Virtual Learning

Medical Interventions Xenotransplantation

May 20, 2020

Medical Interventions
Lesson: May 20, 2020

Objective/Learning Target:

Describe how xenotransplantation work, as well as their potential risks, benefits, challenges, and ethical or moral concerns. Defend arguments as to whether or not further research for xenotransplantation should be banned. (4.4.1)

Let's Get Started:

1. Review all of the organs on the interactive body simulation. Take note of how many people are waiting for organs.
2. 20 people die in the US everyday waiting for an organ transplant. What do you think is the main reason for this?

Let's Get Started: Answer

1. Review all of the organs on the interactive body simulation. Take note of how many people are waiting for organs.
2. 20 people die in the US everyday waiting for an organ transplant. What do you think is the main reason for this?
   a. There simply aren't enough donor organs for the growing demand

Lesson Activity

One strategy being developed to deal with the issue of a lack of organs is called Xenotransplantation. Learn about it by watching this video and reading this background information. Summarizing the information in your notebook and then answer these questions:

1. What is xenotransplantation?
2. How is HLA involved with xenotransplantation? What must be done to help prevent rejection?
3. Why is there a need for xenotransplantation?
4. Where do the animal tissues typically come from? Why these animals?

Lesson Activity - Answers

Learn about Xenotransplantation by watching this video and reading this background information. Summarizing the information in your notebook and then answer these questions?

1. What is xenotransplantation?
    a. Taking tissue/organs from one species and transferring to another
2. How is HLA involved with xenotransplantation? What must be done to help prevent rejection?
    a. Recognizes the organ as foreign and attacks organ; genetically modify animal tissue with HLA antigens
3. Why is there a need for xenotransplantation?
    a. Not enough organ donors to meet the growing demand
4. Where do the animal tissues typically come from? Why these animals?
    a. Pigs, sometimes baboon; similar structures/functions

Practice

Answer the following questions after completing the activity.

1. How does this technology work?
2. What are the potential risks of using this technology?
3. What are the potential benefits of using this technology?
4. What are the challenges of this technology?
5. What are the ethical or moral concerns of using this technology?

Practice - Answer

Answer the following questions after completing the activity.

1. How does this technology work?
   a. Taking animal organs/tissue/cells and placing them into humans
2. What are the potential risks of using this technology?
   a. Expose patient to animal virus and then to human population, might reject organ
3. What are the potential benefits of using this technology?
   a. Treatment of neurological diseases, increased organ supply
4. What are the challenges of this technology?
   a. Not enough knowledge of stem cells, much more research needed to ensure no organ rejection
5. What are the ethical or moral concerns of using this technology?
   a. Exploitation of animals, cloning animals for human transplants

Additional Practice/Resources

1. List at least three arguments for banning research for the technology and three in favor of further research. What is your opinion on this topic?
2. Learn about the current application of xenotransplantation with heart valve replacement and their benefits/drawbacks.
3. Learn more about how CRISPR-cas9 is once again helping solve the problem of organ rejection.