

Timeline of Landmark Events in the Evolution of Bioethics

BC-early 1900s: Development of the foundation of medicine, the idea of doing good and avoiding harm in patients, focusing on the humanistic side of treating patients, what constitutes the “ideal” physician, coining and defining bioethics.

[Hippocratic Corpus](#) (5th century BC): a collection of texts, research, lectures, notes, and philosophical essays on various subjects in medicine, which would become the foundation on which all future medical systems were built. The most famous work in the corpus is the [Hippocratic Oath](#), a landmark declaration of medical ethics.

[Galen](#) (born AD 129): In his treatise, “[The best physician is also a philosopher](#)” he discussed the conflicts between theory and medical practice, identified Hippocrates as a paradigm of medical ethics, stressed that knowledge of the human body must be profound as well as the importance of logic and precise use of language.

- Proposed physicians should have perfect self-control, scorn money and the pleasures of the flesh, and should live a laborious life.

[Thomas Sydenham](#) (1600s): Known as “The English Hippocrates”, and is responsible for the English version of the phrase “The physician must...have two special objects in view with regard to disease, namely, to do good or to do no harm”. He was also the first to describe Scarlet Fever, the link between fleas and typhus, the use of quinine to treat malaria, Sydenham’s chorea, and wrote a treatise on gout.

[Sir William Ostler](#) (1800s): “The father of modern medicine”, he is seen as a model of excellence for the medical profession and treating patients as human beings first. Chief of Medicine at Hopkins, he advocated for a nondiscriminatory policy to admit women to medical school, after learning they were capable of becoming physicians as evidenced by European experience. His book “[The Principles and Practice of Medicine](#)” gained international attention wherein he emphasized the value of hard work and ongoing education. An advocate for blending the art and science of medicine.

[American Medical Association](#) develops its first Code of Ethics (1874).

[Fritz Jahr](#) (1920s): Recognized as the author of the term and concept of “bioethics” (initially credited to Van Renssaler Potter) when his article “Bio-Ethics: A Review of the Ethical Relationships of Humans to Animals and Plants” was found. and proposed a “Bioethical Imperative”, extending Kant’s moral imperative to all forms of life. He outlines the concept of bioethics as an academic discipline, principle, and virtue. He was ahead of his time, with the argument that new science and technology requires new ethical and philosophical reflection.

1940-1960s: Hippocratic Tradition – medical ethics in the hands of physicians, who focused on the welfare of patients and medical professionalism. Unethical experiments on human subjects.

[Nuremberg Code](#) (1947): A set of research ethics principles for human experimentation. These were created in response to the Nuremberg Trials at the end of WWII, and dictate the need in research for: voluntary consent and ability to withdrawal at any time, benefit to society, results justify means, avoidance physical and mental suffering of participants, minimize risks, terminate if results are known, proper preparation to protect subjects.

[Willowbrook Experiments](#) (1956): Developmentally delayed children house in the Willowbrook State School in Staten Island, NY, were intentionally inoculated with hepatitis in order to better understand the natural course of the disease. This study lasted for 14 years. Researchers defended themselves by pointing out the high incidence of hepatitis in the institution prior to the studies, suggesting the children would become infected regardless of the study. This prompted discussion of the [ethics of experiments on children](#).

[Tuskegee Syphilis Study](#), [Terre Haute Prison Experiments](#) → [The Guatemala Experiments](#) (1932-1972): Doctors from the U.S. Public Health Service (many led by [Dr. John Cutler](#)) conducted experiments on human subjects demonstrating egregious violations of human rights in vulnerable patient populations by intentionally infecting them with venereal diseases (syphilis, gonorrhea) and abstaining from penicillin therapy in order to better understand the natural progression of the disease if left untreated. Minorities and vulnerable people were the focus of these experiments, including impoverished African Americans, Guatemalans, mentally incapacitated patients, sex workers, soldiers and incarcerated persons. The Tuskegee Study, the most known and discussed in bioethics history, was ultimately exposed by a USPHS whistle blower who leaked the story to the AP ([Washington Star, then NY Times](#)) in 1972.

[Declaration of Helsinki](#) (1964): Developed by the World Medical Association in order to provide researcher and physicians with ethical guidelines to protect research subjects' health and rights

[Beecher Article: Human Experimentation](#) (1966): A watershed moment in the oversight of scientific research, this article alerted the medical and scientific establishment, as well as the government to U.S. involvement in condemned practices of human research experimentation.

[Harvard Definition of Brain Death](#) (1968): “A Definition of Irreversible Coma” published, which defined those with “no discernable central nervous system activity” as a new criterion for death. Prior to this time, cardiorespiratory failure was the only definition of death.

**1970s: Medical advances: genetics, contraception, safe abortion, organ transplantation, redefining death, hemodialysis.
Shift of public attitudes: U.S. Civil Rights Movement, more educated public, less acceptance of paternalism “doctor knows best”**

[National Research Act](#) (1973): In response to Tuskegee, this law formalized the requirement for IRB process and created the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research to oversee human subject research and authorized the NIH & FDA to develop human research regulations.

