



# Lecture 4: Bioethics

Stem Cells Decal



# Admin

- Grades released tonight
- Reflections due next week
- Quiz in section



# Are we beyond ethics?

Who would violate ethics today? Are the body of literature, and the guidelines for action, not sufficiently clear?

As clinicians: what does it mean to do good?

As researchers: what does it mean to have a positive impact?

As a community: is the integrity of others in biomedicine my problem?

# Tuskegee Syphilis Study

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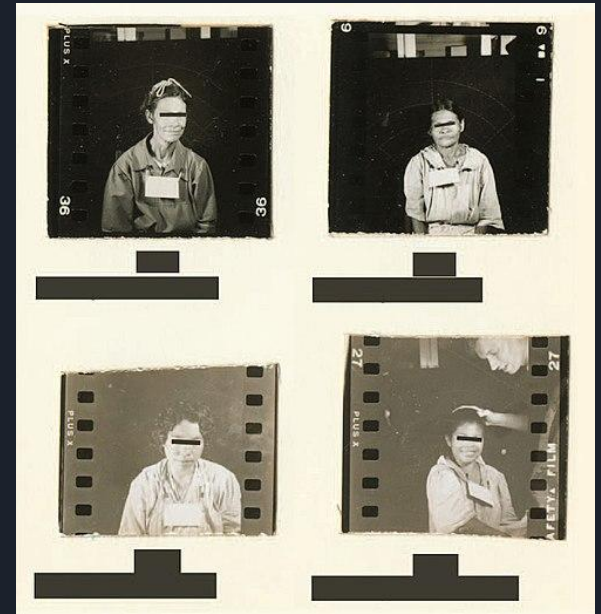


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# Skid Row Cancer Study

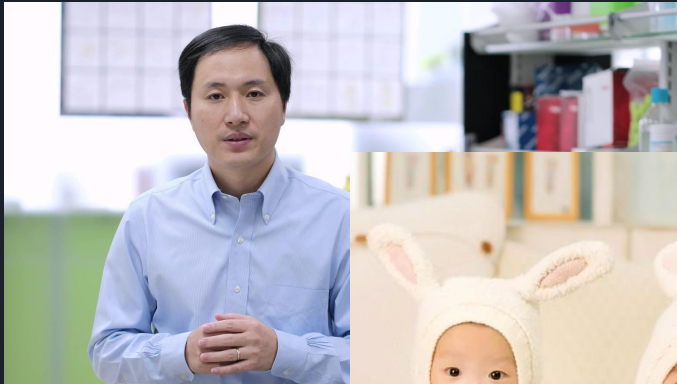
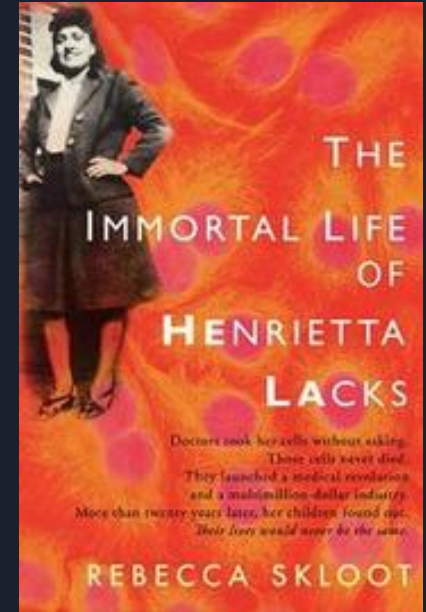
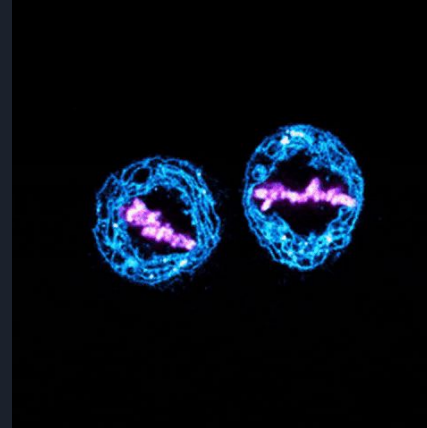
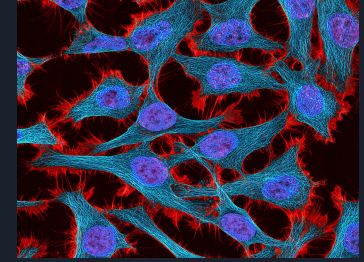
Conducted by urologist Perry Hudson on the homeless men in Lower Manhattan, in the 1950s and 1960s. The men were promised a clean bed, three meals, and free medical care, if they had prostate cancer.

