Competency 1: Fetal Alcohol Spectrum Disorders
Foundation

1. Description
2. Pretest
3. Learning Objectives
4. Historic Findings Related to Alcohol Use by Pregnant Women
5. Changes in U.S. Perspectives on Alcohol Use During Pregnancy
6. Fetal Alcohol Spectrum Disorders: Terminology and Prevalence Rates
7. Effects of Alcohol on the Developing Embryo and Fetus
8. Effects of Alcohol on the Developing Brain
9. Relationship between Prenatal Alcohol Use and Fetal/Infant Death
10. Comparative Effects of Alcohol and Other Substances on the Developing Fetus
11. Issues Related to Professional Values and Ethics
12. Matching Activity
13. Posttest
14. References
Competency 1: Fetal Alcohol Spectrum Disorders Foundation

Description

This competency describes historic findings related to alcohol use by pregnant women, U.S. perspectives on drinking during pregnancy, terminology related to fetal alcohol spectrum disorders (FASD), prevalence rates of FASD, and effects of alcohol on the fetus. It also discusses professional values and ethics related to the counselor's role in counseling women who have used alcohol during their pregnancies.
Test Your Knowledge Questions: Pretest

Pretests are designed to gauge your knowledge. Click in the circle or box next to the correct answer. Circles indicate that only one correct answer is possible. Boxes indicate that more than one correct answer is possible. A posttest is given at the end of the module so that you can see what you've learned.

1. In 1973, who identified a specific pattern of malformations and deficits in children of alcoholic mothers?
   - A. Dr. William Sullivan
   - B. Johnson and Johnson
   - C. Jones and Smith
   - D. IOM

2. Which of the following are major components of FAS?
   - A. Growth deficiencies such as low birth weight
   - B. Brain damage with neurologic deficits such as impaired fine motor skills, poor eye-hand coordination, and tremors
   - C. Maternal alcohol use during pregnancy
   - D. All of the above

3. When a pregnant woman drinks, the blood alcohol level of the fetus becomes equal to or greater than the mother’s.
   - True
   - False

4. In what year did the U.S. Surgeon General issue warnings against alcohol use during pregnancy?
   - A. 1970
   - B. 1980
   - C. 1981
   - D. 1977

5. How does the rate for FASD compare with the rate of Down syndrome or spina
bifida?

- A. Higher
- B. Lower
- C. Equal

6. Which substance produces the most serious neurobehavioral effects in the fetus?

- A. Tobacco
- B. Heroin
- C. Cocaine
- D. Alcohol

7. The brain develops throughout pregnancy. Alcohol exposure at any time during the pregnancy can cause brain damage.

- True
- False

8. The terms FASD and FAS are interchangeable.

- True
- False

9. Based on which of the following factors do women experience the damaging consequences of chronic alcohol use more severely and rapidly than men?

Select all that apply.

- A. Psychosocial
- B. Visual
- C. Medical
- D. Physiological

10. Women respond to alcohol differently than men do. These differences include:

Select all that apply.

- A. Co-occurring problems and issues interacting with alcohol use
- B. Patterns of alcohol abuse
- C. Context for the initiation and maintenance of alcohol abuse
D. Problems and consequences ensuing from alcohol abuse
Learning Objectives

After completing Competency 1, the learner should be able to:

- Understand the significance of alcohol use disorders among women
- Identify areas in which alcohol use disorders in women differ from those in men
- Describe the basic historic foundation of FASD
- Discuss the basic terminology related to FASD and the prevalence rates
- Explain the effects of maternal alcohol exposure on the developing embryo and fetus
- Compare the adverse effects of alcohol on the developing fetus to those of other substances
- Identify issues related to professional values and ethics
Throughout history, women generally have used alcohol. Women now account for an estimated one-third of Americans with alcohol abuse or alcohol dependence disorders.¹ Research over the last two decades shows that women respond to alcohol differently than men do. Differences are found in:

- Predisposing factors contributing to the development of alcohol abuse
- Patterns of alcohol abuse
- Context within which the alcohol abuse is initiated and maintained
- Problems and consequences ensuing from alcohol abuse
- Co-occurring problems and issues interacting with alcohol abuse

Based on epidemiologic factors, physiologic effects, and psychosocial and medical factors, women experience the damaging consequences of chronic alcohol use more severely and rapidly than men.

