New Findings on Fetal Alcohol Spectrum Disorders (FASD)

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As required by the Alcohol Policy 18 Conference, I/we have signed a disclosure statement and note the following conflict(s) of interest:

None
World Health Organization
Three Alcohol Policy Actions

- Increasing alcohol beverage excise taxes
- Restricting access to retail alcohol beverages, and
- Comprehensive advertising, promotion and sponsorship bans
Misconception/Reality: It is not second-hand

- Devastating consequences
- Lifelong consequences
- Costly consequences
- Consumers need to know
 Alcohol is actually a Teratogen

**Definition:** *any substance, organism, or process that causes malformations in a fetus*

- Teratogens include certain drugs (such as thalidomide), infections (such as German measles), ionizing radiation, and alcohol.

Thus alcohol is actually more damaging than cocaine, even heroin.

Since 1973 science has known that a beer a day can cause Fetal Alcohol Syndrome
How Teratogens Influence Prenatal Development

- Impact of teratogen depends on organism genotype
- Impact of teratogens changes over course of prenatal development and depends on dose
- Each teratogen affects a specific aspect (or aspects) of prenatal development
- Damage is not always evident at birth
Fetal Alcohol Spectrum Disorders

- Fetal Alcohol Syndrome
- Alcohol Related Neurodevelopmental Disorder
- Partial Fetal Alcohol Syndrome
- Alcohol Related Birth Defect
- Neurodevelopmental Disorder-Prenatal Alcohol Exposure

Fetal Alcohol Spectrum Disorders (FASD), an umbrella term intended to encompass all individuals along a broad continuum of clinical deficits related to prenatal alcohol exposure.

Mac Thanks you for learning about FASD
To learn More about FASD
www.nofas.org
United States Prevalence Rates

- Phillip May, Christina Chambers 2018
- 2- 7% (with some areas up to 9%)
- 1st graders (60% of parents gave permission)
- 10% of pregnant women report binge drinking, putting 100,000 babies at risk a year
- US population: 327,421,076
  - 3% = 9,822,633
  - 5% = 16,371,053
What about the babies of social drinkers?

- Light drinking during pregnancy causes lifelong impairments/brain damage.

- CDC High risk women:
  - Caucasian
  - Highly educated
  - Living in upper middle class families
# Fetal Development Chart

This chart shows vulnerability of the fetus to defects throughout 38 weeks of pregnancy.*

* = Most common site of birth defects

<table>
<thead>
<tr>
<th>Period of the Ovum</th>
<th>Period of the Embryo</th>
<th>Period of the Fetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeks 1-2</td>
<td>Week 3</td>
<td>Week 12</td>
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<td>Week 4</td>
<td>Week 16</td>
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<td>Week 5</td>
<td>Weeks 20–36</td>
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<td>Week 6</td>
<td>Week 38</td>
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<td>Week 7</td>
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<td>Week 8</td>
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- **CNS**: Central Nervous System
- **Heart**
- **Eyes**
- **Arms/Legs**
- **Teeth**
- **Palate**
- **External Genitals**
- **Ears**

Period of development when major defects in bodily structure can occur.

Period of development when major functional defects and minor structural defects can occur.

*Adapted from Moore, 1993 and the National Organization on Fetal Alcohol Syndrome (NOFAS) 2009

*This fetal chart shows the 38 weeks of pregnancy. Since it is difficult to know exactly when conception occurs, health care providers calculate a woman’s due date 40 weeks from the start of her last menstrual cycle.
Notochord development
Facial Characteristics

- Low nasal bridge
- Epicanthal folds
- Minor ear abnormalities
- Indistinct philtrum
- Micrognathia
- Short palpebral fissures
- Flat midface and short nose
- Thin upper lip
Corpus Callosum Abnormalities

Mattson et al., 1994; Mattson & Riley, 1995; Riley et al., 1995
Alcohol permanently changes what is developing at the time.

5 months

7-9 months
Cell Body

- Axon
- Myelin sheath
- Schwann cell
- Node of Ranvier

Cell Body

- Dendrites
- Nucleus
- Synapses

Synaptic terminals
<table>
<thead>
<tr>
<th></th>
<th>MRI Scans</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(A) Typically developing 10-year-old male, unexposed child</td>
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<tr>
<td></td>
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<tr>
<td>B</td>
<td>(B) 11-year-old male child with partial fetal alcohol spectrum disorders</td>
</tr>
<tr>
<td></td>
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<tr>
<td>C</td>
<td>(C) 7-year-old female child with FAS</td>
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<tr>
<td></td>
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<tr>
<td>D</td>
<td>(D) 14-year-old male child with FAS</td>
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</tbody>
</table>
Brain Imaging

- Diffusion Tensor Imaging (DTI)

Corpus Callosum
- Decreased integrity of white matter
- Malformed, underdeveloped
Newborn
Problems Processing Information

- Input
- Integration
- Memory
- Output
Characteristics of FASD

Remember: these affect each individual differently!

Primary – brain based
- Impulsivity
- Memory failure
- Anxiety/depression
- Concrete thinking
- Sensory disorders
- Time management
- Dysmaturity

Secondary – trauma based
- Social isolation
- School/employment breakdown
- Alcohol/other drug misuse
- Family breakdown
- Homelessness
- Trouble with the law
What currently happens to most children with FASD?

- Early Childhood - when they do/perform the best they’re going to do in our system
- Elementary Grades - we start to see problems
- Middle/Junior High - they start to fall through the cracks
- High School - we lose most of them
- Early Adult Life – the toughest time
Early Childhood
3rd Grade (age 8)
5th Grade (age 10)
In addition to altered brain structure, prenatal alcohol exposure is also associated with impaired brain function.

Children with FASD show greater brain activation in the frontal cortex when performing the same level of task demands, compared to normal controls.
Middle School (ages 11-13)
High School (ages 14-18)
Then comes the proverbial Edge of the Cliff...
Adult Life
Alcohol has a direct effect.

It is not second hand.
Inform Customers to Curb Liability?

- FASD Realities are now well known.
- Mommy might love wine, but if she drinks during pregnancy, her baby will not have the brain or the potential he or she would have had, etc.
- The decision to drink socially during pregnancy alters the baby’s lifelong potential and the future of the entire family.
We now know enough.

It's time we do better for prevention.