get a feel for what is expected and to help you plan your time wisely.

You must have one original post and two responses to other student's posts for each of the five modules. You are also expected to read all postings for the module's discussions. The instructor will be assigning groups to serve as the weekly discussion leaders. This means prior to your group's assigned module, you will want to prepare your discussion items so that you are ready and can post to the discussion boards as close to the beginning of the module as possible.

Online Etiquette

This section includes my expectation of how students will conduct themselves during this course.

1. Discussion, chat, and e-mail spaces within this course are for class purposes only, unless otherwise stated. Please remember to conduct yourselves professionally. Unlike in the classroom setting, what you say in the online environment is documented and not easily erased or forgotten.
2. Avoid using ALL CAPS, sarcasm, and language that could be offensive.
3. Read all posting before posting your response so as to not repeat information.
4. Keep posting brief and to the point.
5. Focus on one topic at a time when posting or replying to posts.

Student with Disabilities

If you are a student who has a documented disability and need special accommodations, the instructor will work with you to provide reasonable accommodation to ensure you a fair opportunity to perform in the class. Please advise the instructor in the first week of the semester regarding the disability and the desired accommodations. Assistance for individuals with disabilities is available through IUP Disability Support Services at <http://www.iup.edu/disabilitysupport> or at 724-357-4067.

Academic Integrity Policy

Indiana University of Pennsylvania expects a full commitment to academic integrity from each student. This syllabus represents a contract between you and the instructor of this course and that you agree to follow the rules and expectations set up therein. Academic integrity means:

- Providing or receiving unauthorized assistance in coursework, including papers, quizzes, and examinations.
- Using unauthorized materials and resources during quizzes and tests.
- Possessing course examination materials without the prior knowledge of the instructor.
- Plagiarizing, using papers, dissertations, essays, reports, speeches, and oral presentations, take-home examinations, computer projects, and other academic exercises or passing off of ideas or facts beyond common knowledge, without attribution to their originators.
- Engaging in behaviors that are disruptive or threatening to others.
- Using computer technology in any way other than for the purposes intended for the course.

Please note that the IUP faculty uses a variety of technologies to check the authenticity of student work. Violations of academic integrity will be handled per IUP's Academic Integrity Policy and Procedures. Failure to comply with the policies and procedures may result in a decrease in grade, involuntary withdrawal from an academic program, suspension, expulsion, or rescission of a conferred degree. IUP's full policy on academic integrity is available in the Undergraduate Catalog under Academic Policies at <http://www.iup.edu/registrar>.

Student Evaluation

1. 15% Final Exam – multiple choice questions
2. 20% Self test – four modules with associated self-test – 5% each – multiple choice questions
3. 20% Assignments – five assignments – 4% each – these involve the reading of various materials and answering questions about the materials
4. 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.
5. 3% Peer review of case study – One page review of another student's case study
6. 17% Forum Discussions – First four modules 3% each and fifth module 5%. Forum discussions will involve both small group and the entire class. Every assignment as well as the virtual lab and case study will be discussed on the forums.
7. 10% Critique of the non-textbook reading. Students will submit a critique with a maximum of five printed pages.

Grading Scale

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

Course Schedule – for 3 week winter or summer school session

Module 1: The Physiology of Pain – Days 1-3

1. Complete survey – your perception and understanding of pain
2. Watch lectures 1 and 2 on the physiology of pain
 - What is pain?
 - Physiological
 - Pathological
 - Personal interpretations - where does it hurt?
 - Do animals (other than humans) and plants feel pain?
 - The Physiology of Sensation
 - Neurological basis for sensation in humans
 - Nervous system organization - peripheral and central nervous systems
 - Nerve function - action potentials
 - Receptor systems - generator potentials
 - Pain receptors - how they work and various types
 - Why an overload of "normal" receptors can equal pain
3. Virtual Lab – Cocaine and Rats – complete the virtual lab and turn in the lab report associated with the exercise.
4. Forum posting: Questions associated with the article "Measuring Pain" – small group discussion/response on day 2; day 3 whole group discussion/response. Also "your view of pain – discussion of your current perception and understanding of pain.
5. Assignment 1: Read article – The puzzle of pain and answer questions
6. Topic for case study must be chosen
7. Self-test – must pass to move on to next module

Module 2: Following pain through the ages – Earliest examples through Renaissance – Days 4-6