A major issue related to alcohol and women is alcohol use during pregnancy. Drinking during pregnancy is associated with a variety of health consequences for the woman and her child. Current estimates indicate that 5 percent of women of childbearing age are heavy drinkers (five or more drinks on the same occasion on 5 or more days). Nearly one-quarter of women of childbearing age engage in binge drinking (four or more drinks on the same occasion, meaning at the same time or within a couple of hours of each other).¹ Both heavy and binge drinking increase the risk of harm to a fetus.

For centuries, people have known that alcohol can harm a fetus. In the 17th century, Sir Francis Bacon warned women against drinking alcohol while pregnant. Since then, knowledge about alcohol and pregnancy has increased, leading to preventive measures such as government warnings about the dangers of alcohol use during pregnancy. As far
back as the 18th century, the British government recognized the impact of alcohol on pregnancy outcomes and took steps to reverse dangerous trends.

The Gin Epidemic in England in the 1700s is believed to have led to alcohol-related birth defects. When the gin tax was lifted, the price went down. Drinking went up, and so did infant deaths.\textsuperscript{2} In 1751, the government imposed sales restrictions.

In time, the problem was more widely recognized. In 1834, a British House of Commons report stated that "infants of alcoholic mothers often have a starved and imperfect look."\textsuperscript{3} About 30 years later, a French physician described children exposed to alcohol as having small heads, peculiar facial features, and "nervousness."\textsuperscript{2}

Near the end of the 19th century, many researchers began to examine the effects of alcohol on the fetus. For example, in 1899, Dr. William Sullivan compared the pregnancy outcomes in 120 alcoholic prisoners with 28 of their blood relatives. The infant death rate was 20 percent higher among the women with alcohol problems.\textsuperscript{2} Such studies continued into the early 20th century.
Historic Findings Related to Alcohol Use by Pregnant Women, Continued

Twentieth Century

For decades, physicians thought that the placenta provided a protective barrier that would prevent teratogens such as alcohol from reaching the fetus. Many believed children of alcoholics had defects related to poor genetic stock rather than alcohol exposure. That was the conclusion in a 1946 article in the Journal of the American Medical Association.

French researchers began to study alcohol and pregnancy in the 1950s. An unpublished thesis reported the prenatal effects of alcohol on children born to alcoholic parents. In 1968, Dr. Paul Lemoine published a study of 127 children from 69 French families. Twenty-five children had distinct features related to prenatal alcohol exposure. Dr. Lemoine called this alcoholic embryopathy.

A few years later, Christy Ulleland, a pediatric resident in Seattle, became interested in babies with failure to thrive. She noticed that many had alcoholic mothers. In reviewing delivery records, she found more babies that fit the pattern. Her colleagues, Drs. David Smith and Kenneth Jones, asked to have all the children examined at one time.

In 1973, Jones and Smith identified a specific pattern of malformations, growth deficiencies, and central nervous system defects in 10 children of alcoholic mothers. Their study not only noted the connection between prenatal alcohol and developmental disabilities, but gave it a name: fetal alcohol syndrome (FAS). It was originally believed that malnutrition might be responsible for these defects. However, the pattern of malformation associated with FAS is not seen in children born to malnourished women. In addition, alcohol has been found to be acutely toxic to the fetus independently of the effects of malnutrition.

Similar cases were found in Germany, France, and Sweden. As a result, FAS prevention programs were developed in the late 1970s.
Changes in U.S. Perspectives on Alcohol Use During Pregnancy

It has taken some time for the United States to recognize the dangers of alcohol use during pregnancy. Although no safe level of alcohol consumption during pregnancy has been determined, some physicians still tell their patients that it is okay to have a drink "now and then." Even people who knew alcohol could harm a fetus were reluctant to say anything to pregnant friends or relatives for fear of causing undue stress or jeopardizing the relationship.

In the past couple of decades, attitudes and practices have begun to change. In 1981, the Surgeon General recommended warnings against alcohol use during pregnancy. Congress passed the Alcoholic Beverage Labeling Act in 1988, which required alcoholic beverage labels to carry a warning about birth defects. Today, 19 States and the District of Columbia have laws requiring warning signs at the point of sale about the dangers of alcohol use during pregnancy.

