

****REVISED** MH 550/HS 550: Medical Technologies in Historical Perspective **REVISED****
T TR 1:00 PM – 2:00 PM, 1010 Medical Sciences Center (MSC), University of Wisconsin-Madison
Method of Instruction: Seminar/Lecture

Instructor Information:

Course Instructor: Prof. Dayle B. DeLancey, Ph.D.

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Office: MSC 1426 (1300 Univ. Ave.)

Office Hours: TR 2:30 PM – 3:30 PM (MSC 1426), or by appointment.

Course Description:

From stethoscopes to He-La cells, medicine's technological innovations are often among the most novel and controversial aspects of contemporary society. Yet, history reveals that neither the emergence of high-profile medical technologies nor the dilemmas that often accompany their arrival are strictly 'modern-day' phenomena. History also demonstrates that such technologies tend to reflect not only the medical science, but also the social concerns, of the periods in which they have emerged. In this course, we will explore the ways in which a range of technologies – e.g. stethoscopes, spirometers, sphygmomanometers, vaccines, hospital design, x-rays, ultrasound, computerized record-keeping, pharmaceuticals, reproductive technologies, gene therapy, artificial hearts and kidneys, virtual medicine, etc. – have at once shaped medicine and invited critique. Using readings from a range of sources that illuminate key medical technologies in the 18th- to 21st-century U.S., we will analyze these technologies in historical, social, and theoretical context. Questions guiding our work will include: What are the historical roots of significant medical technologies? How did these technologies change medical practice over time – and vice versa? Why have physicians and the public embraced some medical technologies and not others? What non-medical technologies have influenced the development of medical technologies? To what extent have social, political, and economic concerns shaped the development and distribution of medical technologies?

Course Prerequisites: JR., SR., Permission of Instructor

Grading & Assessment: *Each student's final grade will be derived from the following elements:*

- * In-class Discussion: 30%
- Reading and Research Journal Entries: 15%
- Literature Review Essay on Topic of Final Research Paper: 25% (**Due in class, 10/11/12**)
 - 1500 words (about 6 pp) for undergraduates
 - 2500 words (about 10 pp) for graduate students
- Final Research Paper: 30% (**Due 12/14/12, 5 PM in Course Dropbox**)
 - 3750 words (about 15 pp) for undergraduates
 - 6000 words (about 24 pp) for graduate students

* Because we are conducting this course in seminar/lecture format, **thorough preparation of assigned reading and active participation in classroom discussion are required of each student and comprise a large portion of each student's final grade.**

Research Guidance: Mrs. Micaela Sullivan-Fowler at UW's Ebling Library will provide research guidance for final research papers at a special Ebling Library class on 10/11/12.

GRADING SCALE:

Students will be graded on the following scale:

A: 93-100; A/B: 88-92; B: 83-87; B/C: 78-82; C: 70-77; D: 64-69; F: <64.

Required Readings: All course readings are contained in the course's ELECTRONIC READER, via Learn@UW.

Core Texts in Electronic Reader: Books of which we will be reading large portions include (in reverse chronological order):

- Stanley Joel Reiser, *Technological Medicine: The Changing World of Doctors and Patients* (Cambridge: Cambridge University Press, 2009).
- Keith Wailoo and Stephen Pemberton, *The Troubled Dream of Genetic Medicine* (Baltimore: Johns Hopkins University Press, 2006).
- Margarete Sandelowski, *Devices and Desires: Gender, Technology, and American Nursing* (Chapel Hill: University of North Carolina Press, 2001).
- Keith Wailoo, *Drawing Blood: Technology and Disease Identity in Twentieth-Century* (1997; Baltimore: Johns Hopkins University Press, 1999).
- Bettyann Holzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New York: Basic Books, 1997).
- Joel D. Howell, *Technology and the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: Johns Hopkins University Press, 1996).
- Stanley Joel Reiser, *Medicine and the Reign of Technology* (1978; Cambridge: Cambridge University Press, 1981).

Disability Policy:

In compliance with the Americans with Disabilities Act, I urge any student with a disability to inform me as soon as possible, so that I may make any necessary accommodations to ensure full participation and facilitate educational accessibility. All such requests are confidential.

Students are expected to familiarize themselves with UW policies on plagiarism and to assume full responsibility for academic integrity in all coursework.