For select patients he conducted biopsies on them, searching for cancer, without informing them of the side effects.



# Previously on the Stem Cell Decal

- HeLa Cells
- Somatic gene line modification
- Embryonic Stem Cell research

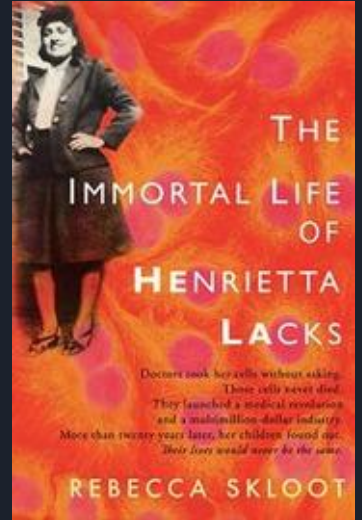
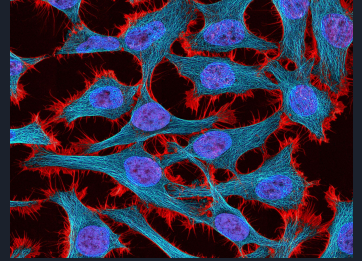


# Henrietta Lacks and the HeLa cell line

Derived from the cervical cancer cells taken in 1951 from Henrietta Lacks, without consent for future research applications.

These were the first “immortal” line of cells, and critical for research, but the benefits this research created were not returned to the Lacks family. The family is currently using lawsuits regarding this.

This also presents unique issues with the availability of the family’s genetic information in research databases.





# He JianKui and the CRISPR babies

In 2018, he announced the creation of the world's first genome edited babies, Lulu and Nana.

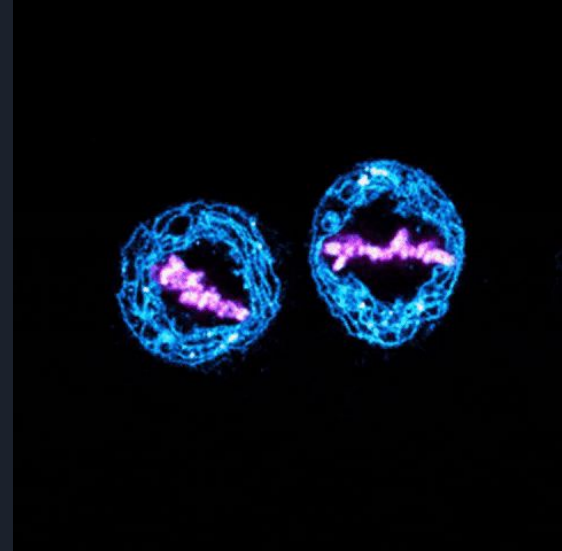
They knocked out CCR5-32, which codes for a protein that HIV-1 uses to enter cells.

The children are currently alive and well, and are exhibiting mosaicism in their cells.



