The Veterinary Black Bag Program

Project Goals:
- Develop Veterinarian’s Black Bags (VBBs) of instructional items and pamphlets for middle school teachers to support classroom visits by local veterinarians.
- Provide professional development for veterinarians and teachers on how to use items in the VBBs.
- Promote inquiry-based thinking about health-related subjects while emphasizing the value of biomedical research and promoting careers in science.

Vocabulary

Antibody – a protein molecule which fights bacteria or viruses in the body which is produced by the immune system in response to the presence of a disease causing agent (or vaccine)

Pertussis – more commonly known as whooping cough, this is a disease which affects the respiratory system

Diphtheria – a disease which attacks the nose and throat, it is potentially life threatening

Tetanus – a disease caused by the toxin produced by bacteria, the toxin attacks the nervous control of muscles causing the muscles to become rigid (aka lockjaw). It is fatal if not treated.

Polio – a viral disease which can cause paralysis and permanent disability

The instruction in this module includes:
Presentation on Animals in Research
Follow-up lessons on:
- Pros and Cons of Animal Research
- Animal Research: Case Study
- Care of Lab Animals

http://peer.tamu.edu/VBB/Summary.asp
Summary of Lesson Content

Students will use the results of a study done in 1957 to determine whether the polio and DPT vaccines are better given together or separately. The study was performed using monkeys and guinea pigs. The animals were injected with the vaccine being tested and their antibody (immune system response) levels were measured several weeks post-vaccination. Students will be given the results of tests and asked to make their own conclusions by creating and interpreting graphs.

Objectives

Students will:
1. Learn how scientists follow the scientific method in their research
2. Be able to explain how animal research has benefited human medicine
3. Correctly interpret data using graphs

Useful Background Information

This lesson is based on a study done in the 1950s on whether the DPT and polio vaccines were more effective when given together or separately. The tests were run on guinea pigs and monkeys over a few weeks. The animals were separated into three groups: one that received just the DPT vaccine, one that received just the polio vaccine and one that received both the DPT and polio vaccines at the same time. Each guinea pig received three shots in total over the course of the study. Each monkey received four shots in total over the course of the study. The scientists tested every animal’s blood for antibodies two weeks after each injection. So the guinea pigs’ blood was tested on the 2nd, 4th and 8th weeks and the monkeys’ blood on the 2nd, 4th, 11th and 17th weeks.

Polio is a disease caused by three separate strains of virus. To be immune to polio the subject must have antibodies to all three strains. So when testing how well the polio vaccine worked the scientists tested the blood of the injected animals for the three different antibodies – named Type I, II and III – to fully determine the effectiveness of the vaccine. The more antibodies in the blood the better the vaccine worked.

Useful Background Information, continued

The majority of students should have received the DPT and polio vaccinations as a baby. The DPT vaccination helps protect them from diphtheria, pertussis, and tetanus. The polio vaccine has helped to nearly eradicate the polio virus. Polio became a problem in the U.S. in the early 1900’s but thanks to research, including tests done on animals, a vaccine was developed. The Sabin vaccination, named for its inventor Albert Sabin, became the official polio vaccine in 1962.