In February 2005, the Surgeon General issued an updated advisory on alcohol and pregnancy. He urged pregnant women and women planning to become pregnant to abstain from drinking alcohol. His advisory also urged health professionals to inquire routinely about alcohol consumption by women of childbearing age and advise them about the risks of drinking while pregnant.

Despite these warnings, 1 in 9 pregnant women drinks alcohol. Nearly 1 in 20 pregnant women engage in binge drinking (four or more drinks in one sitting). In addition, about half of all pregnancies are unplanned. Women who binge drink before conceiving are more likely to engage in other risky behaviors, including drinking during pregnancy.
Fetal Alcohol Spectrum Disorders: Terminology and Prevalence Rates

Experts now know that the effects of prenatal alcohol exposure extend beyond FAS. "Fetal alcohol spectrum disorders" is an umbrella term describing the range of effects that can occur in an individual whose mother drank alcohol during pregnancy. These effects may include physical, mental, behavioral, and/or learning disabilities with possible lifelong implications. The term FASD is not intended for use as a clinical diagnosis. 

FASD refers to conditions such as:

- Fetal alcohol syndrome, including partial FAS
- Alcohol-related neurodevelopmental disorder (ARND)
- Alcohol-related birth defects (ARBD)

FAS consists of a pattern of neurologic, behavioral, and cognitive deficits that can interfere with growth, learning, and socialization. FAS has four major components:

- A characteristic pattern of facial abnormalities (small eye openings, indistinct or flat philtrum, thin upper lip)
- Growth deficiencies, such as low birth weight
- Brain damage, such as small skull at birth, structural defects, and neurologic signs, including impaired fine motor skills, poor eye-hand coordination, and tremors
- Maternal alcohol use during pregnancy

Behavioral or cognitive problems may include mental retardation, learning disabilities, attention deficits, hyperactivity, poor impulse control, and social, language, and memory deficits. Partial FAS describes persons with confirmed alcohol exposure, facial anomalies, and one other group of symptoms (growth retardation, central nervous system defects, or cognitive deficits).

ARND refers to various neurologic abnormalities, such as problems with communication skills, memory, learning ability, visual and spatial skills, intelligence, and motor skills. Children with ARND have central nervous system deficits but few or no facial
abnormalities. Their problems may include sleep disturbances, attention deficits, poor visual focus, increased activity, delayed speech, and learning disabilities.

ARBD describes defects in the skeletal and major organ systems. Virtually every defect has been described in some patient with FAS. They may include abnormalities of the heart, eyes, ears, kidneys, and skeleton, such as holes in the heart, underdeveloped kidneys, and fused bones.
Fetal Alcohol Spectrum Disorders: Terminology and Prevalence Rates, Continued

Prevalence

Experts are unsure exactly how many individuals in the United States have an FASD. Studies by the Centers for Disease Control and Prevention have reported FAS prevalence rates from 0.2 to 1.5 cases per 1,000 births across various populations. Other studies using a variety of methods have produced estimates ranging from 0.5 to 2.0 cases per 1,000 live births. Such rates are comparable with or above other common developmental disabilities such as Down syndrome or spina bifida.

Some experts estimate that an FASD occurs in 10 in 1,000 live births. Thus, of 4 million infants born each year, an estimated 40,000 will be born with an FASD. Studies of particularly vulnerable populations yield even higher prevalence estimates. For example, some Native Americans have FAS rates as high as 3 to 5 per 1,000 children.

Because of the challenges of establishing accurate and timely prevalence information, the number of cases of fetal alcohol spectrum disorders could be greater than current data indicate. These challenges include:

- **Lack of specific and uniformly accepted diagnostic criteria.** Only recently have diagnostic guidelines been established for FAS. No uniform guidelines exist for other types of fetal alcohol spectrum disorders. Thus, health providers are hampered in their efforts to screen and identify children with an FASD.

- **FAS diagnosis based on clinical examination of features, but not all children with FAS look or act the same.** Because each symptom has a broad range of possible diagnoses, a clinician might miss or misdiagnose an FASD. For instance, physicians are aware of the high prevalence of attention deficit/hyperactivity disorders but might not link attention problems to an FASD.

