

BioE 100 Mid Term Exam 2
October 31, 2013

$\frac{184}{195} \rightarrow \sim 94\%$

Name _____ Student ID _____

ETHICAL THEORIES: TRUE OR FALSE (2 POINTS EACH)

1. F. The Belmont Report codifies research ethics on animal experimentation
2. T. Pure Animal Rights comes to a moral conclusion that animal research is never ethical.
3. F. All emerging technologies get better and eventually become zero-risk.
4. T. All animal care facilities must follow the 3Rs but in BioE100 we follow the 5R's.
5. F. Deep ecology supports continued use of fossil fuels and relevant sustainability technologies.
6. T. Anthropocentrism asserts that only humans have moral standing.
7. T. Justice ethics is used to designate acceptable populations for human experimental research.
8. F. Rights ethics primarily supports the "opt-out" position for scarce medical resources such as organs
9. T. The Nuremburg Code first laid down the principles of informed consent

$\frac{9}{10} \rightarrow \frac{18}{20}$

- X 10. T. Burdened groups are typically the first choice for human experimentst that benefit all populations.
ethically or in practice?

ETHICAL CONCEPTS: CIRCLE ALL WHICH ARE TRUE (5 POINTS EACH)

- ✓ 11. Example of emerging energy-related technologies that will eventually became zero-risk
 - (a) geoengineering
 - (c) carbon capture and sequestration
 - (c) solar energy
 - (d) none of the above
- ✓ 12. Therapeutic practice like human-to-human organ transplants has a reasonable chance of
 - (a) being successful
 - (c) having a high risk/benefit ratio
 - (b) being both very costly and not very successful
 - (d) none of the above
- ✓ 13. The Belmont report codified the ethical principles of autonomy, beneficence and justice through
 - (a) informed consent
 - (c) selection of subjects
 - (b) risk/benefits assessment
 - (d) (a) and (b) only
- X 14. An IRB is a group that reviews/monitors research involving human subjects including
 - (a) selection of subjects
 - (c) role of principles
 - (b) incentives
 - (d) risk/benefit analysis
- ✓ 15. Animal welfare supported by Peter Singer is supported by which ethical frameworks.
 - (a) preference utilitarianism
 - (c) human dominion
 - (b) specieism
 - (d) mini-ride principle

$\frac{19}{20} \rightarrow \frac{23}{25}$

ETHICAL MINI-CASES: SHORT ANSWER (25 POINTS EACH)

16. **Animal Experimentation.** In early 2013, Congressman Gerald Connolly of Virginia introduced legislation that would add federal legal protection for research bred rats, mice and birds to the Animal Welfare Act (AWA). The AWA had previously excluded these animal species, which are ~95% of the animals used in laboratory experiments, and therefore there was no federal legal force against those who violated animal welfare standards. Summarize the positions taken by Human Dominion, Animal Welfare, and Animal Rights to decide whether Congress should take up the new AWA legislation.

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/ 25

Human Dominion would take a Darwinist perspective and deem that these animals have no sense of language or morality; thus, these animals have no moral value at all. They would therefore oppose this step. Animal welfare would acknowledge that these animals have moral worth — however they have no rights. Since this bill ~~extension adds~~ ^{extends welfare} ~~protection~~ to these animals, Animal welfare groups would ~~allow~~ support this new legislation. Doing so would acknowledge these animals' (though inferior to that of humans) moral worth. Animal Rights would entail that animals have the right to dignity & the right to not be experimented on. This goes beyond animal welfare (which still allows for animal research). Perhaps they will support this bill only in cases of extenuating circumstances (i.e. need for experimentation is too great). However, ^{worse off, utilitarianism} ~~they~~ Animal rights people would take an abolitionist view to this research and would want to stop experimentation (Kant-like because animals are not being treated as means to an end (Regan)).

17. **Human Experimentation.** Mrs. Franklin, an 81-year-old Alzheimer's patient, has been asked to participate in a clinical trial testing a new drug designed to help improve memory. The principal investigator (PI) obtains a signed informed consent from Mrs. Franklin, however, when he meets with Mrs. Franklin to begin the drug study, she seems to not remember what she had signed up for, but which is to be expected given her disease state. During the course of the clinical trial, preliminary analysis of results show that there were three times as many participants in the experimental group who experienced severe nausea and vomiting compared to the control group. Two of the cases were severe enough to require that the participants be hospitalized and included Mrs. Franklin, and both subsequently recovered. Preliminary analysis of the experiment showed that there may be a moderate benefit with the drug. As a member of the IRB comment, using ethical theories on the appropriateness of continuing the study.