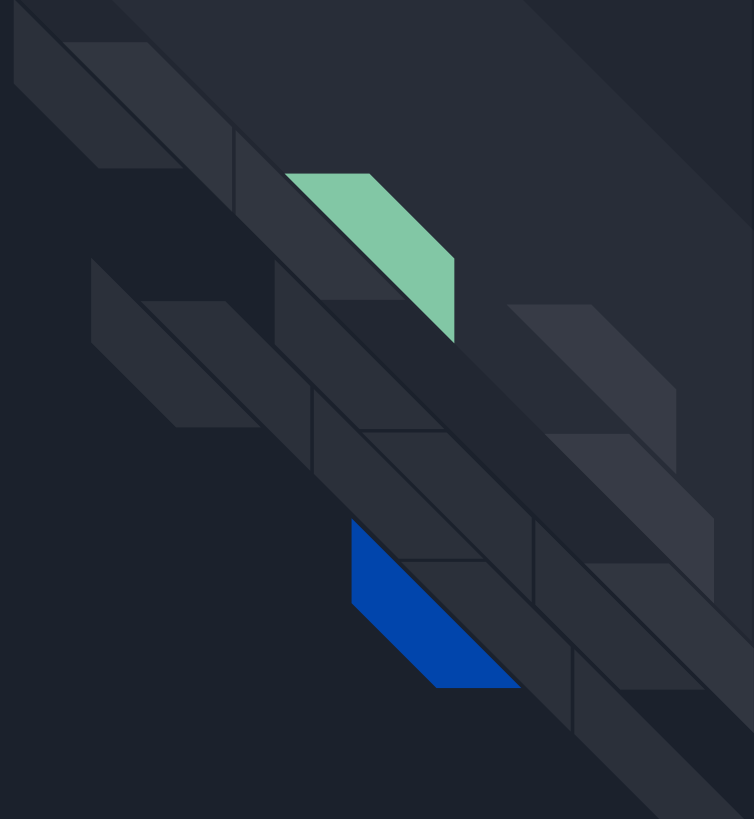
# Embryonic Stem Cell Research: Controversies

- In-vitro fertilization
- Utilization of discarded products
- Ethicality of using gametes for research
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  - The 14-day limit



# The Four Principles of Bioethics

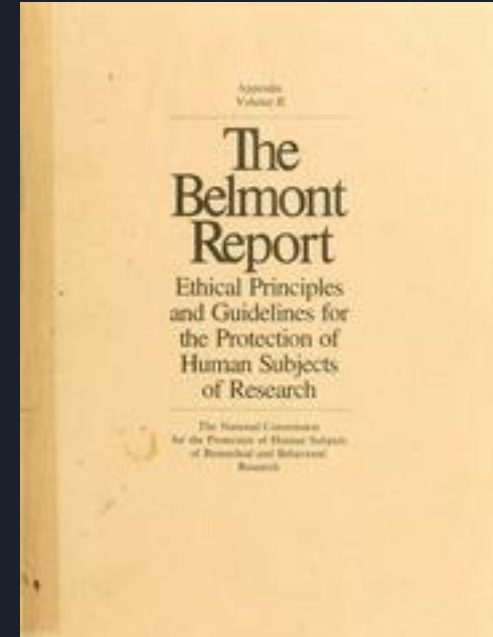
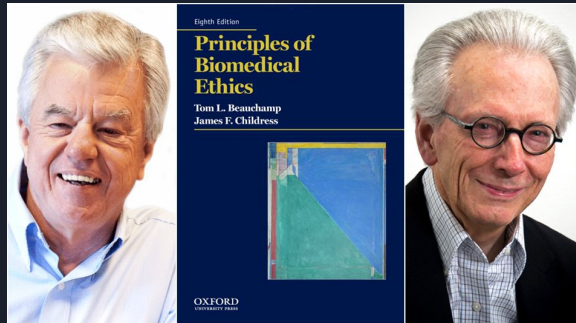
1. Autonomy: Protect Patient Choice
2. Non-maleficence: Prevent Harm
3. Beneficence: Promote Doing Good
4. Justice: Ensure Fairness



# Source: The Belmont Report

Written by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research in 1976.