- **Lack of knowledge and misconceptions among primary care providers.** Many professionals believe that an FASD can only occur if the mother is an alcoholic, poor, African American, or Native American. Few know about the full range or progressive nature of the neurobehavioral symptoms that result from prenatal exposure to alcohol.
Effects of Alcohol on the Developing Embryo and Fetus

Alcohol is a teratogen, a substance that can harm a fetus. When a pregnant woman drinks, alcohol easily crosses the placenta and enters the bloodstream of the fetus through the umbilical cord. The blood alcohol level of the fetus can be even higher than the mother's. It remains high longer, because the fetus cannot break down alcohol the way an adult can.  

Researchers do not know the amount or timing of alcohol consumption that causes damage. There is no exact threshold amount. As few as one drink per week may cause damage.  

A standard drink is 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of liquor. Binge drinking, four or more drinks in one sitting, can be especially harmful. Higher levels of consumption increase the risk of fetal damage. Maternal metabolism and alcohol's interaction with other drugs are also factors that affect the amount of damage to the fetus.

The only statement that can be made with complete accuracy is that zero exposure equals zero risk. Therefore, no woman should drink at any point during her pregnancy. Women who had alcohol before knowing they were pregnant should stop drinking immediately. Doing so can reduce the risk of fetal harm. Research has established maternal alcohol consumption as a leading preventable cause of birth defects and childhood disabilities in the United States.

FASD occurs after fertilization and is not caused by sperm. By definition, FASD cannot be caused by the father. The only cause of FASD is drinking alcohol during pregnancy.
Findings are mixed on the effects of male alcohol use before conception. Some studies cite no discernible effects. Others show that sons of fathers who drank alcohol have memory deficits, hyperactivity, and other neurologic problems. There has also been some research that suggests that alcohol use can affect the motility of sperm. The only way to completely avoid risk is for both parents to be alcohol free prior to conceiving a child and for the mother to abstain from drinking alcohol throughout her pregnancy.

Men may not cause FASD, but they have a very important role to play in preventing FASD. They can encourage women not to drink during pregnancy. They also can support and respect a woman's decision not to drink. Men can also be role models for their significant others. By not drinking themselves, they are modeling the safest behavior for pregnant women. Men can also help women get alcohol treatment and follow their treatment plans. These actions can help women remain alcohol free during their pregnancies.
Effects of Alcohol on the Developing Brain

Alcohol can damage the developing brain when it crosses the placenta. Since the brain develops throughout pregnancy, alcohol exposure at any time can cause brain damage. Prenatal exposure to alcohol can change the brain structurally in ways that can be viewed and measured, including:

- Small head (microcephaly), usually below the 10th percentile.
- Hydrocephalus, an abnormal accumulation of fluid that causes the brain and skull to enlarge.
- Absence of the corpus callosum, an area of the brain that contains nerve fibers that bridges the two hemispheres of the brain. MRIs have shown completely missing areas of the brain in individuals with an FASD.
- Abnormal cysts or cavities in the brain.
- Neurologic problems, such as seizures, tremors, and poor fine motor skills.
- Patterns of dysfunction on psychometric tests.

Prenatal exposure to alcohol also can change the function of different parts of the brain, leading to deficits in executive functioning, memory, word retrieval, concrete thinking, cognitive flexibility, sensory integration difficulties, and sleep disturbances. The damage can lead to developmental delays, learning disabilities, and behavior problems, such as:

- Mental retardation
- Problems with attention
- Hyperactivity
- Poor impulse control
- Problems in social perception
- Speech and language delays or deficits
- Poor capacity for abstract thinking
- Specific deficits in math skills
- Poor judgment
- Problems with cause and effect
- Problems anticipating consequences
- Problems changing behavior or response in different situations
Effects of Alcohol on Specific Brain Function

Alcohol can affect specific parts of the brain in ways that impair several functions.  

- **Corpus Callosum.** The corpus callosum connects the two hemispheres of the brain, allowing the left and right sides to communicate. Prenatal alcohol exposure can cause abnormalities such as thinning or complete absence. These have been linked to deficits in attention, intellectual function, reading, learning, verbal memory, executive function, and psychosocial functioning.

- **Hippocampus.** The hippocampus is involved in memory, but its precise function is uncertain. Alcohol can change the fibers and cause cell reduction. Some persons with prenatal alcohol exposure have deficits in spatial memory and other memory functions associated with the hippocampus. The hippocampus also acts as a mood control center. Damage to the hippocampus can affect the ability to respond appropriately to emotions, such as anger.