19.5
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This study would not be appropriate to continue (or should be postponed pending more research). Firstly, these patients' rights and autonomy is being impinged because they are not of sound mental state to consent to treatment (Franklin failed to remember signing up). This further complicates informed consent since the full nature of the trial is not disclosed in a persistent manner, and there can easily be a failure to understand).

should
consult
family
-2.5

Secondly, Alzheimer's patients are a burdened population group; therefore, the justice ethics of this trial can also be questioned. In addition to their condition, they are exposed to further risk in the trial (seen in the hospitalization). The individual justice for these patients is also impinged upon because they are being targeted for recruitment. Further, it would need facts on incentive to further characterize the justness of this experiment. Next, considering the risk/benefit analysis, this study should be postponed. Yes, there is societal value (beneficence) given Alzheimer's large, ~~multifaceted~~ multifaceted societal impact. However, the risks here appear to be too great compared to the benefits (increased mental function). Given the need for hospitalization for the severe side effects, non-maleficence factors in. These participants are being exposed to undue harm in this trial (exacerbated by their incompetent mental state). Although they recovered, the experiment yielded too little information to justify the risks of near-death. Therefore, this study should not be continued in humans. Ideally, there should be further testing done (on animals, perhaps) to further characterize drug attributes.

Let me
consult
adequate
for
purposes
-3

ETHICAL CASE STUDIES: (50 POINTS EACH)

18. Scarce Medical Resources. Teenager J sica Santill n had a rare heart condition which eventually leads to death. Doctors in her home country of Mexico were not equipped to treat J sica, and her parents paid \$5,000 to be smuggled into the U.S. illegally in 2001 to seek medical care for her, where her father found construction work and her mother worked as a janitor, near Duke University Hospital. Jessica's plight was publicized in the newspaper, and a wealthy businessman took up her cause, getting her listed with UNOS in early 2002 for a heart transplant, and raising money for her medical care. Soon after J sica's condition began to deteriorate so that a transplant would be needed soon, although it was expected she had a good shot of survival after a transplant given her age. In May a heart/lung block became available, and after two potential recipients were deemed unsuitable, J sica was chosen next. In a tragic error by Duke, the organs from a blood type-A donor were transplanted into J sica, whose type-O blood could only lead to acute organ rejection. Powerful anti-rejection drugs were administered, J sica was placed on life support, but Duke remained quiet about the mistake. 2 weeks later UNOS was notified that she was in critical need of another transplant; J sica's chances for survival were now estimated to be ~50-50, and if she did survive, there would be a ~80% chance she would have serious medical problems in the future. Within 2 weeks a second set of organs was allotted to her, and Duke performed a second transplant. However, the trauma of the first organ rejection and being on life support caused irreparable brain damage, and 2 days after the 2nd transplant "all brain function had ceased". Having acquired the facts, analyze the two alternatives, and summarize action.

SK -> Jessica, family, Duke, UNOS
often needed, donor, other recipient
ST -> distributive justice, utilitarianism,
beneficence, rights (role)

(1) Give J sica a second transplant Jessica should be given a second transplant. She has the right to receive adequate medical care. This further follows utilitarianism because, although her family is poor, a wealthy businessman has taken up her cause and can help ensure her cooperation for survival. Therefore, she has the means to cope with the second transplant. This also fosters the role ethics of the doctors who can work to treat Jessica despite the previous tragic error. Distributive justice is also followed here because Jessica was added to UNOS again for a second transplant. She did not game the system which would have disadvantaged others, and she is fairly receiving another set of organs. This promotes beneficence because the organs being donated are not to a lost cause. Given Jessica's age, she can recover. However, the odds can call into question whether the best effect for the largest number of people is achieved; despite this, we must still focus on Jessica's right to live, her family's rights to her, and the businessman's rights to further her cause for recovery. This further promotes the doctors and Duke hospital's role ethics, and justice is still satisfied because she will ~~not~~ fairly receive the second block of organs.

