BioE 100 Mid Term Exam
March 16, 2010

Name_____ **Student ID**_____

ETHICAL CONCEPTS: TRUE OR FALSE (40 POINTS) -4

1. T. Information technologies ethics is concerned with privacy, ownership, and access.
2. F. The Belmont Report codifies research ethics on animal experimentation.
3. F. The primae facie duty of corporate leaders is that their shareholders make a profit.
4. F. Jeremy Bentham asked "The question is whether they (animals) can understand".
5. F. Telling a lie is ethical in some situations according to Kant.
6. T. Company credo is a formal statement meant to guide corporate professionals on ethical conduct.
7. F. All emerging biotechnologies eventually become zero-risk.
8. T. An IRB is a group that reviews/monitors research involving human subjects.
9. T. Research misconduct does not include honest error or differences of interpretation of valid data.
10. T. Conflict of interest is dilemma between private interests and official responsibilities.
11. T. Slippery slope theory argues that a reasonable act might lead to a bad ethical consequence.
12. T. The first article of the Nuremburg Code laid down the principles of informed consent.
13. T. Non-malfeasance is to not cause reckless or careless harm.
14. F. Ad Hominem is permissible during debate because it supports the moral argument.
15. F. Rawlings statement: "ethics is not a matter of consequence but of duty".
16. T. Autonomy is often used synonymously with rights ethics.
17. F. Descartes believed that humans have only "res extensa" or extended "physical stuff".
18. F. Peter Singer's ethical position on animal research is a complete ban on its practice.
19. T. The USDA supports the use of the 5R's in animal research conduct.
20. T. In human research, justice ethics concerns the fair selection of human research subjects.

ETHICAL FRAMEWORKS: MULTIPLE CHOICE (50 POINTS) -5

21. Listing an author on a publication, who is not involved in the research, because of their status

(a) honorary authorship (b) ghost authorship
(c) deserved authorship (d) none of the above ok, could have been prestige authorship

22. Finding of research misconduct

(a) departure from accepted practices of research (b) misconduct is committed intentionally
(c) proven on preponderance of evidence (d) all of the above

23. Which of the following are types of intellectual property protection

(a) Patents (b) Trademarks
(c) Copyright (d) all of the above

24. Acceptable tactics in debate argument include

(a) ad hominem statements (b) making an evaluative premise
(c) begging the question (d) None of the above

25. Moral calculus based on "desire", "preferences", "intention", "understanding."

(a) rights ethics (b) hedonistic utilitarianism
(a) preference utilitarianism (d) none of the above

26. Where it is impossible to avoid harming human and non-human individuals,

(a) use mini-ride principle (b) use worse-off principle
(c) all of the above (d) none of the above

27. Moral calculus based on balance of happiness and physical pain

(a) preference utilitarianism (b) hedonistic utilitarianism
(c) rights ethics (d) none of the above

28. Assessment of whether animals are capable of feeling pain include

(a) an evolutionary function for pain (b) having moral reasoning
(c) whether a "marginal" case (d) none of the above

29. Ethical theories surrounding animal research

(a) utilitarianism (b) human dominion
(c) animal rights (d) all of the above

30. Rules ethics advocates for a society of moral and legal rules, backed by

(a) force of opinion and law (b) informed consent
(c) Virtue ethics (d) none of the above

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USE OF ETHICAL FRAMEWORKS: SHORT ANSWER (75 POINTS)

31. In the Belmont report, three basic ethical principles were used to codify human research practice through (1) Informed consent, (2) Assessment of Risk and Benefits, and (3) Selection of Subjects. For each define the ethical framework and how it applies to each human research practice component

① Rights, People have the right to understand the sort of danger they might be putting themselves in, and it gives them the opportunity to not go through with the study

② Utilitarian: The potential benefits to the majority must outweigh the risk to the test subjects. So you should also decrease risk, adding to benefit as many people as possible (just like Utilitarian ethics says).

③ Justice, you can't just pick subjects from burdened populations (unless research is specifically for that group), you need to be fair & randomly select subjects.

32. In District 9, when Wikus's left forearm is found to have mutated into an alien appendage, he is immediately taken into MultiNational United (MNU) custody where it is discovered that he can operate alien weaponry due to his fast mutating DNA. The MNU scientists decide to use his body for research to discover how the weaponry works- with the possibility of great profit. Using one of the following ethical frameworks or documents: Peter Singer's Specieism, the Belmont Report, or Corporate Ethics, decide if MNU's intended actions are ethically appropriate.

Belmont Report: According to that, you need informed consent. Wikus obviously didn't give it as he was kidnapped & held against his will. So fail on that. [x]

Assessment of Risk/Benefits: The scientists were going to do great harm to Wikus for the return of lots of money. It is not stated what exactly was to happen w/ the profits they got, but it would have probably just gone to benefit the few who were at the top of the MNU. So it's great risk to the individual for benefit to a select few. [x]

Selection: They purposely chose Wikus, with no randomization at all. Thought to be fair, the population w/ alien arms is probably very small. [✓/x]

Overall, they fail 2/3 of the Belmont Report, and the last one can go either way. So, according to the Belmont Report, the MNU's actions are ethically wrong.

33. Name and describe one ethical framework that applied to science journalism of the lecture by Rob Gunnison or interview of Victor Limjoco

-20 Rights, the public has a right to know about some of the cutting edge science going on around the world & a researcher has a right to tell the public about his/her research in a medium. Science journalists allow both the researcher & the public to get these rights fulfilled.