- **Basal Ganglia.** The basal ganglia are nerve cell clusters involved in motor abilities and cognitive functions. Heavy prenatal alcohol exposure can reduce basal ganglia volume. This can affect skills related to perception, such as the ability to manage time or inhibit inappropriate behavior.

- **Cerebellum.** The cerebellum is involved in both motor and cognitive skills. The cerebellum tends to be smaller in people with an FASD. Damage to the cerebellum can cause learning deficits and problems with motor skills, such as balance and coordination.

- **Hypothalamus.** The hypothalamus helps maintain the body's internal environment through the receipt of sensory and chemical input. It controls areas such as appetite, emotions, temperature, and pain sensation. Persons with an FASD may not experience pain or respond appropriately to hot or cold.

- **Frontal Lobes.** The frontal lobes control executive functions, such as planning and problem solving. They also control impulses and judgment. Frontal lobes can be smaller in teenagers and young adults prenatally exposed to alcohol. Persons with an FASD may have poor impulse control and self-monitoring. They might engage in risky or illegal activity to fit in with peers.
Researchers identified an association between prenatal alcohol exposure and fetal death more than 20 years ago. The likelihood of miscarriage increased directly with alcohol consumption. Risk was twice as high in women consuming 1 ounce of absolute alcohol as infrequently as twice a week. More recently, fetal mortality was found to be 77 percent higher when alcohol was consumed during pregnancy. Prenatal alcohol exposure is also associated with a higher rate of infant death.

A related research finding was that siblings of children with FAS had increased risk of death due to infectious illness and sudden infant death syndrome (SIDS) compared with controls. A diagnosis of FAS is an important risk marker for mortality in siblings of an individual with FAS even if the siblings do not have FAS. Maternal alcoholism appears to be a useful risk marker for increased mortality risk in diagnosed cases and their siblings. In some populations, such as Northern Plains Indians, binge drinking (four or more drinks on one occasion) in the first trimester was associated with an increased risk of SIDS.
Comparative Effects of Alcohol and Other Substances on the Developing Fetus

Commonly abused substances include:

- Alcohol
- Tobacco
- Heroin
- Methadone
- Cocaine
- Marijuana
- Prescription drugs

Of these, alcohol produces by far the most serious neurobehavioral effects in the fetus. Of these, alcohol produces by far the most serious neurobehavioral effects in the fetus.40

The table shows various effects of different substances. Only alcohol can produce all of the noted problems. In addition, combinations of substances (e.g., alcohol and tobacco) can produce more serious effects than either substance alone. Many women use multiple substances.

<table>
<thead>
<tr>
<th>Substances</th>
<th>Growth deficiency</th>
<th>Behavior problems</th>
<th>Cognitive problems</th>
<th>Motor deficits</th>
<th>Developmental delays</th>
<th>Facial anomalies</th>
<th>Physical defects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Tobacco</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Opioids</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Amphetamines</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Marijuana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>PCP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Issues Related to Professional Values and Ethics

The role of the counselor in addiction treatment is to provide support and education. Addiction professionals also need to use treatment approaches that help women move from unhealthy, self-defeating, self-devaluing behaviors to healthy, self-enhancing, and self-nurturing behaviors. The counselor needs to understand the roots of alcohol abuse among women, as well as symptoms, motivation, problems, and issues to enhance engagement and treatment effectiveness.

It is important for the addiction professional to know and believe that women do not try to hurt their babies. Cases of women drinking to induce a miscarriage or harm the baby are very rare. Most women want healthy babies, but some cannot stop drinking, even when they are pregnant. Addiction professionals can provide needed support and understanding as women go through the difficult process of recovery.

Clients often feel a great deal of shame associated with their addictive behaviors. Some clients may learn about FASD and realize that their children might have an FASD. This discovery can increase their guilt and shame when they realize they have harmed their children permanently. Alcohol problems already carry a tremendous stigma in our society, particularly when women drink. To help resolve those feelings of shame and guilt, the counselor should encourage the client to speak honestly about her addictive behaviors and respond to the client with honesty, gentleness, and care.
Counselor, Know Thyself

Learning about FASD can raise many issues for addiction professionals. Addiction professionals have been socialized within a society that takes punitive measures against women who abuse alcohol during pregnancy. Elements of this attitude may consciously or subconsciously exist within the professional. Perhaps they have a preconceived notion about how pregnant women are supposed to act, feel, or think. They may have insufficient knowledge and skills to build relationships that are respectful and safe for women to explore painful issues such as having a child with an FASD.