Course Objectives:

Upon completion of this course, students should know, understand, and be able to use concrete examples to explain the following in appropriate historical and social context:

- The development, emergence, legacies, and antecedents of some landmark medical technologies.
- Medical technology's role within and/or impact upon:
 - the practice of medicine;
 - conduct of medical research;
 - production and revision of medical knowledge – including disease concepts;
 - medical professionals, professions, and institutions.
- Medical technology's impact upon the experience of the patient.
- Medical technology's relationships with industry.
- Medical technology's relationships with commercial markets.
- Significant theoretical and/or historiographic approaches to the study of medical technologies.
- Key controversies in the development and/or use of medical technologies.
- Medical technologies and bioethics, including questions of allocation, justice, and risk.
- Interactions between medical technologies and ethnicity, race, gender, class, and religion.
- The means of assessing the efficacy and value of medical technologies.

WEEK 1: COURSE INTRODUCTION, THEORY, & BACKGROUND

TUESDAY, SEPTEMBER 4, 2012:

**COURSE INTRODUCTION: PERSONAL INTRODUCTIONS, HOUSEKEEPING ISSUES,
SYLLABUS REVIEW, OVERVIEW OF MAJOR THEMES**

In-class readings:

J. M. S. Pearce, "A Brief History of the Clinical Thermometer," *QJM: An International Journal of Medicine* 95.4(2002): 251-252.

THURSDAY, SEPTEMBER 6, 2012:

THEORY AND BACKGROUND

Stephen J. Kline, "What Is Technology?" in Robert C. Scharff and Val Dusek, eds., *Philosophy of Technology—The Technological Condition: An Anthology* (Malden, MA: Blackwell, 2003), 210-212.

Robert L. Heilbroner, "Do Machines Make History?" in Scharff and Dusek, eds., *Philosophy of Technology*, 398-404.

ALSO: Re-read the Pearce readings distributed in class on September 4, 2012. (You will also find it uploaded into Learn@UW.)

Week 2: THE STETHOSCOPE: The Disappearance of the 'Sick-Man'? Part One

TUESDAY, SEPTEMBER 11, 2012:

Malcolm Nicolson, "The Art of Diagnosis: Medicine and the Five Senses," in W. F. Bynum and Roy Porter, eds., *Companion Encyclopedia of the History of Medicine, Volume 2* (London and New York: Routledge, 1993), 801-825.

Stanley Joel Reiser, *Medicine and the Reign of Technology* (1978; Cambridge: Cambridge University Press, 1981), "Chapter 1: Examination of the Patient in the Seventeenth and Eighteenth Centuries," 1-22.

THURSDAY, SEPTEMBER 13, 2012:

Reiser, "Chapter 2: The Stethoscope and the Detection of Pathology by Sound," *Medicine and the Reign of Technology*, 23-44.

* Nicholas D. Jewson, "The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870," *Sociology*, 10.2(1976): 225-244.

* **Because the stethoscope and the microscope are the two central technologies in Jewson's argument, we will be reading this article in the stethoscope unit, then reviewing it for further discussion in the microscope unit!**

Week 3: THE MICROSCOPE: The Disappearance of the ‘Sick-Man’? Part Two

TUESDAY, SEPTEMBER 18, 2012:

Reiser, “Chapter 4: The Microscope and the Revelation of a Cellular Universe,” *Medicine and the Reign of Technology*, 69-90.

C. Heitzman, “The Aid which Medical Diagnosis Receives from Recent Discoveries in Microscopy,” *Archives of Medicine (New York)*, 1(1879): 44-67.

THURSDAY, SEPTEMBER 20, 2012:

Deborah Jean Warner, “The Campaign for Medical Microscopy,” *Bulletin of the History of Medicine*, 69(1995): 367-386.

*Nicholas D. Jewson, “The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870,” *Sociology*, 10.2(1976): 225-244.

*** Because the stethoscope and the microscope are the two central technologies in Jewson’s argument, we read this article in the stethoscope unit, and are now reviewing it for further discussion in the microscope unit!**

Week 4: THE SPIROMETER & THE SPHYGMOMANOMETER: Measuring Physiology

TUESDAY, SEPTEMBER 25, 2012:

Reiser, “Chapter 5: The Translation of Physiological Actions into the Languages of Machines,” *Medicine and the Reign of Technology*, 91-121.

