MISMR
Michigan Society for Medical Research

BioFocus

A Newsletter Exploring Science & Biomedical Research Issues For School Educators

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Our Mission

The Michigan Society for Medical Research (MISMR) is a nonprofit educational organization that supports biomedical research and testing and the judicious use of animals in research, education and testing in the interests of human and animal welfare. Established in 1981, MISMR is made up of the state's leading research universities, teaching hospitals, pharmaceutical companies, voluntary health organizations and hundreds of scientists, educators and students who understand and support the importance of animal research and testing in advancing health care and treatment.

MISMR Educational Projects & Activities

ANNUAL ESSAY CONTEST

Every year MISMR sponsors an essay contest open to all Michigan high school students. Students from well over 500 schools in the state have annually participated in the contest to address the benefits of biomedical research. Prizes are awarded.

SPEAKERS BUREAU

MISMR volunteers visit K–12 schools and civic community groups through out Michigan each year to educate the public about biomedical research and to dispel commonly held myths.

ANNUAL SYMPOSIUM

MISMR's popular annual meetings have often proved to be "standing room only," typically attracting local and national educators and researchers with interactive training workshops and presentations promoting biomedical research.

WE WANT TO HEAR FROM YOU!

We want to include your stories, comments or questions relating to animals in your classroom in upcoming editions of *BioFocus.* Please email stories to: mismr@umich.edu

BioFocus

BioFocus is published by the Michigan Society for Medical Research. Please send your questions, comments, and suggestions to:

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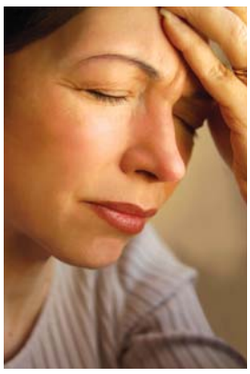
Managing Pain



Have you or anyone that you've known suffered from either acute or chronic pain? How was it treated?

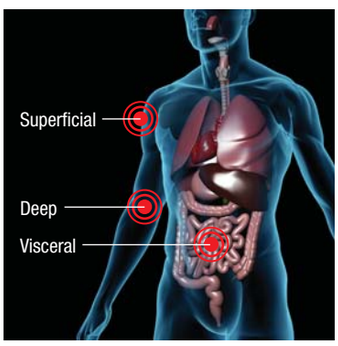
There is an epidemic of pain in the United States. In 2006, the U.S. Centers for Disease Control found that 25% of American adults had suffered a day-long bout of pain in the previous month. 10% said the pain had lasted more than a year. 15% of adults experienced migraine or severe headaches in the preceding 3 months. (Migraine headaches were 3 times more likely to occur among younger adults ages 18–44.) Older adults showed a high incidence (up to 20%) of joint or arthritic pain. (1) And yet, the continued widespread under treatment of pain results not only in individual suffering, but an estimated loss of productive work time worth $61.2 billion a year. (2)

Even beyond the issues of pain management in an aging civilian population, the return of thousands of injured veterans, many of whom suffer chronic, sometimes debilitating pain, adds urgency to the need for more effective treatment regimes.

The word "pain" comes from the Latin "*poena,*" meaning torment, pain or punishment, suggesting that pain is deserved or to be suffered, as in the case of many admired Western historical and religious figures. So while pain is a medical condition, the experience and treatment of it are influenced by the socio-cultural, philosophical, and political environments in which it occurs.

Pain is often accompanied by depression, which the International Society for the Study of Pain includes in their basic definition of pain as **an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.**

Physical (or somatic) pain is classified as "acute" (sudden but short-lived) or "chronic" (lasting more than 6 months). Pain is also described by its location in the body *(see graphic to the right)*: "superficial" is in the skin; "deep" pain is in the joints, muscle or bone and includes arthritic pain; while "visceral" pain occurs in the internal organs. "Referred" pain is pain that is felt in a part of the body away from the actual injury. Cancer pain is often considered a separate category for the purposes of pain management because it may arise from either or both the treatment (radiation and chemotherapy) and the tumor itself.



Pain can be described by its location in the body.

During the course of evolution, acute pain has had a strong adaptive/survival value because it identifies danger (in the case of a burn, for example), it signals that an injury has occurred, and it immobilizes the sufferer, which aids in healing. Chronic pain has no such adaptive value. Prolonged, uninterrupted pain damages the nervous system which then itself becomes the originator of pain.

Although pain and attempts to treat it have always existed, it wasn't until the mid-1800s that anesthesia using ether was developed. Prior to that time, surgery was conducted with the subject conscious and in excruciating pain. Until the early 1990s, surgeons operated on infants without anesthesia because babies are highly sensitive to anesthetic drugs, and because of a widespread belief among doctors — now proven false — that infants do not experience pain as adults do.

Today, anesthesiologists are highly trained medical specialists who work mainly to prevent pain during surgery. Acute and chronic pain management is the domain of physicians skilled in treatments as diverse as pain-relieving drugs, physical therapies, electrical stimulation, and even surgical intervention.

Are the ethical challenges of experimenting on animals and other human beings worthwhile if they lead to effective pain treatments?