It is important for counselors to be aware that their own background, socialization, and experiences influence the therapeutic relationship. These include their personal experience with alcohol use disorders, as well as their attitudes, values, and biases. Addiction professionals need to recognize the limits of their competencies and expertise. A counselor's self-assessment regarding his or her knowledge of women-specific alcohol use disorders and appropriate women-specific interventions can help in establishing a starting point and planning strategies for building capacity and quality care.

Many addiction professionals are recovering from alcohol use disorders. Others have no alcohol abuse history of their own but have been close to someone else's active addiction. This firsthand experience of addiction can add to the counseling process. In some cases, it may complicate the process. Counselors might recognize signs and symptoms of FASD in their own children and have feelings of guilt and shame.

When professionals have not come to grips with their own issues, they sometimes project these issues onto others. Often the pain and chaos of clients' lives can trigger their own intense pain and fear. It is important to seek help to resolve these feelings and to get help for one's children. Recognizing these feelings and addressing them can help the counselor set limits and protect boundaries and avoid transferring these feelings to the client. In addition, it can help the counselor avoid self-disclosure that might make clients uncomfortable or shift the focus to the counselor. The focus must always be on the client's recovery.
## Matching Activity

Match the word or term in column A with the appropriate description in column B.

Type letter from column A into correct answer box in column B.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Alcoholic embryopathy</td>
<td>□ Fetal alcohol spectrum disorders</td>
</tr>
<tr>
<td>B) Fetal Alcohol Syndrome</td>
<td>□ A term identified by Dr. Lemoine that describes the distinct features related to prenatal alcohol exposure</td>
</tr>
<tr>
<td>C) Alcoholic Beverage Labeling Act of 1988</td>
<td>□ Pattern of neurologic, behavioral, and cognitive deficits that can interfere with learning, growth, and socialization</td>
</tr>
<tr>
<td>D) FASD</td>
<td>□ A law requiring alcoholic beverage labels to carry a warning about birth defects</td>
</tr>
<tr>
<td>E) Components of FAS</td>
<td>□ Facial abnormalities, growth deficiencies, brain damage, prenatal alcohol exposure</td>
</tr>
</tbody>
</table>
Test Your Knowledge Questions: Posttest

Posttests are designed to gauge what you've learned by reading the competency. Click in the circle or box next to the correct answer. Circles indicate that only one correct answer is possible. Boxes indicate that more than one correct answer is possible.

1. When a pregnant woman drinks, the blood alcohol level of the fetus becomes equal to or greater than the mother’s.
   - True
   - False

2. In what year did the U.S. Surgeon General issue warnings against alcohol use during pregnancy?
   - A. 1970
   - B. 1980
   - C. 1981
   - D. 1977

3. Which substance produces the most serious neurobehavioral effects in the fetus?
   - A. Tobacco
   - B. Heroin
   - C. Cocaine
   - D. Alcohol

4. In 1973, who identified a specific pattern of malformations and deficits in children of alcoholic mothers?
   - A. Dr. William Sullivan
   - B. Johnson and Johnson
   - C. Jones and Smith
   - D. IOM

5. The brain develops throughout pregnancy. Alcohol exposure at any time during the pregnancy can cause brain damage.
6. The terms FASD and FAS are interchangeable.

   - True
   - False

7. Women respond to alcohol differently than men do. These differences include:

   Select all that apply.
   - A. Co-occurring problems and issues interacting with alcohol use
   - B. Patterns of alcohol abuse
   - C. Context for the initiation and maintenance of alcohol abuse
   - D. Problems and consequences ensuing from alcohol abuse

8. Based on which of the following factors do women experience the damaging consequences of chronic alcohol use more severely and rapidly than men?

   Select all that apply.
   - A. Psychosocial
   - B. Visual
   - C. Medical
   - D. Physiological

9. How does the rate for FASD compare with the rate of Down syndrome or spina bifida?

   - A. Higher
   - B. Lower
   - C. Equal

10. Which of the following are major components of FAS?

    - A. Growth deficiencies such as low birth weight
    - B. Brain damage with neurologic deficits such as impaired fine motor skills, poor eye-hand coordination, and tremors
    - C. Maternal alcohol use during pregnancy
D. All of the above
References