Made in response to the Tuskegee Syphilis Study

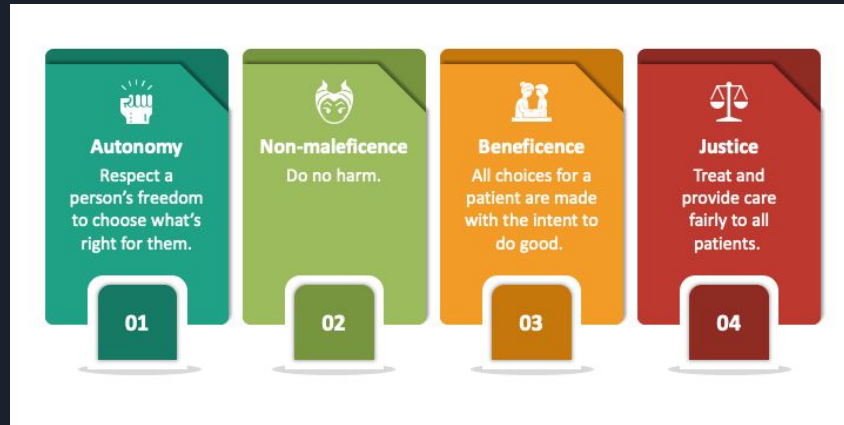




# Autonomy

Recognizes the right of patients to make their own decisions about medical care.

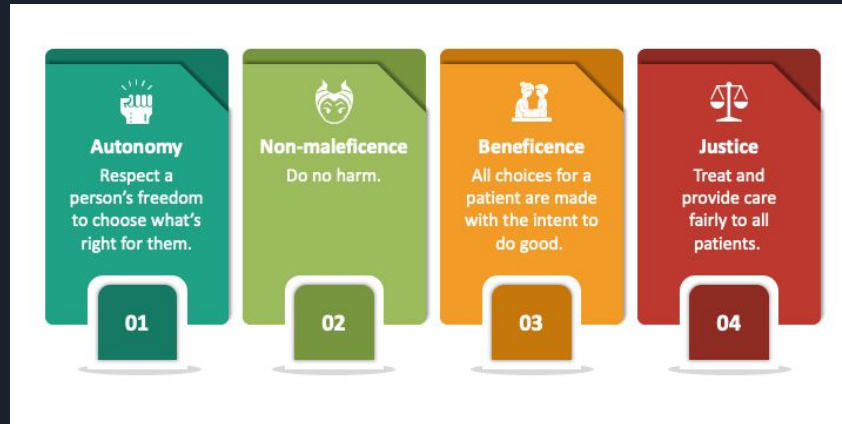
Protects patient self-determination and prevents paternalism in medicine.



# Non-maleficence

Directs healthcare providers to "do no harm" to patients, from the hippocratic oath.

It sets the threshold for treatment, ensuring that interventions do not cause more harm than good.

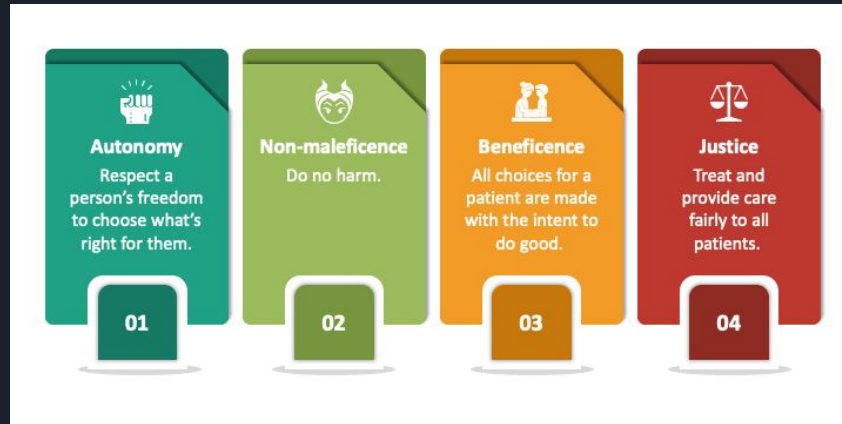




# Beneficence

Requires healthcare providers to act in the best interest of patients and actively do good

Requires us to go beyond simply avoiding harm and promotes positive action to help patients.