Alexander Rattray, “The Spirometer in Diagnosis,” *Pacific Medical and Surgical Journal*, 22(1879-1880), 110-117.

THURSDAY, SEPTEMBER 27, 2012:

Lundy Braun, “Spirometry, Measurement, and Race in the Nineteenth Century,” *Journal of the History of Medicine and Allied Sciences*, 60.2(2005): 135-169.

Hughes Evans, “Losing Touch: The Controversy over the Introduction of Blood Pressure Instruments into Medicine,” *Technology and Culture*, Special Issue: Biomedical and Behavioral Technology, Vol. 34.4(1993): 784-807.

Week 5: X-RAYS AND VISUAL TECHNOLOGIES:

The Anatomized or Transparent Patient

TUESDAY, OCTOBER 2, 2012:

Reiser, “Chapter 3: Visual Technology and the Atomization of the Living,” *Medicine and the Reign of Technology*, 45-68.

Bettyann Holzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New York: Basic Books, 1997), as follows:

- “Chapter 1, The Discovery of X-Rays: Seeing Is Believing,” 9-32.
- “Chapter 2, Medical Applications: The Living Body beneath the Skin,” 33-53.

THURSDAY, OCTOBER 4, 2012:

Kevles, *Naked to the Bone*, as follows:

- “Chapter 3, Technological Innovation 1897-1918: Building a Better Mousetrap,” 54-76.
- “Chapter 4, Medical Politics between the Wars: Setting Standards,” 77-96.
- “Chapter 5, Technological Innovation 1910-1918: Sharper, Clearer, Deeper,” 97-115.

!!ALERT!!: LITERATURE REVIEW ESSAY DUE IN CLASS ON 10/11/12!!

Week 6-A: DIAGNOSTIC LABORATORY TECHNOLOGY: Case Studies in Blood

TUESDAY, OCTOBER 9, 2012:

- Reiser, "Chapter 6: Chemical Signposts of Disease and the Birth of a Diagnostic Laboratory," *Medicine and the Reign of Technology*, 122-143.
- Keith Wailoo, "Chapter 2: The Rise and Fall of Splenic Anemia: Surgical Identity and Ownership of a Blood Disease," in *Drawing Blood: Technology and Disease Identity in Twentieth-Century* (1997; Baltimore: Johns Hopkins University Press, 1999), 46-72.
- Ross C. Whitman, "The Technique of Blood Examination," *The Chicago Medical Recorder* 26(1904): 24-37. Reprinted in: Howell, ed., *Technology and American Medical Practice* (New York and London: Garland, 1988, 33-40.

!!ALERT!!: LITERATURE REVIEW ESSAY DUE IN CLASS ON 10/11/12!!

Week 6-B: EBLING LIBRARY RESEARCH CONSULTATION

THURSDAY, OCTOBER 11, 2012:

EBLING LIBRARY RESEARCH SESSION WITH MRS. MICAELA SULLIVAN-FOWLER.

The class will meet with Mrs. Micaela Sullivan-Fowler, Ebling Library's Head of Special Collections, for a special session featuring databases, special archives and collections, and other resources that will assist students with research for their final papers.

Week 7: HOSPITAL TECHNOLOGY:

Technology in Hospitals, Hospitals as Technology, Part One:

TUESDAY, OCTOBER 16, 2012:

- Reiser, "Chapter 7: Medical Specialism and the Centralization of Medical Care," *Medicine and the Reign of Technology*, 144-157.
- Joel D. Howell, "Chapter 1: Physicians, Patients, and Medical Technology" in *Technology and the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: Johns Hopkins University Press, 1996), 1-29.

THURSDAY, OCTOBER 18, 2012:

Howell, *Technology and the Hospital*, as follows:

- "Chapter 2: Science, Scientific Systems, and Surgery: Technology and the U.S. Hospital," 30-67.
- "Chapter 8: Machines and Medicine: Lessons from the Early Twentieth Century," 227-249.