1. Read Chapters 1-3 in textbook
2. Watch lecture 3 – Pain from antiquity to ancient Egypt and lecture 4 - Pain in ancient Greece, Rome and India
 - Earliest Recorded Examples of Pain
 - Ancient philosophy and pain: an overview
 - Ancient Greece - Hippocratic Collection, Homer, Sophocles
 - Egyptian medicine and Hellenistic culture in Alexandria
 - Roman medicine - Galen's observations
 - Pharmacology
 - Indian medicine
 - Watch lecture 5 Pain in the Middle Ages.
 - Galenism
 - The four elements and four humors - scientific views in the middle ages
 - Arab influences
 - Eastern influences
 - Pharmacology
 - Watch lecture 6 - Pain in the Renaissance
 - The "birth of the individual" – Humoral foundations remain
 - The rebirth of anatomy – new scientific views of an old field
 - The development of professionals and specialists of medicine
 - Pharmacology
3. Forum posting: Questions associated with the article "The Four Humors" - small group discussion/response on day 5; day 6 whole group discussion/response.
4. Assignment 2: Read article - Medieval Medical Misconceptions – write 1 page

summary paper of your thoughts on the paper.

5. Assignment 3: Read article – Acupuncture a Brief History of Qigong – answer questions.
6. Self-test

Module 3 – Pain from the Classical Age to the 19th Century – Days 7-9

1. Read Chapters 4-6 in Textbook
2. Watch lecture 6 – Pain in the Classical Age
 - A turning point in history of medicine – Harvey – circulation of blood
 - Breaking the Galen legacy – new analytical methods
 - Theories of sensation
 - Pharmacology
- Watch lecture 7 - Pain in the Age of Enlightenment
 - The three principal medical philosophies
 - The classification of pain into four principal types
 - The development of clinical medicine
 - Studies of the living fiber – repetition of experiments
- Watch lecture 8 - Pain in the 19th century
 - Pain physiology – the great debate – central or peripheral nervous system
 - The specificity theory, the summation theory and the cellular theory
 - The isolation of morphine
 - The anesthesia revolution
 - Experimental physiology and the explanation of pain
 - Techniques in the fight against pain
3. Forum posting: Questions associated with the article “The History of Inhalational Anesthesia – small group discussion/response on day 8; day 9 whole group discussion/response.
4. Assignment 4 – Read essay from "Military Medical and Surgical Essays" – answer questions.
5. Rough draft of case study due
6. Self-test

Module 4 – Pain from 1900's to today – Days 10-12

1. Read Chapter 7 in Textbook
2. Watch lecture 9 - The early pain pioneers of the 20th century
 - Pain pioneers Bonica, Livingston, Noordenbos
 - Localization of pain centers
 - Sherrington and a new methodological approach
 - The theory of evolution and the language of pain
- Watch lecture 10 - Pain in the latter half of the 20th century
 - A re-evaluation of pain's position in a global society
 - Pragmatic and multidisciplinary approaches
 - The gate control model
 - The physiopathology of pain
- Watch lecture 11 - Current studies and models of pain management
 - American Pain Society – current guidelines
 - Discussion of selected papers from the National Academy of Sciences colloquium “The Neurobiology of Pain”, 20088
 - Pain and the dying: the hospice movement and the work of Cicely Saunders
 - 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
3. Forum posting: Questions associated with the article – “Bach, Beethoven, and the Neural Matrix” - – small group discussion/response on day 11; day 12 whole group discussion/response.

4. Assignment 5 – Read essay from "The Case for Morphine" – answer questions.
5. Case study due – day 12
6. Self-test

Module 5 – Your perception of pain – Days 13-15

1. Peer review of one other case study – due day 13
2. Small group case study discussions – day 13
3. Whole group case study discussions – day 14
4. Retake pain survey - due day 13 – forum discussions – how views have changed – small groups day 14 – whole group day 15
5. Critique of non-textbook reading – due day 13
6. Small group discussion of non-textbook reading – day 14
7. Final exam – day 15

Sample lesson for distance education version of the course – one sample lecture and one sample assignment.

History of Pain - Assignment 4

1. Read the article
2. Answer the following three questions– individual answers due by end of day 7
 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. Small group forum discussion - prepare your groups response to take to tomorrows full group discussion – small group response due by end of day 8
4. Full group discussion – each small group presents their response – day 9

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 ANÆSTHETICS by Valentine Mott, M.D.

Among the many improvements which characterize modern surgery, one of the most invaluable is the introduction of Anæsthetics. 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 anæsthetics:-

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 anæsthesia 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. When death occurs in such cases without reaction, it is the direct effect of pain.

Ambrose Paré, the father of modern 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 anæsthetics, 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 anæsthetics. 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 anæsthetics. 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 preceeds 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 anæsthesia 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 anæsthetics, 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 anæsthetic 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 anæsthesia, 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 anæsthesia than as practicable anæsthetic 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: *Anæsthetics, 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 thousands 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 anæsthetics 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 anæsthetics, 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.