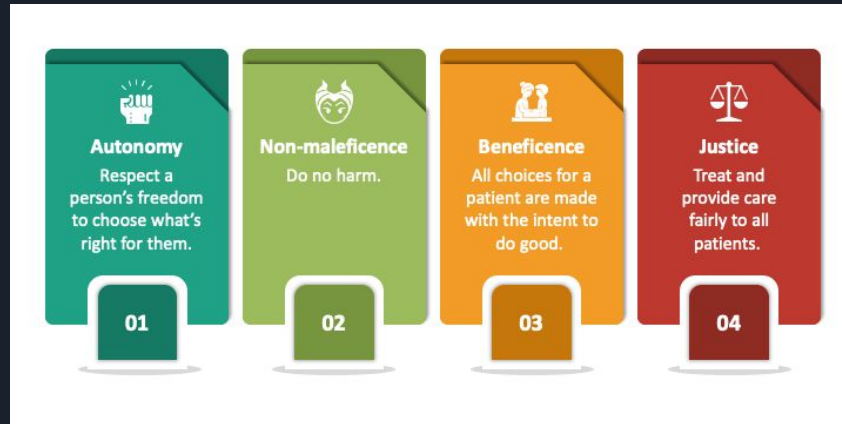




# Justice

Concerned with the fair distribution of benefits and burdens in healthcare.

Addresses issues of equity, access, and resource allocation in healthcare systems.





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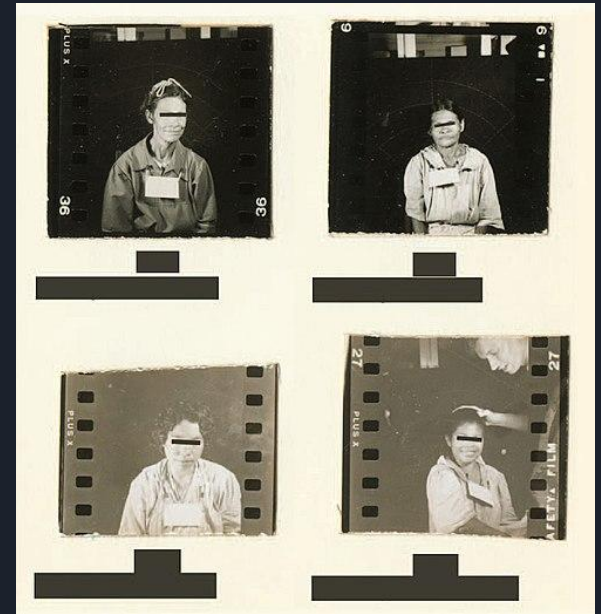