[Roe v. Wade Supreme Court Decision](#) (1973) protects a pregnant woman’s liberty to choose to terminate the pregnancy without “excessive” governmental restriction

[Dax Cowart Case](#) (1973): At 25yo, a former US Air Force pilot sustained debilitating full body burn injuries from a propane gas explosion that resulted in the loss of his hands and eyes. Painful life sustaining treatment was carried out against his wishes, which he sustained was a violation of his civil rights. He survived 40+ years beyond the accident, became a personal injury attorney and advocated for patient rights and respect for patient autonomy..

[Karen Ann Quinlan Case](#) (1975): 21yo woman in a persistent vegetative state after overdosing. The hospital refused to remove the ventilator despite parent’s requests, citing that would be euthanasia: the moral and legal equivalent of murder. NJ Supreme Court ruled in favor of the parents. Ventilators and feeding tubes thought to symbolize “an oppressive medical technology, unnaturally prolonging dying”.

[Recombinant DNA Advisory Committee](#) (1975): Formed to develop biosafety standards and guidance for recombinant DNA experiments following Asilomar meeting that identified research on H5N1 and generation of other highly pathogenic viruses with genetic engineering as dual-use research of concern ([DURC](#)) .

[Tarasoff v. Regents of the University of California](#) (1976): A graduate student, Poddar had unrequited love for Tarasoff. He sought psychiatric help for subsequent mental instability associated with this and confided in his psychologist that he planned to kill Tarasoff. The psychologist unsuccessfully recommended he be civilly committed as he was a danger to others. Shortly thereafter Poddar killed Tarasoff. The Supreme Court of California held that mental health professionals have a [duty to warn](#) individuals who are being threatened with bodily harm by a patient.

[President’s Commission of the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research](#) (1974-1978): First of the U.S. Presidential Commissions on bioethics ([full list of bioethics commissions](#)) meant to study social issues like the effects of income and residence on the availability of healthcare, definition of death, patient consent, human subjects research, genetic engineering, counseling and testing.

1970s continued...

[Belmont Report](#) (1979) created by the National Commission for the Protection for Human Subjects of Biomedical and Behavioral Research to summarize ethical principles and guidelines for research involving human subjects, including

- 3 core principles: respect for persons, beneficence and justice
- 3 primary areas of application: informed consent, assent of risks and benefits, and selection of subjects

[Principles Biomedical Ethics](#) (1979): Beauchamp & Childress (Now in 9th edition 10/2019)

- Part of common morality, “The Four Principles”: respect for autonomy, beneficence, non-maleficence, justice
 - i. Autonomy: individuals with capacity are self-determining entitled to make decisions for themselves without undue pressure or coercion.
Basis for informed consent.
 - ii Beneficence: Obligation to act for the benefit of others, act in the best interest of patients
 - iii Non-maleficence: Do not intentionally create harm or injury, fundamental commitment to protect patients from harm
 - iv. Justice: Duty to ensure costs and benefits are fairly distributed. A form of fairness. Per Aristotle: “Giving to each that which is due”
Distributive justice: there isn’t always enough to go around, allocate scarce resources equitably

1980-1990s: Establishment of the concept of Clinical Medical Ethics and hospital ethics committees, bioethics as a field of scholarship. The first genetically engineered mouse. The Human Genome Project is launched, a mammal is cloned. Increasing activism in “right to die” movement. Rise in discussions around physician-assisted suicide, palliative care, rise of managed care.

[Ethical issues of HIV/AIDS epidemic](#) (1980s): many ethical issues arose including those related to patient privacy, duty to treat all patients, duty of patients to disclose HIV/AIDS status, duties to warn at-risk parties, vaccine research, and many others.

[On Being A Scientist](#) (1989): A book produced by the National Academy of Sciences meant for educating scientists in training on responsible conduct in research

[Nancy Cruzan Case](#) (1990)(Cruzan v. Director): landmark “[right to die](#)” case 25yo woman in a car accident that resulted in a persistent vegetative state x 7 years. Parents asked physicians to remove the feeding tube, citing that she had told friends she would not want to live in such a state, and were initially denied by the MO Supreme Court, however, ultimately the U.S. Supreme Court determined that families are able to make such decisions for persons whose wishes in the absence of “clear and convincing evidence” that the patient would have wanted otherwise if they are unable to speak for themselves. This led to a nationwide surge in [advance directives](#).

