

History of Human Subject Research

US275 Scientific Ethics
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Physicians conducted human dissections at various times in history

- Cadavers
 - gladiators, criminals
- dissections often restricted by religious views of the relationship between the soul and the body.



Gladiators from the Zliten mosaic
c. AD 200

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Human Dissections were banned during the Roman era.

- Galen
 - (Greek anatomist second century AD)
 - dissected animals such as pigs and primates
 - assumed anatomy similar to humans



Depiction of Galen demonstrating that the recurrent laryngeal nerves render an animal voiceless when cut.
3 Junta edition of Galen's Works, 1541

During the Renaissance human dissections began again.

- Andreas Vesalius (1543)
 - father of modern anatomy
 - *de Humani Corporis Fabrica*
 - series of woodcuts of dissected corpses

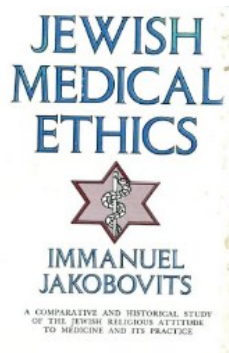


The Anatomy Lecture by Dr. Nicolaes Tulp
Rembrandt, 1632

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Various religious and cultural views have different levels of acceptance of dissection of the human body.

- Judaism
 - values the wholeness and sanctity of the human body
 - “anatomical dissection as a threat to the sanctity of the human body”
 - “leads to defilement of those participating in the dissection.”



Notzer et al., 2006 Overcoming the tension between scientific and religious views in teaching anatomical dissection: the Israeli experience. Clin Anat. 19(5):442-447.

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Human cadavers were, and still are, a major resource for teaching medical anatomy

- Anatomy Act of 1832 (U.K.)
 - prior - only legal source of cadavers were executed prisoners.
 - Body snatching/Grave Robbing was a source for many medical schools
- Currently
 - source for medical school cadavers is voluntary donation of body to science.



The anatomist overtaken by the watch [in] carrying off Miss W-'s is a hamper.
William Austin, 1773

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However, there is a very limited supply for cadavers for research and teaching

- Chinese Medical Schools face shortage of cadavers
 - traditional views of the body
 - lack of legislation regulating donations
 - deficiency of effective channels for cadaver donations.

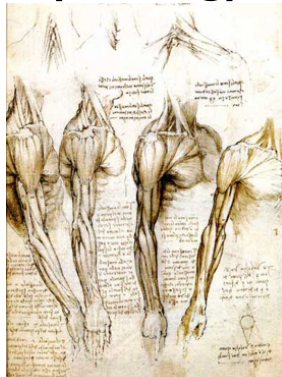


Anatomy class at the University of Oregon Medical School. ca. 1904

Zhang et al., 2008. An ethical solution to the challenges in teaching anatomy with dissection in the Chinese culture. *Anat Sci. Educat.* 1(2):56-59 7

Differences in the study of Anatomy and Physiology

- Anatomy
 - structure
 - can study cadavers
- Physiology
 - function
 - require living organisms
 - or cells
 - or tissues



The muscles of the right arm from the front Leonardo da Vinci, 1515

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Physicians in the 19th century applied an experimental approach to studying physiology

- William Beaumont
 - U.S. Army surgeon
 - Father of Gastric Physiology
- Alexis St. Martin
 - shot in stomach with shotgun
 - survived but had a hole in his abdomen into his stomach



Illustration depicting Dr. William Beaumont experimenting with digestive juice by tapping a fistula into the stomach of Alexis St. Martin. 19th century

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At times, research has been conducted with questionable ethical justifications.

- Edward Jenner
 - observed that milkmaids did not get small pox
 - theorized that exposure to cowpox protected the milkmaids
- to test this theory
 - injected pus from cowpox blister into a child
 - later exposed the child to small pox



The Cow-Pock or the Wonderful Effects of the New Inoculation!
In this cartoon inspired by the vaccine controversy, Edward Jenner administers cowpox vaccine to frightened young women, and cows emerging from different parts of people's bodies. The inoculation agent, cowpox vaccine, was rumored to have the ability to sprout cow-like appendages.
10 Publication of the Anti-Vaccine Society, 1802.