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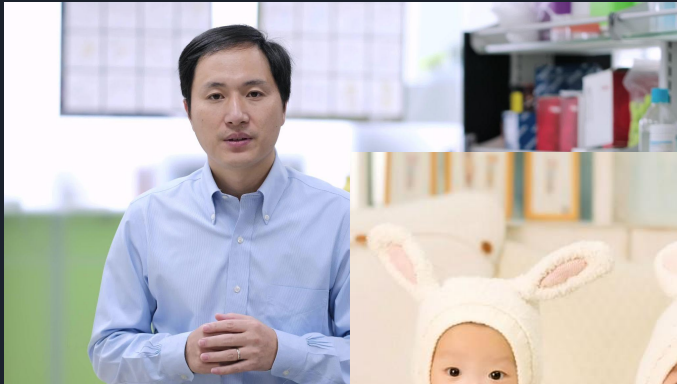
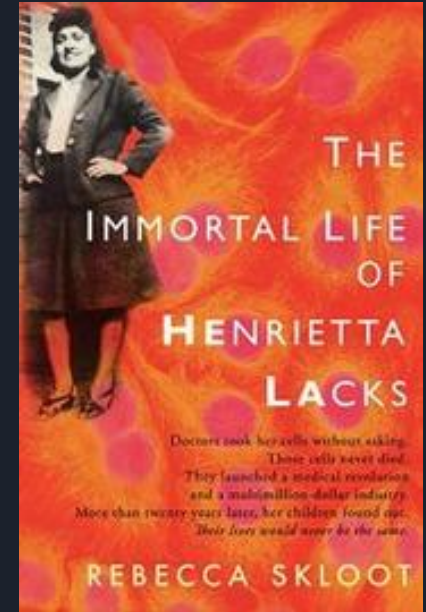
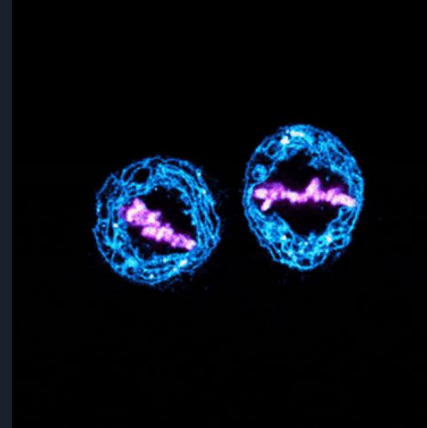
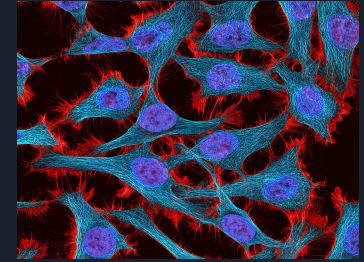
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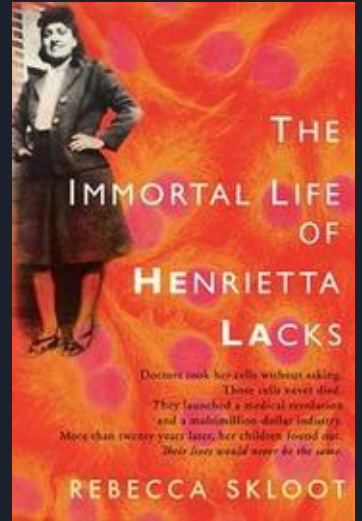
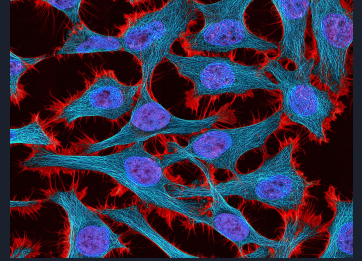


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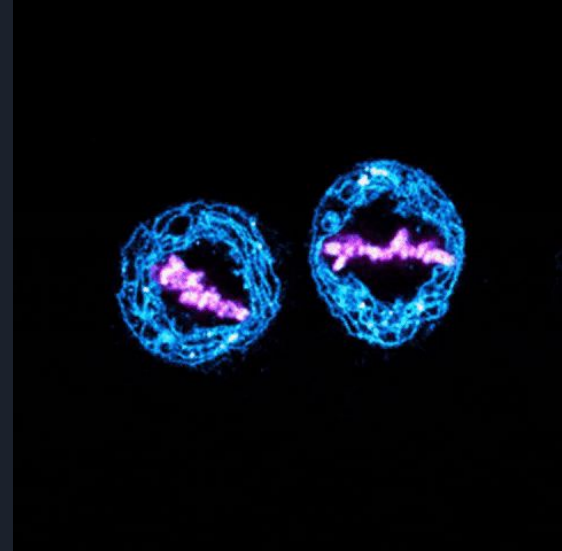
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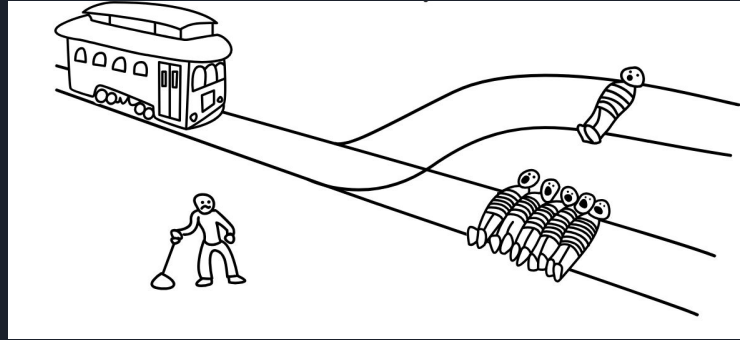


