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## Counting Sheep: Ethical Protocols in Animal Research

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### Part 1

Mariel Cambria is a graduate student in the first year of her Ph.D. program. Prior to entering graduate school, Mariel worked as a veterinary surgical technician in a local veterinary clinic for four years. She subsequently joined a research group at the Acme Medical School that is actively studying the effects of various diseases of the liver. Mariel's specific project is aimed at understanding the vascular response of the liver during different stages of cancer. Although her ultimate goal is to elucidate the scenario in the human, she uses the sheep as a model in her research.

Mariel's animal model is a breed of sheep that is particularly susceptible to liver cancer when fed high doses of a certain chemical. After cancer is induced in the animals, they undergo a number of surgical procedures designed to facilitate continuous blood sampling from the liver. The technique involves cannulating a blood vessel in the liver and externalizing the tubing from which the blood samples can be drawn. Mariel does not perform the surgeries herself, since she is not a veterinarian, but because of her previous clinical experience she assists with all the procedures. Jorge Beliz, another graduate student working on the same grant as Mariel, does the surgeries. Beliz is a veterinarian who is working toward his Ph.D.; his work is focused on cellular changes in the liver during cancer. For his research, Jorge will take liver biopsies during the surgeries. Mariel's work requires that the sheep remain cannulated for a month; after that, they will be humanely euthanized.

Jorge, Mariel and their adviser, Dr. Carroll, collaborated in writing the animal care and use protocol, and it has been approved by the institutional animal care and use committee. The surgical procedures are set out clearly, and Jorge has confirmed that he is fully capable of doing the procedures.

The first round of surgeries is uneventful. As expected, the animals recover well, and both blood and tissue samples are collected from the sheep without incident. The students' only concern is that the surgical procedures are so time consuming that they find

they can only operate on five animals per day of surgery. At this rate it will take them a long time to process all the animals, because the students have limited surgical time allotted to them. Jorge, who is considering a job offer, wants to graduate soon and is especially concerned that he will not be able to complete his research on time. Mariel notices his anxiety. To reassure him, she congratulates him on a job well done.

During the second round of surgeries, Mariel observes that Jorge is rushing through the surgeries and paying less attention to surgical details such as careful tissue handling and proper suturing during the cannulation procedure. He seems to be deviating from the procedures that were approved in their surgical protocol. She is concerned that these deviations could affect the animals' post-surgical recovery by introducing the potential for post-operative pain or internal bleeding and infection. However, Jorge seems pleased because the animals are being processed through the surgeries more quickly.

After the second round of surgery, several animals show signs of increased agitation and discomfort during the recovery period. Despite veterinary care, three animals become lethargic and die within 24 hours. Mariel is very upset about the circumstances of the animals' deaths. Alarmed by the high rate of animal loss, she requests that the three sheep be autopsied. At necropsy, the livers of the dead animals show signs of tissue damage and bleeding at the site of insertion of the sampling tubes.

Jorge and Mariel are scheduled to perform the third round of surgeries in a week. What course of action should Mariel take?

#### **Discussion Questions**

- Even though she was upset by what had happened to the animals, what if Mariel chose the path of least resistance and took no action? Would this option be reasonable? Would it be ethical?
- Should Mariel point out her concerns about improper surgical technique to Jorge before the next round of surgeries? Should she confront him with the necropsy results?

#### **Part 2**

Suppose that despite Mariel's concerns Jorge refuses to take responsibility for the loss of the three sheep. He claims that the necropsy results are not conclusive proof that negligence on his part caused the internal injuries because the sheep's liver cancer could have predisposed them to these problems.

Despite Jorge's arguments, Mariel is not convinced that the sheep died simply because their weakened livers could not withstand the surgery. While she is not a veterinarian, her experience as a surgical technician leads her to conclude that what she saw was incorrect procedure.

#### **Discussion Questions**

1. Given Jorge's view of the situation, what options does Mariel have? Should she defer to his judgment as veterinarian in charge?
2. What should her next step be? Should she go to her adviser? Should she go directly to the animal care and use committee with her observations?

### **Part 3**

Consider an alternative scenario, in which the affected sheep do not die, but still show signs of pain and discomfort during the recovery period. Mariel's decisions may now include whether to euthanize the animals if they experience prolonged distress.

#### **Discussion Questions**

- Would the sheep's survival and distress affect your interpretation of this case?
- In a case such as this one, how do you weigh the issues of animal well-being versus the potential contributions to science that keeping the animals alive in this state might have?

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