Nazi Experimental on Human Subjects was revealed during the Doctors' Trial

- range of experiments on prisoners in concentration camps
 - head injury
 - freezing experiments
 - mustard gas
 - explosion effects
 - much more



A victim of a Nazi medical experiment is immersed in icy water at the Dachau concentration camp. SS doctor Sigmund Rascher oversees the experiment. Germany, 1942.
United States Holocaust Memorial Museum

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Unit 731 was cited in Tokyo War Crimes Tribunal but never went to trial.

- range of experiments on Chinese prisoners, but included POWs
 - infected with diseases
 - weapons testing
 - germ warfare



Japanese guards stand over Chinese prisoners that were later killed in hypothermia experiments by Unit 731 (1941)

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Tuskegee Study of Untreated Syphilis in the Negro Male

- United States (1932 - 1972)
- Did not receive proper medical treatment
 - to observe long-term effects of disease
- 1972 - Associate Press story about study
 - Ad hoc Advisory Panel ruled study was "ethically unjustified"
 - problems with the study design limited validity of results,
 - most information had already been shown in other studies

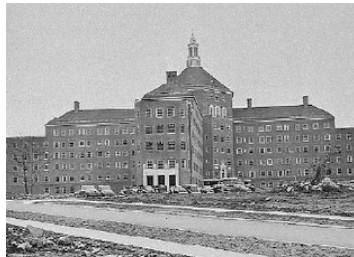


Doctor injects test subject with placebo as part of the Tuskegee Syphilis Study.
Tuskegee Syphilis Study Administration Records, 1929 - 1972

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Willowbrook State School for the Retarded, United States 1955 - 1966

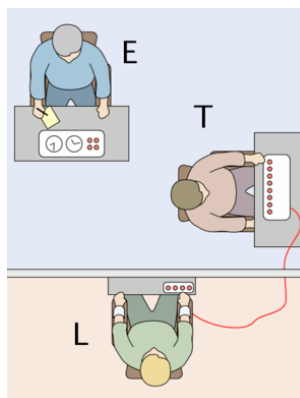
- state supported school for children with intellectual disabilities
 - children intentionally infected with hepatitis
 - tested treatments of gamma globulin
 - led to development of successful hepatitis vaccine



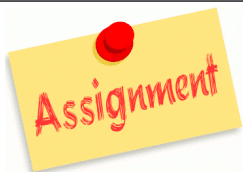
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Milgram Experiment on obedience to authority

- Stanley Milgram, Yale University psychologist
- Subject took role of "teacher"
 - delivered increasingly higher shock intensities to "learner" to punish mistake.
- conclusion
 - ordinary people are likely to follow orders giving by an authority figure



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Assignment

Bad Blood

Watch *The Deadly Deception: The Tuskegee Study* (1-hour video recording). NOVA/WGBH-TV Films for the Humanities and Sciences; 1993.

<http://youtu.be/rLc9T6mr6bE>

In your discussion group:

Identify the ethical philosophies (utilitarianism, virtue theory, egoism, etc) that different individuals used throughout this story. Were the ethical philosophies applied correctly, and if not, what was incorrect? Assuming that everyone involved in this study was acting with good intentions, what can be done when an individual following the principles of one ethical system is in conflict with the ethical principles of other people.

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Readings

Watch Documentary

The Deadly Deception: The Tuskegee Study (1-hour video recording). NOVA/WGBH-TV Films for the Humanities and Sciences; 1993.

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Performance in the Bolshoi Theatre

Mihály Zichy, 1856

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Any Questions?

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<http://www.viporbullkennels.com/images/animated-question-mark.gif>

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