Connect to lecture
Poor analysis

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ETHICAL CASE STUDIES: (150 POINTS)

34. Research Conduct. Robert A. Millikan was the most famous U.S. scientist of his time, winning the Nobel Prize in 1924, for determining the charge on the electron. Millikan's method involved allowing a droplet to fall between two plates, and then an electric field is created which pulls the droplet upwards. The speed of the droplet, or its rise time, is measured and depends on its charge. If electrons had a spectrum of charges, one would expect a corresponding continuous spectrum of rise times. If, on the other hand, all electrons had the same charge, the rise times would be multiples of a single number. Millikan published tables of his measured drops and their rise times. What these tables indicated was that the charges on the droplets were, indeed, multiples of the same number -- thus, the charge of the electron was a single well-defined value. However, later examination of Millikan's own papers and notebooks reveals that he picked and chose among his drops, leaving many observations out- based on his expectation of what the electron charge should be from theoretical calculations. Ultimately, we know that Millikan was right- to the best of our present experimental and theoretical knowledge: electrons have a specific, discrete charge. Using the 4A's, decide on how Mullikan might have chosen a different ethical course of action.

Name Stakeholders and at least 2 Alternatives

-5

Stakeholders:
- Other scientists
- Millikan
- his labmates
- Government / Public

Nobel

① Could have published all observations/data as is.

② Could have done a lot more experiments, refining techniques, collect more data, until have adequate proof of his expectations

Assess the Alternatives against Ethical Theories

① - Millikan: Probably not get a Nobel Prize, may need to do more work (Duty, since he has a duty as a scientist not to [skew] results, and nonmaleficence b/c he isn't skewing data to get ahead of competition)
- Other scientists: Have more of opportunity to discover the charge themselves without getting hurt by bad scientific conduct. (Justice)
- Labmates: Not really effected, we don't know what happened to them after Millikan published, so they will probably just stay the same.
- Government/Public: Pays more money to Millikan's research. [for]

② - Millikan: Allow [him to] publish results, may lose Nobel Prize b/c someone else got there first. (Duty to do good research, Nonmaleficence since he isn't skewing data to get ahead of competition)
- Other scientists have chance to catch up & publish own work (Justice, Rights)
- Labmates: probably will need to do more work, not much else will change.
- Government / Public: Pays more for money to Millikan's research

Describe course of action

② is the best. Millikan's method was his own, and he could have used/refined it more to get the results he knew were there. By substantially proving that the charge of an electron is constant & by refining his techniques, Millikan is fulfilling his duty as a scientist not to skew results, and is practicing nonmaleficence since he is not skewing results to get ahead of competitors. Other scientists have the right to do their own honest research, so this just levels the playing field (Justice). The public/government may not have been too affected. This choice also allows Millikan/[Millikan's] labmates to adapt to situations, since he has all his data. So for example, if he finds out someone

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36. Human Experimentation/Scarce Medical Resources. PolyHeme is a temporary oxygen-carrying blood substitute made from human hemoglobin that is currently in development for emergency treatment of trauma situations where large volumes of blood are lost and there is no time to do blood typing; PolyHeme has no antigens and thus avoids a negative immunological response. Blood substitutes are useful because while donations are increasing by about 2-3% annually in the United States, demand is climbing by ~6-8% due to an aging population that requires more operations that often involve blood transfusions. Furthermore it is safer in third-world countries since blood transfusion is a very large source of new HIV infections, and in battlefield scenarios in which the armed services would benefit from a safe, easy way to manage blood supply in the field. However, recent clinical Phase 3 trials on trauma patients showed significantly higher level of death for PolyHeme transfusions (13.9%) vs. natural blood transfusions (9.6%). Use the 4As, emphasizing ethical principles of non-malfeasance, autonomy, and utilitarianism, to decide whether this area of experimental medical research should move forward for additional clinical trials. You may assume that the information in the problem is complete for the facts, and consider the following three alternatives

The 4A's: Acquire Facts (given), Alternatives (given), Assessment, and Action

(1) Do not allow additional clinical trials

(2) Formulate informed consent document that disclose facts, leave research design in place.

(3) Halt the study for 3 years to have the research team reformulate the research protocol

Assessment: Stakeholders:
- People who need donations
- People who are trying PolyHeme
- Doctors
- Researchers
- Government/Public

IRB

① This would mostly violate autonomy since there is a great benefit if PolyHeme is successfully tested. It would hurt people who need donations, but can't get them. Researchers studying this would also be hurt since they now need a new job (non-malfeasance). Doctors would continue as they have been before PolyHeme. The government/Public would be the same as before too. There would be no positive or negative consequences.

② If researchers did this, people who need the donations can exercise their right to make a decision about their own body (autonomy). It would also help others who are not test subjects since the data collected might help them later (utilitarianism). Researchers can work on the test, and if it works, doctors could use it to easily help them w/surgeries + blood transfusions (benefit to doctors → utilitarianism too) if this happens to be in a less stable area, or on a 3rd world country (according to the facts). The government might have to pay for a new treatment/product, but the public won't need to donate as much blood.

③ Researchers will minimize the risk during the 3 years (non-malfeasance); after these years are over, they might continue the research, which could be beneficial to people who need blood + the doctors that need them (utilitarianism). The Government/Public will likely be unaffected as in part ②.

Action ③ This provides the greatest benefit to the most people. Not only can the researchers take time to figure out + fix the polyHeme problem, but it can still benefit those who need blood. This falls under utilitarianism ethics, and non-malfeasance since the researchers can try to minimize the risk. Later, they can formulate new consent forms + such

and the doctors that need them