# Ethical Frameworks



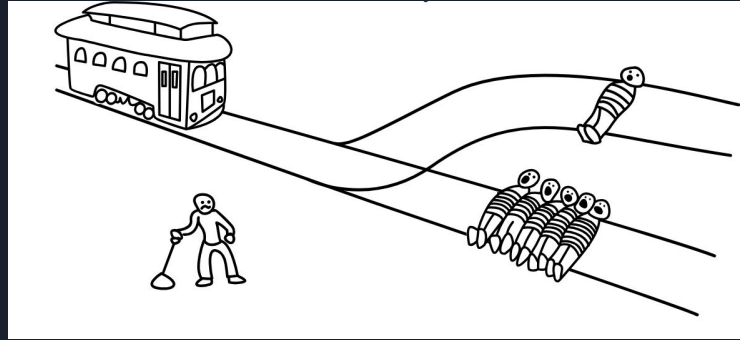


# Consequentialist Ethics



Ethical dilemmas should be resolved based on calculations made about the results of taking particular actions

# Deontological Ethics



Ethical dilemmas should be resolved based on principles guiding how a person ought to intended to action

# George Bush

In 2001, President Bush prohibited the NIH from funding research for the derivation or use of additional embryonic stem cell lines.

His rationale to allow continued research on current lines was that the embryos from which those lines were produced had already been destroyed



# Barack Obama

In 2009, President Obama would reverse this decision.

This did not reverse the Dickey-Wicker amendment, which prohibits federally funded investigators from creating or causing harm to embryos.





# Re-evaluating Controversies

HeLa cells: how do we balance the environment for continued drug discovery without causing significant and egregious violations of justice towards people?

Gene editing: to what extent do we have an obligation to future generations to edit or not edit our somatic genes?

ESCr: between the competing interests of avoiding harming life, and finding better ways to prevent the loss of life, how do we balance research interests?

# Extension to Policy

Policymakers are regulators, and are often not specialists. Further, discussion with specialists may be choosing between degrees of evil: the consults available to them are both biased sources

Regulations must be enacted sooner rather than later. The risk of medical tourism is high. The risk of lack of informed consent is high.

The image shows a screenshot of the Facebook page for Medica Stem Cells. The page header includes the name 'Medica Stem Cells' and the handle '@medicastemcells'. The cover photo features the text 'LEADERS IN PAIN MANAGEMENT PAIN MANAGEMENT USING REGENERATIVE MEDICINE' and 'Get back to doing the things you love faster and without surgery'. A recent post from the page is visible, containing a testimonial from M. Keenan about stem cell treatments for hip pain. The post has 29 reactions, 2 comments, and 2 shares. The page also includes a 'Create a Page' button and a 'Send Message' button.

# Sneak peek of future episodes

Brain organoids: are they alive? Do they have consciousness?

Chimeras: how close are we to being able to create human-animal hybrids? Should this kind of research (animals with human-based cells) be banned?

Gastruloids: what are the ethical considerations around creating early-life forms?