[The Common Rule](#) (1991): U.S. Federal agencies revise human research regulations for ethical conduct such that all agencies except the EPA accept one basic regulatory framework comply by this rule for protection of human subjects.. Substantive subsequent revisions published in 2018 are the current document “[Revised Common Rule](#)”

[Patient Self-Determination Act](#) (1991): Requires hospitals, nursing facilities, home health agencies, hospice programs and health maintenance organizations to:

1. inform patients of their rights to make decisions concerning their care, to inquire as to whether
2. inquire as to whether a patient has an advance directive and to document their wishes regarding medical care
3. not discriminate against persons how have executed an advance directive
4. ensure that legally valid advance directives and medical care wishes are implemented to the extent permitted by state law
5. provide educational programs for staff, patients and the community on ethical issues concerning patent self-determination and advance directives.

-Ethics consults and review committees were more formally established, leadership

[Researchers successfully clone human embryos](#) (1993)

[Universal Declaration on the Human Genome and Human Rights](#) (1997): document issued by UNESCO best known for its statement against human cloning and abuse of human genome against human dignity.

[Terri Schiavo Case](#) (1998): 26yo woman sustained cardiac arrest at home, was resuscitated but in a persistent vegetative state. Her husband wished to have her removed from artificial feeds, but her parents maintained she would have wanted to sustain life-prolonging measures. After multiple appeals up through the federal court system, her feeding tube was removed and she died shortly thereafter, a total of 15 years after her initial cardiac arrest. This spurred activism in both the “right to die” movement and the “pro-life” movement.

2000-2010s: Graduate training in bioethics available at 50+ institutions, dramatic growth in clinical ethics research and new bioethics journals established. Congress debates legislation on human cloning, journals begin requiring authors to describe their responsibilities for contribution to manuscripts. Bush era bans on embryonic stem cell research are lifted by the Obama administration.

[Office for Human Research Protections](#) (2000): created within the US Dept HHS provides leadership in protection of human subjects involved in research.

[Neuroethics](#) (2002): Formally defined as “the examination of what is right and wrong, good and bad about the treatment of, perfection of, or unwelcome invasion of a worrisome manipulation of the human brain” neuroethics took off in [lay articles](#) as well as [scientific journals](#). International centers of study dedicated to neuroethics.

[Human Genome Project](#) (1990-2003): International scientific research project funded by the National Institutes of Health and numerous international groups that mapped the human genome. This was the first federally funded bioscientific/biotech initiative to explicitly include a performative ethical, legal, and social implications ([ELSI](#)) program to address how the genomic research will affect individuals, family, and society.

[Association of Molecular Pathology et al. v. Myriad Genetics](#) (2013): U/S/ Supreme court ruled that isolated and purified DNA cannot be patented. Only DNA modified by human beings can be patented, thus invalidating Myriad’s patents of the BRCA1 and BRCA2 genes.

[Jahi McMath case](#) (2013): 13yo girl with postop tonsillectomy bleed declared dead by neurologic criteria. Her family sued the hospital, arguing no cardiac death. She was ultimately transferred to another state where parents were permitted to keep her on life sustaining treatment until 2018 when she died and was issued a second death certificate. This [reignited the usefulness of the brain death construct](#) in discussions of policy and bioethics.

[U.S. BRAIN Initiative](#) and [E.U. Human Brain Project](#) (2013) Government funded Neuroethics initiatives that stimulated more study and support for research, also focused on its ethical, legal and social enforcing elevated ethical standards of Neuroethics study.

[Concurrent/Overlapping Surgeries](#) (2015): A whistleblower surgeon at the Massachusetts General Hospital in Boston alerted the Boston Globe to an ongoing policy when surgeons were able being allowed to operate on more than one person a time in multiple operating rooms, some having poor outcomes. “Concurrent surgery” became scrutinized from hospital, patient, physician, and ethical perspectives. A [US Senate inquiry](#) was launched. Subsequently, the American College of Surgeons has issued guidelines surrounding concurrent surgery.

[DoD Instruction: Medical Ethics in the Military Health System](#) (2017): Created to establish policy, assign responsibilities, and prescribe minimum requirements for DoDMEP. Established the MHS Principles of Medical Ethics, the DoD Medical Ethics Program, and the requirements to support the program, provides guidance for military healthcare personnel, and explains the role of the Medical Ethics Integrated Product Team.

2000-2010s continued...

[DoD Medical Ethics Center Charter](#) (2018): DMEC established to operate under the direction of the President, USU to support the development, evaluation, and implementation of a systematic and integrated DoDMEP across the MHS/DoD. Additionally allied with USU's educational curriculum to build/enhance professional military medical leadership in USU students.

[Birth of the first gene-edited babies](#) (2018): He Jiankui of Shenzhen, China claimed to utilize CRISPR-Cas 9 technology to modify CCR5 gene to give the babies immunity to HIV. Ethical genome editing.

[COVID-19 Pandemic](#) (2019): This pandemic has had significant ethical implications with regard to: scarce resource allocation, healthcare disparities, personal liberties, care for incarcerated patients in pandemic, development and experimentation of novel vaccines, and many more areas. At times during the pandemic, clinicians and ethicists have been forced to shift focus from the individual patient to considerations for the overall good.

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