Film Guide for Lorenzo's Oil

Please read these questions over before you see the film!!! Then consider and write them down on your own paper. (you do not have to use complete sentences)

[Sample correct answers are shown in red. In many cases there are equivalent (and considerably less detailed) correct answers. Especially for the longer answers, students were supposed to show basic understanding, and not necessarily a detailed answer.]

1. What is the disease that Lorenzo has?
   ALD. Also known as adrenoleukodystrophy.

2. What type of inheritance is Lorenzo's disease.
   Sex-linked, or X-linked.
   That is, it is carried on the X-chromosome. The trait is recessive. Since boys have only one X-chromosome, they will get the disease if they inherit the trait on the X-chromosome they get from their mother. Girls have another, normal, X-chromosome (from their father), and will therefore not get the disease, but will be carriers if the X they received from their mother is defective.

   So why is the father's X-chromosome guaranteed to be normal? Because if his were defective, he would have died in childhood, and wouldn't be anyone's father.

3. What is Lorenzo's Oil? How does it work? Use the sink model from the film.
   • 4 parts oleic acid to 1 part erucic acid.
   • It forces enzymes in the body to use oleic acid instead of saturated fatty acids.
   * It turns off the "synthesis" spout in the sink. (The other spout is the "intake" spout from food that is eaten.

4. Why did the medical community resist the Odenes' treatment ideas? Why did the parent support group resist? Give some examples for and against.
   • The responsibility of the medical community was to obtain evidence as to whether dietary restrictions benefited people with the disease. If people in the trial group began using other undocumented treatments, the validity of the study would be questionable, and nothing of value would be learned.
   • A lot of the children did benefit from the dietary restrictions, and their families saw the Odones as playing a destructive role. Further, since some of them had previous children who had died from the disease, they had some of the same goals as the doctors.
   * The doctors running the trials were responsible for documenting whether dietary restrictions helped. If parents wanted to do other experiments, they should not have joined the trial.
   • Parents are responsible for their child, not for the advancement of science or future victims. If they had joined the trial, they would still want to pursue anything that looked like a cure or a major benefit to their child.
5. How did modeling help solve the scientific problem? Can you think of other great discoveries that employed the use of models?
   • It clarified the fact that there were **two** sources of Very long chain saturated fatty acids (VLCSFAs) and if one were shut off, the increase could be due to an increase in the internal "synthesis" source.
   • The discovery of DNA.
   • Isaac Newton's discovery that the force that held the moon in its orbit was the same force that caused objects to fall to the ground.

6. Did the family's courage and persistence inspire you? How? Why? There are many possible correct answers.

7. Defend the position that diseases that affect a small % of the population should not get as much money for research as the big killers like cancer and heart disease. Resources are limited. Discretionary money should be directed to "the greatest good to the greatest number".

8. What do you think is the role of support groups? How did the support group affect the Odones? Any reasonable answer is acceptable.

9. What was found out from the Polish biochemist?
   That when rats ate oleic acid, their level of VLCFSAs went down.

10. What was the purpose of the ALD symposiums? What happens when scientists work in isolation?
    • The symposiums (symposia?) were intended to allow researchers working on related projects not directly connected with ALD to exchange information with the ALD researchers.
    • Scientists working in isolation are not always aware of other areas where their work could be extremely useful.

11. What is erucic acid?
    A long-chain unsaturated fatty acid. Like oleic acid, it suppresses the creation of VLCFSAs, but is much more effective.

12. How did the treatment for ALD really happen by accident? Can you think of any other times in medical history where an important discovery happened by mere chance?
    • Mr. Odone was not a doctor and would never have been involved in this except for the fact that his son Lorenzo had the disease.
    • The discovery of penicillin, the first antibiotic "wonder drug". The researcher looking for bacteria-fighting chemicals accidentally contaminated a sample with common bread mold, but decided to include the contaminated sample in the study anyway. Penicillin is manufactured by ordinary green bread mold.