Lecture 1 – Introduction to Neurons, Synapses, Action Potentials, and Neurotransmission

This is a basic neurobiology lecture and the interactive curriculum from The Mind Project has a number of excellent flash animations that enable you to visualize neuronal processes. After reviewing this lecture as well as lecture 2 you should have a clear understanding of how we perceive pain. Follow this link for lecture 1:

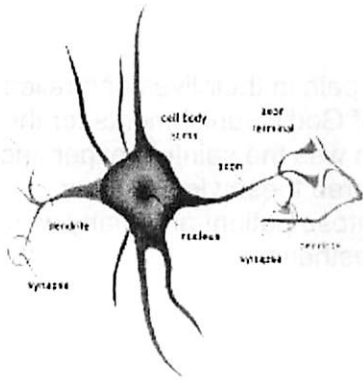
<http://www.mind.ilstu.edu/curriculum/modOverview.php?modGUI=232>

After lecture two you will take the self test on this module (1). You must pass the self test to be able to move on to module 2.

Introduction to Neurons, Synapses, Action Potentials, and Neurotransmission

Author: Robert Stufflebeam

Overview:



MODULE DESCRIPTION:

This module is an introduction to the structure and function of neurons, how they generate action potentials, and how they "communicate" with other neurons (neurotransmission) via synapses. This module includes flash animations illustrating the difference between electric synapses and chemical synapses, conduction, electrical neurotransmission, and "classic" chemical neurotransmission.

MODULE COMPONENTS:

CURRICULUM

- **Neurons, Synapses, Action Potentials, and Neurotransmission**
- An introduction to the structure and function of neurons, as well as how neurons communicate both electrically and chemically.

FLASH ANIMATIONS

A number of people have requested that each animation open in a blank window rather than be embedded within the text. The links below will do just that.

- **The Action Potential**
- An animation illustrating how an action potential is generated.
- **Synapses**
- An animation illustrating the difference between electrical and chemical synapses.
- **Electrical Neurotransmission**
- An animation illustrating intercellular communication (or synaptic transmission) between two neurons via gap junctions.
- **"Classic" Chemical Neurotransmission**

- An animation illustrating intercellular communication (or synaptic transmission) between two neurons at chemical synapses.

ADDITIONAL FLASH RESOURCES

- **Neurotransmission: Summary**
- An animation illustrating the difference between chemical neurotransmission and electrical neurotransmission.
- **Long-Term Potentiation (LTP)**
- Long-Term Potentiation (LTP) is the long-lasting enhancement in communication between two neurons that results from stimulating them simultaneously or in quick succession. This flash animation illustrates how the release of the neurotransmitter glutamate causes LTP in AMPA channels.
- **Neural Synchrony**
- Neural synchrony is the simultaneous / synchronous oscillations of membrane potentials in a network of neurons connected with electrical synapses (gap junctions). It is considered by some theorists to be the neural correlate of consciousness.

Credits:

Funding

This module was supported by *National Science Foundation Grants* #9981217 and #0127561.

Syllabus of Record - The History of Pain

BIOL 118. The History of Pain 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 | <p>Introduction - What is pain</p> <ul style="list-style-type: none"> a. physiological b. pathological c. personal interpretations - where does it hurt? d. do animals (other than humans) and plants feel pain |
| 7 Lecture hours | <p>The Physiology of Sensation</p> <ul style="list-style-type: none"> 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 |

History of Pain

1 Lecture hour	Exam 1
3 Lecture hours	<p>Following pain through the ages - Earliest Recorded Examples of Pain</p> <ul style="list-style-type: none"> 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	<p>Pain in the Middle Ages</p> <ul style="list-style-type: none"> a. Galenism b. The four elements and four humors - scientific views in the middle ages b. Arab influences c. Eastern influences d. Pharmacology
3 Lecture hours	<p>Pain in the Renaissance</p> <ul style="list-style-type: none"> 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 hour	Exam 2
3 Lecture hours	<p>Pain in the Classical Age</p> <ul style="list-style-type: none"> 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	<p>Pain in the Age of Enlightenment</p> <ul style="list-style-type: none"> 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	<p>Pain in the 19th century</p> <ul style="list-style-type: none"> a. Pain physiology - the great debate - central or peripheral nervous system

The History of Pain

- 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 later half of the 20th century

- a. A re-evaluation of pain's position in a global society
- b. Pragmatic and multidisciplinary approaches

4 Lecture hours

- c. The gate control model
- d. The physiopathology of pain

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 Stembach, and Patrick Wall

Final exam (four) 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

The History of Pain

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

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 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.
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- 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.
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- 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

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 4-3-3-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.

The History of Pain

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.