Week 8: WAR & MEDICAL TECHNOLOGY: Prosthetics, Medical Photography, and Penicillin

TUESDAY, OCTOBER 23, 2012:

- Beth Linker, "The Limb Lab and the Engineering of Manly Bodies," *War's Waste: Rehabilitation in World War I America* (Chicago: University of Chicago Press, 2011), 98-118.
- Beth Linker, "Shooting Disabled Soldiers: Medicine and Photography in World War I," *Journal of the History of Medicine and Allied Sciences* 66.1(2010): 313-346.

THURSDAY, OCTOBER 25, 2012:

- John Patrick Swann, "The Search for Synthetic Penicillin during World War II," *The British Journal for the History of Science* 16.2(1983): 154-190.
- Charles M. Grossman, "The First Use of Penicillin in the United States," *Annals of Internal Medicine* 149(2008): 135-136.

Week 9: PHARMACEUTICALS: Technological Products of Science, Medicine, and Industry
TUESDAY, OCTOBER 30, 2012:

- Charles E. Rosenberg, "The Therapeutic Revolution: Medicine, Meaning, and Social Change in America," in Judith Walzer Leavitt and Ronald L. Numbers, eds., *Sickness and Health in America: Readings in the History of Medicine and Public Health*, Second Edition (Madison, WI: University of Wisconsin Press, 1985), 39-52.
- Nancy Tomes, "The Great American Medicine Show Revisited," *Bulletin of the History of Medicine*, 79.2(2005): 627-663.

THURSDAY, NOVEMBER 1, 2012:

- Dominique Tobbell, "Allied Against Reform: Pharmaceutical Industry–Academic Physician Relations in the United States, 1945–1970," *Bulletin of the History of Medicine* 82.4 (2008): 878-912.
- Jeremy A. Greene, "Releasing the Flood Waters: Diuril and the Reshaping of Hypertension," *Bulletin of the History of Medicine*, 79.4(2005): 749-795.

Week 10: GENETIC TECHNOLOGIES: Ethnicity, Race, Commerce, and 'Science's Holy Grail'

TUESDAY, NOVEMBER 6, 2012:

- Daniel J. Kevles, "Out of Eugenics: The Historical Politics of the Human Genome," in Daniel J. Kevles and Leroy Hood, eds. *The Code of Codes: Scientific and Social Issues in the Human Genome Project* (Cambridge, MA: Harvard University Press, 1992), 3-36.
- Sally Smith Hughes, "Making Dollars Out of DNA: The First Major Patent in Biotechnology and the Commercialization of Molecular Biology, 1974-1980," *Isis* 92.3(2001): 541-575.

THURSDAY, NOVEMBER 8, 2012:

- Keith Wailoo and Stephen Pemberton, "Chapter 1: Eradicating a 'Jewish Gene': Promises and Pitfalls in the Fight against Tay-Sachs Disease," *The Troubled Dream of Genetic Medicine* (Baltimore: Johns Hopkins University Press, 2006), 14-60.
- Jennifer K. Wagner, "Interpreting the Implications of DNA Ancestry Tests," *Perspectives in Biology and Medicine* 53.2 (2010): 231-248.

**Week 11-A: GENDER & TECHNOLOGY:
Feminist Theories of Technology Meet Nursing History**

TUESDAY, NOVEMBER 13, 2012:

- Margarete Sandelowski, *Devices and Desires: Gender, Technology, and American Nursing* (Chapel Hill: University of North Carolina Press, 2001), as follows:
- "Chapter 3: The Utensils and Materials at Hand," pp. 44-66.
- "Chapter 4: The Physician's Eyes," pp. 67-99.
- "Chapter 5: Truly and Technically Nursing," pp. 100-134.

Week 11-B.: COMPUTER TECHNOLOGY: Beyond Quantification and Automation

THURSDAY, NOVEMBER 15, 2012:

- Reiser, "Chapter 10: Telecommunication, Automation, and Medical Practice," *Medicine and the Reign of Technology*, 196-226.
- Chul-Young Roh, "Telemedicine: What It Is, Where It Came From, and Where It Will Go," *Comparative Technology Transfer and Society*, 6.1 (2008): 35-55.

