**Baby, Don't Drink!**

Rob, a high school junior, was looking forward to his older sister, Angela, a senior in college, coming home for winter break. When she arrived, Rob noticed something very different about Angela. Over dinner one night, Angela told the family her news – she was pregnant and was about 4 months along. Her family agreed to help her however she needed it. A few days later, Rob and Angela went to a mutual friend's New Years Eve party. Rob noticed Angela was drinking a beer. Rob said to his sister, as he grabbed the beer out of her hand, “Angela, what are you doing? Don't you know that drinking alcohol can harm your baby?” Angela replied, “Rob, no wayÉdrinking is only harmful during the first trimester, and I'm already in my second trimester. Now give me my beer back!” Infuriated, Rob pulled his sister aside. “I just learned in my biology class at school that drinking alcohol can be harmful to the baby anytime during pregnancy and it can cause FASD—that's short for Fetal Alcohol Spectrum Disorders. Please tell me you haven't been drinking at college too!” exclaimed Rob. “Don't be silly Rob! I've been studying so much; I haven't had time to drink. This is the first chance I've had to relax. So what is this FASD all about? I've never heard of that before.”

When a woman who is pregnant drinks alcohol, her baby (fetus) is also exposed to alcohol. The alcohol causes a variety of problems in the fetus, ranging from physical abnormalities to brain damage. Doctors and scientists have named the group of disorders “Fetal Alcohol Spectrum Disorders” or FASD.

**1.** What are Fetal Alcohol Spectrum Disorders? There are 3 major ones.

**2.** Describe the facial abnormalities that result from prenatal alcohol exposure.

**3.** Which of the three FASD include facial abnormalities?

When the fetus is exposed to alcohol there can be several behavioral and cognitive (thinking) problems later in childhood.

**4.** Make a list of the most common behavioral problems.

**5.** Make a list of the most common cognitive problems.

**6.** What disorder do many of these problems resemble?

When a pregnant woman drinks alcohol, it enters her bloodstream through her gastrointestinal tract. Once in the blood, all of the alcohol reaches her fetus.

**7.** Why does alcohol get to the fetus so easily? (Hint: What properties of alcohol allow it to diffuse across membranes easily?)

**8.** What biological membranes does alcohol cross to get to the fetus?

**9.** How is alcohol eliminated from the fetus?

One way alcohol can damage cells in adults, adolescents and even fetuses is by generating reactive oxygen species.

**10.** What are reactive oxygen species? Which are most common?

**11.** How do reactive oxygen species cause damage to biological cells, especially neurons?

**12.** Why is the fetal brain sensitive to reactive oxygen species (2 answers)?

Angela thinks that her fetus will be harmed only if she drinks alcohol during the first trimester. Scientists and doctors have shown that this belief is a myth. Alcohol can damage the fetus during the entire pregnancy, but there will be differential effects depending on the time of exposure.

**13.** During what stage of pregnancy does alcohol cause structural problems in the fetus?

**14.** List the types of structural problems that can occur.

**15.** What other problems can occur from fetal alcohol exposure during all three trimesters?

One of the reasons that the fetal brain is so sensitive to alcohol-induced damage during pregnancy (and even during breast feeding) is because millions of neurons are being “born” at this time.

**16.** What is the term for the birth of new neurons?

**17.** Describe one way that alcohol inhibits the birth of new neurons.

There are specific areas of the brain in which the loss of new neurons, and damage to new neurons that do get born, result in behavioral and cognitive problems later in life. These areas include:

* Cerebral cortex
* Corpus callosum
* Hippocampus
* Cerebellum
* Caudate nucleus

**18.** For each of these areas, describe their normal function and the type of behavioral or cognitive problem that is produced by fetal alcohol exposure.

People who drink alcohol, including some pregnant women, may drink in different ways. For example, some drink a little bit o nce in a while and others drink several times a week. And others may even “binge drink” periodically.

**19.** What is binge drinking? Why would binge drinking harm the fetus?

**20.** What is the key feature that makes any of these patterns of drinking dangerous for a developing fetus?

**21.** What can a pregnant mother do to make sure her fetus won’t develop FASD?