(due to urgency criteria) -0.5

(2) Do not give J sica second transplant Jessica should not receive the transplant primarily for utilitarian reasons. Her odds for survival ~~two~~ are not good and, even with survival, she would require extensive care. This ~~was~~ alternative upholds ~~utilitarianism~~ because this will allow for fewer resource loss in future, especially if the wealthy businessman withdraws support (he has the right to). Furthermore, allowing ~~the~~ this fulfills rights ethics because the donor has the right to have the organs donated for a viable cause (this also is beneficence since greater welfare is ensured to other patients needing transplants, other hospitals and UNOS). Jessica also has the right to a good quality of life which would be impeded with the other alternative. Further rights upheld are the rights of other needed recipients who can be considered (also justly). Jessica's family would be disadvantaged here because Jessica will die. However, this alternative works better because more people benefit now and in future because resources that are scarce are not being consumed for another problematic cause. Thus utilitarianism is upheld in this alternative. Doctors ~~are~~ also Duke are disadvantaged here because of their roles to act as healers. However, they must also be subordinated because this tragic mistake was preventable, and other doctors, hospitals and patients can benefit from this alternative.

Distributive justice here works because Jessica can direct resources from others and this prevents that

Summarize Action Alternative 2 is best. By denying the transplant, more people can benefit from either being allocated the new organs or not losing resources from the second transplant. This fosters utilitarianism and favors everyone but Jessica's family, her doctors, and ~~her~~ (although death may be better than a problematic life).

SK -> Jessica, family, Duke, UNOS
often needed, donor, other recipient
ST -> distributive justice, utilitarianism,
beneficence, rights (role)

19. Environmental Ethics. In 2013, the U.S. leads the world in commercially viable hydraulic fracturing (fracking) to produce ~40% of its natural gas from shale formations, and that will increase by ~45% over the next several decades. This process blasts huge amounts of water mixed with sand and chemicals underground to break apart rock and allow the natural gas to flow from the shale into the collection well. Proponents say that because the US possesses large reserves of shale gas, American energy independence is a real possibility, that fracking technologies will improve to deal with safety, it has created much needed jobs in economically stressed areas, and that a recent U.S. decline in heat-trapping CO₂ was due to more use of natural gas which emits about half as much CO₂ as coal per unit of electricity. Opponents caution that the dangers of the fracking process (have not been fully evaluated,) it contributes to increases in GHGs, it can use a lot of water in parched areas, trigger small earthquakes and contaminate groundwater; they also worry that the low cost of natural gas reduces demand for carbon-free renewable energy sources such as solar and wind, and that natural gas still increases GHG emissions. Given the stakeholders below, assess the two alternatives, and summarize your best course of action. LIST Stakeholders → IN NARRATIVE

St → survive, public, 5017, 100000
Et → rights, non-maleficence, anthropocentrism

49/50

(1) Allow for fracking to continue: The public has the right to energy & power to sustain the current quality of life. Furthermore, the public has the right to jobs, which are being increased with fracking. This alternative also follows anthropocentrism because we must be able to do with the environment what we need to support ourselves. Non-maleficence is also followed here because, while fracking is relatively new, the technology will improve so that more safety is possible. This also supports shallow ecology because it helps reduce the amount of CO₂ in the atmosphere, which will benefit the environment. However, it also furthers our rights and abilities to ~~work~~ develop the biosphere. This can also be supported by justice ethics. The US has significantly contributed to global warming in the past, so, out of fairness, we must work on technologies to reduce CO₂ output so developing nations are not unfairly burdened with this task. The government and public can also benefit (beneficence) from more energy independence, since it will not be necessary to rely on other countries for power, especially if relationships are tense. With all these benefits for

(2) Do NOT support fracking for a large number of stakeholders, utilitarianism is also achieved. Fracking should not be supported. Considering a risk/benefit analysis, disallowing fracking would best allow for non-maleficence. We do not know much about our environment (even in Biosphere 2) and the environment can be significantly harmed.

This damage can then negatively impact humans in the areas from consequential negative effects (earthquakes, land damage). Further, this technology is risky. Following alternative non-carbon energy is better because it will still allow for jobs and will better foster people's rights to safety. The environment also benefits from lower green house gases (GHG), so this follows deep ecology because of our changes to sustain the biosphere in its own right. Furthermore, biocentric individualism is upheld because animals can still be better protected better here than in alternative 1. We still follow justice here by not unfairly burdening developed developing nations to adapt to our contribution to climate change, and we do so even better. We still achieve energy independence, and we still sustain our energy rights. Therefore this alternative is superior for rights — to energy, jobs, and safety — beneficence through independence and less environmental damage. (Another note about jobs is that with more sustainable technologies, their jobs can be more permanent because natural gas will be exhausted). Overall, utilitarianism is best supported here because more people benefit and do so even better.

Deep Ecology stance - 0.5

Summarize action (2) is the best alternative. It allows for benefits better than in alternative 1 and can create a far more positive impact for more stakeholders. Risk/benefit analysis also favors alternative 2, making it superior.

Not clear how to follow you are implying switch to renewables, but not very clear.