**Week 12-A.: QUESTIONING MEDICAL TECHNOLOGY, PART I:
VACCINES—Coercion, Risk, Personal Freedom, & the Public Good**

TUESDAY, NOVEMBER 20, 2012:

- Alexandra Minna Stern and Howard Markel, "The History of Vaccines and Immunization: Familiar Patterns, New Challenges," *Health Affairs*, 24.3(2005): 611-621.
- James Colgrove, "Between Persuasion and Compulsion: Smallpox Control in Brooklyn and New York, 1894-1902," *Bulletin of the History of Medicine* 78.2(2004): 349-378. Rpt. in James Colgrove, *State of Immunity: The Politics of Vaccination in Twentieth-Century America* (Berkeley and Los Angeles: Milbank and the University of California Press, 2006), 17-44.
- Lawrence O. Gostin and Barbara D. DeAngelis, "Mandatory HPV Vaccination: Public Health vs. Private Wealth" (Editorial), *Journal of the American Medical Association* 297.17(2007): 1921-1923.

THURSDAY, NOVEMBER 22, 2012:

NO CLASS

THANKSGIVING RECESS

NO CLASS

Week 13: QUESTIONING MEDICAL TECHNOLOGY, PART II: Evaluation and Efficacy

TUESDAY, NOVEMBER 27, 2012:

Reiser, *Medicine and the Reign of Technology*, as follows:

- "Chapter 8: The Shortcomings of Technology in Medical Decision-Making," 158-173.
- "Chapter 9: Selection and Evaluation of Evidence in Medicine," 174-195.

THURSDAY, NOVEMBER 29, 2012:

- David J. Rothman, "The Iron Lung and Democratic Medicine," *Beginnings Count: The Technological Imperative in American Health Care* (New York: Oxford, 1997), 42-66.
- James H. Maxwell, "The Iron Lung: Halfway Technology or Necessary Step?" *The Milbank Quarterly* 64 (1986): 3-29.

Week 14: QUESTIONING MEDICAL TECHNOLOGY, PART III: Risk, Rationing, and Justice

TUESDAY, DECEMBER 4, 2012:

- George J. Annas and Sherman Elias, "Thalidomide and the *Titanic*: Reconstructing the Technology Tragedies of the Twentieth Century," *American Journal of Public Health*, 89.1 (1999): 98-101.
- Reiser, "Chapter 3: Lifesaving but Unaffordable: The Improbable Journey of the Artificial Kidney," *Technological Medicine*, 31-51.
- Reiser, "Chapter 4: Promising Rescue, Preventing Release: The Double Edge of the Artificial Respirator," *Technological Medicine*, 52-73.

THURSDAY, DECEMBER 6, 2012:

- Landecker, Hannah, "Immortality, In Vitro: A History of the HeLa Cell Line," in Paul E. Brodwin, ed. *Biotechnology and Culture: Bodies, Anxieties, Ethics* (Bloomington: Indiana University Press, 2000), 53-72.
- Rebecca Skloot, *The Immortal Life of Henrietta Lacks* (New York: Crown, 2009), selections.

****ALERT: FINAL RESEARCH PAPER IS DUE BY 5 PM ON DECEMBER 14!!!****

Week 15: REVIEW AND ASSESSMENT

****ALERT: FINAL RESEARCH PAPER IS DUE BY 5 PM ON DECEMBER 14!!!****

TUESDAY, DECEMBER 11, 2012:

Reiser, "Chapter 7: Amid the Technological Triumphs of Disease Prevention, Where Is Health?" *Technological Medicine*, 129-157.

Reiser, "Chapter 9: Governing the Empire of Machines," *Technological Medicine*, 186-204.

Jennifer Obel, "Losing the Touch: As Technology and Medical Education Change, Doctors May Lose the Ability to Perform Physical Exams," *The Washington Post*, June 17, 2003, F01.

THURSDAY, DECEMBER 13, 2012:

Harry M. Marks, "Medical Technologies: Social Contexts and Consequences," in Bynum and Porter, eds., *Companion Encyclopedia of the History of Medicine*, Vol. 2, 1592-1618.

Reiser, "The Science of Diagnosis: Diagnostic Technology," Bynum and Porter, eds., *Companion Encyclopedia of the History of Medicine*, Vol. 2, 801-825.

DECEMBER 14, 2012: FINAL RESEARCH PAPERS DUE

PLEASE SUBMIT YOUR FINAL RESEARCH PAPER TO COURSE DROPBOX

AS A PDF E-MAIL ATTACHMENT

BY 5:00 PM ON DECEMBER 14, 2012.