Research in pain management has resulted in many useful techniques, but experiments on animals and humans requires absolute adherence to very strict ethical guidelines in which the subject is respected as a living individual. Animal experiments are regulated by federal and state agencies, and constrained by professional and medical ethical guidelines. These include making certain that the subject is exposed to the minimum amount of pain necessary for the purposes of the experiment, and the conscientious monitoring of the state of animal subjects.

Human experimentation is governed by the World Medical Association's Declaration of Helsinki, Recommendations Guiding Doctors in Clinical Research; the Ethic Principles of the American Psychological Association; the Declaration of Lisbon, the Rights of the Patient; and other international documents. Proposed research on human subjects must be reviewed and

Continued on back…

Fast Facts...

Pain Management Research

"If you think research is expensive, try disease."

— Mary Lasker 1901–1994

- Pain and depression often coexist and have overlapping characteristics. Research has shown that medicines developed for depression can also relieve pain.
- Better pain management is available because research is identifying underlying mechanisms of chronic pain.
- Research identifies mechanisms of drug action leading to more cost-effective treatments.
- Scientists are studying natural painkilling processes to create better drugs to relieve pain.
- Basic research funded by the National Institutes of Health is focused on identifying the next generation of pain medications through discoveries in genetics, molecular imaging and cell repair.

SOURCES:

Lynch, Me. Antidepressants as Analgesics: A Review of Randomized Controlled Trials. J. Psychiatry Neurosci 2001, 26(1): 21–29.

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Pain — Hope through Research, National Institute of Neurological Disorders and Stroke, National Institutes of Health (http://accessible.ninds.nih.gov/health_and_medical/pubs/pain.htm).

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Managing Pain... *Continued from front*

approved by an independent committee of scientists, health care practitioners, and lay members. Human participants may not be coerced or harmed; they need to understand that their participation is voluntary and that they may withdraw at any time.

Pain research has resulted in the development of "nerve blocks" that isolate localized pain by interrupting its transmission to the central nervous system. Electrical stimulation, by either implanted or external devices, can reduce some forms of pain to a "tingling" sensation. Low impact joint movements sometimes help reduce arthritic pain. Surgery — cutting the affected nerve endings — is considered the last resort for pain treatment. It sometimes brings immediate relief, but may not be permanent and could even become a new source of pain.

Painkilling drugs are often the most effective means of reducing pain.

Intervention with painkilling drugs is one of the least invasive treatments, and often the most effective means of reducing pain. In minor pain, anti-inflammatories like aspirin and acetaminophen suffice, but in severe cases of acute and chronic pain, opiate-based drugs and their relatives can be the only useful treatment.

It is in the treatment of severe chronic pain that medicine comes up against social and political forces. A combination of societal beliefs and law enforcement policies combined with a lack of knowledge among doctors has produced what is referred to as "opiophobia," or the fear of using some of the most powerful pain relievers available, like morphine. In 2007, testimony before Congress about the treatment of veterans described the under treatment of pain as a "national scourge." 48% percent of veterans receiving pain medication reported that it was ineffective. In fact they had been deliberately given inadequate doses of medication.

In 2004 the American Medical Association took the position that "pain of all types is under treated in our society. Physicians' fears of using opioid therapy…contribute to the barriers to effective pain management." (3)

Health care professionals' fears are not irrational. Physicians who prescribe controlled substances fear that they could be investigated without good cause. Patients are afraid that their records may subject them to prosecution. Pharmacists are also concerned. (4)

Law enforcement's concepts of drug abuse also impinge on evidence that cannabinoids in marijuana are useful in pain management, among other medical uses. It appears that in some cases, marijuana-derived substances in doses that are not psychoactive can be useful in enhancing or sometimes replacing the use of opiates in cases of muscular dystrophy and cancer. In 2008, Michigan became the 13th state to approve a medical marijuana law, which means that over a quarter of the people in the U.S. have access to cannibis under the supervision of a doctor. Ironically, patients can still be prosecuted under Federal drug laws.

Should government drug control efforts take precedence over a doctor's judgment and a patient's pain management needs?

Governmental policies put health care professionals into ethical conflict, and need revision. "The relief of pain is a core ethical duty in medicine. Unrelieved pain blocks enjoyment of all other human goods and values…pain is not merely a cloak that a patient carries, it is instead an attack on the human being's core." (5)

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(1) Centers for Disease Control and Prevention, National Center for Health Statistics. "New report finds pain affects millions of Americans," *Health United States, 2006*. 11-17-06.

(2) DeLuca, MD, MPH, Alexander. "The treatment of chronic pain in veterans." Testimony submitted to the House Subcommittee on Crime, 7-12-07.

(3) American Medical Association, "About the AMA position on pain management using opioid analgesics," 2004, from the web at www.ama-ssn.org/ama/pub/category/11541.html.

(4) General Accounting Office, "Prescription drugs: state monitoring programs provide useful tool to reduce diversion." (Washington, DC: Government Printing Office, May 2002), GAO-PO-634, p. 18.

(5) Johnson, JD, LLM, Sandra H. "Legal and ethical perspectives on pain management," *Anesthesia and Analgesia*, 105: 5–7, 2007.

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