The Impact of Medical Technologies: Extending the Five Senses

When René Laennec promoted the technique of auscultation and developed the first stethoscope (from the Greek, “seeing the chest”) in 1816, it opened a new dimension to the techniques of medical diagnosis, where learning to listen properly became a new skill. It took nearly 100 years before diagnostic skills were again altered with new ways of seeing, aided by X-Ray, ultrasound, computed tomography, magnetic resonance, and laser-optic imaging among other technologies. This course examines the development of human tacit skills, the ethnography of medical practice, and the public perception of hi-tech medicine that have been shaped throughout the history of emerging medical technologies.

This course does not proceed chronologically throughout the ages to introduce and explain devices that might constitute a medical technology. Rather, we begin by questioning what constitutes “technology”, and we explore different ways—historical and contemporary—that such technologies have impacted the medical profession and affected the intellectual and physical practices involved with the production of medical knowledge. The topics and readings presented in the course schedule below will frame our analysis and relate our discussions to the historiography of science that has already begun to tackle fundamental issues involved with this subject. What is not listed, but will be accommodated throughout the course, is reference to further “case studies” where a wide variety of particular medical technologies will be discussed. The selection of case studies will be generated through class discussion and student preference.

COURSE OBJECTIVES

- Identify the main themes in the development of medical technologies and practices.
- Understand how new medical technologies—for diagnostic procedures as well as patient management—have changed dominant medical thinking and changed the nature of human skills in assessing states of health and disease.
- Synthesize the development and impact of medical technologies into larger currents in intellectual, political, social and culture history.
- Critically use primary scientific and secondary scholarship in Science and Technology Studies to frame questions about the social impact of medical technologies.
- Examine case studies regarding the ethics of using medical technologies in the delivery of health care.
- Appreciate and interpret the complexity and diversity of past situations, events and mentalities.
• Evaluate problems inherent in the historical record and apply critical skills to the interpretation of complex, ambiguous, and incomplete materials.

• Gather, sift, select, organize, and synthesize large quantities of evidence (as the availability and multiplicity of sources increases dramatically in the 20th century).

• Formulate appropriate questions and provide reasoned answers or arguments using valid and relevant evidence.

General Readings

Overviews


On Medical Imaging
Wolbarst, Anthony Brinton and Gordon Cook. *Looking within: How X-ray, CT, MRI, ultrasound, and other medical images are created, and how they help physicians save lives* (Berkeley: University of California Press, 1999)


Course Requirements

Throughout the course, you will be required to demonstrate your engagement with the literature and the topics explored through two forms of in-class presentation:

1) You will need to be able to present a critical perspective on the readings. What are the main points of each reading? What is the author’s main argument? What kind sources and evidence does the author use to support the argument?

2) Following each meeting—once we have discussed the main issues relating to the impact of technology on the practice of medicine and the production of scientific knowledge—you will be
asked to conduct research to find examples from medical literature illustrating the points discussed. You will present your findings the following week in a brief (5 minute) presentation. We will discuss how such research can be conducted and what the parameters of your investigations will be during the first meeting.

Course Schedule:

1. What is a Technology? (178)

a) The sociology and anthropology of technology


Meeting one continued …
b) The body as technology


Case Study:

Hearing:


Optional Readings:


2. Extending the Senses (208)

a) Shifting Focus from the Bedside to Bench


Nicholas Jewson, “The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870”, *Sociology* 10 (1976), 225-44. (19) COURSE PACK


John Harley Warner, “Fall and rise of professional mystery: epistemology, authority and the emergence of laboratory medicine in nineteenth-century America” in Andrew Cunningham and Perry Williams, eds., *The Laboratory Revolution in Medicine* (Cambridge: Cambridge University Press), 110-141. (31) COURSE PACK


b) Science, Technology & Medicine: A Collaborative Enterprise


Case study:

Optional Readings:

3. Technological Representation and Intervention (234)

Ian Hacking, “Introduction”, “Microscopes”, from his Representing and Intervening: Introductory Topics in the Philosophy of Natural Science (Cambridge: Cambridge University Press, 1983), 1-17; 186-209. (41) COURSE PACK


Case study: The Emergence of the “Difference Image”


Optional readings:


Anthony Brinton Wolbarst and Gordon Cook, Looking within: How X-ray, CT, MRI, ultrasound, and other medical images are created, and how they help physicians save lives (Berkeley: University of California Press, 1999).

Lisa Cartwright, Screening the Body: Tracing Medicine’s Visual Culture (Minneapolis: Minnesota University Press, 1995).

4. Mediating Machines: The Influence of Technology on Medical Decision Making (172)

a) Learning to Act

W.C. Rappleye, “Medical Education”, Journal of Higher Education 1 (1930), 154-159. (5)


“Keeping up with Technology and the Changing Role of Medicine”, Contemporary Issues in Medical Education 2 (1999). (2)


b) The Skill of Machines:

Diana Forsythe, “New bottles, old wine: Hidden cultural assumptions in a computerized explanation system for migraine sufferers”, *Medical Anthropology Quarterly* 10 (1996), 551-574. (23)


5. Technology and Health Policy: The Hospital-University-Corporate Matrix

a) *Hospitals and Technology* (149)


Louise Russell, *Technology in hospitals: Medical advances in their diffusion* (New York: Brookings Institution, 1979), 1-40 (40) COURSE PACK

b) *Technological incentives*


Optional:


6. Technology and the Patient

Patient’s Point of View:


Law:


Techno-patients:

Information Overload:

7. Technology and Medical Surveillance

a) Technology and the Gaze

Andrew Warwick, “X-Rays as Evidence in German Orthopaedic Surgery, 1895-1900”, Isis 96 (2005), 1-24. COURSE PACK


b) Technology and Subjection

Stanley Joel Reiser, “The Emergence of the Concept of Screening for Disease”, Health and Society 56 (1978), 403-23. COURSE PACK


Patricia Kaufert, “Screening the Body: The Pap Smear and the Mammogram”, in Margaret Lock, Alan Young, and Alberto Cambrosio, eds., Living and Working with the New Medical Technologies (Cambridge: Cambridge University Press, 2000), 165-183. COURSE PACK


Case study: The Mammography Debate


Optional:

8. Making Medicine Mobile

a) Technology Transfer and Post-Colonial Technoscience


COURSE PACK


b) Telemedicine: Hands Free Medicine


Case studies:
Guided Intervention
Rural Health Care Delivery

Optional readings:


Steven Viegas and Kim Dunn, *Telemedicine: Practicing in the Information Age* (Lippincott Williams & Wilkins, 1998)


**9. Technological Transformations: “Heterotypical Technology”**

**GUEST SPEAKER: DR. LARRY CROOKS**

*a) One Technology, Many Functions*

Michel Foucault, “Of Other Spaces” (1986) [1]


Bettyann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New Brunswick: Rutgers University Press, 1999), chapter 8. COURSE PACK

*Case study:*
MRI for Brain, Breast and Sport Medicine

*b) Evolving Technologies*


Aldo Luisada, "The Reminiscences of a Scientist", *Practical Cardiology* Vol. 11 No.9 (August 1985) (His archive is at Ohio State)

**10. Implications**

GENERAL BIBLIOGRAPHY


Howell, Joel. 1995. *Technology in the Hospital: Transforming Patient Care in the early Twentieth Century* (Baltimore: Johns Hopkins University Press) (gender and technological gaze—ch 5; hospital and scientific management—chapter 2; clinical traditions, ch. 3)


*On MRI specifically*


James, Thomas L., A. Margulis, eds. 1984. *Biomedical magnetic resonance.* San Francisco: Radiology Research and Education Foundation.


