

**Alcohol use during pregnancy:
What we've learned and challenges we face
in preventing
fetal alcohol spectrum disorders**

October 28, 2011

Therese Grant, Ph.D.

Associate Professor of Psychiatry and Behavioral Sciences

Ann Streissguth Endowed Professor of Fetal Alcohol Spectrum Disorders

Director, Fetal Alcohol and Drug Unit

University of Washington School of Medicine

Seattle, Washington

granttm@uw.edu



"Behold, thou shalt conceive
and bear a son: and now drink
no wine or strong drinks."

- JUDGES 13:7

*"Foolish, drunken and harebrained
women most often bring forth
children like unto themselves,
morose and languid."*

- ARISTOTLE

True or False?

- Most people with FASD are mentally retarded.
- FAS is more severe than FASD.
- People grow out of FASD.
- People with FASD can't learn from mistakes.
- FASD means infants are born drunk.
- People with FASD can't be treated.

Alcohol is a Teratogen

- A substance that has the potential to damage the fetus when exposure occurs during pregnancy (other examples: radiation, thalidomide).
- Degree of damage depends on timing and dose of exposure.
- If timing and dose are below the teratogenic threshold, exposure may not cause malformation.

Alcohol is a Teratogen

The adverse impact of prenatal alcohol exposure was identified in 1968 by Dr. Christy Ulleland & colleagues at the UW.

**Fetal Alcohol Syndrome (FAS)
was named in 1973
by Dr. David Smith and Dr. Ken Lyons
Jones at the UW.**

Fetal Alcohol Syndrome (FAS)

- A specific, permanent birth defect caused by maternal alcohol use during pregnancy.
- A medical diagnosis: Q86.0 in the International Classification of Diseases (ICD-10).
- The leading *preventable* cause of mental retardation in the Western world.



Central Nervous System Dysfunction
Organic Brain Damage

- **Hyperactivity, attentional deficits**
- **Intellectual deficits, learning disorders**
- **Problems with memory, language & judgment**
- **Developmental delay, microcephaly**
- **Fine & gross motor problems**
- **Mental retardation, seizure disorder**



Discriminating Features

short palpebral fissures

flat midface

short nose

indistinct philtrum

thin upper lip

Associated Features

epicanthal folds

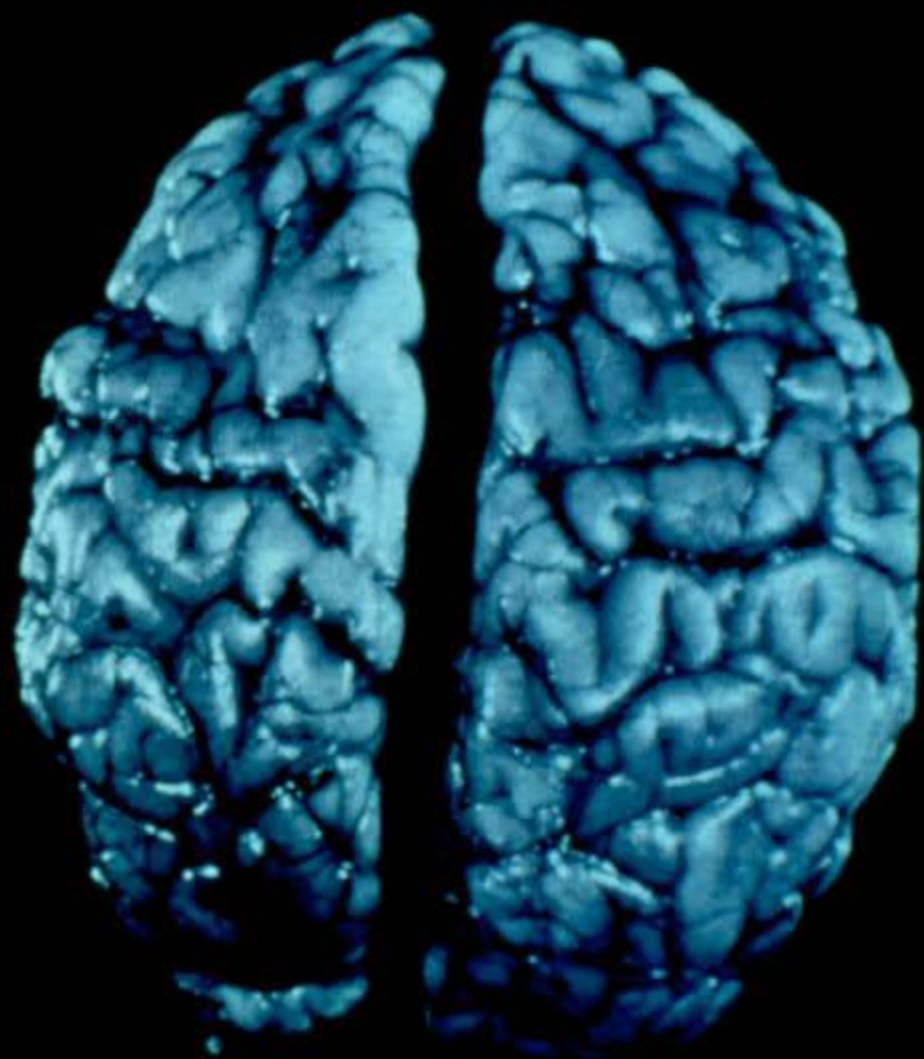
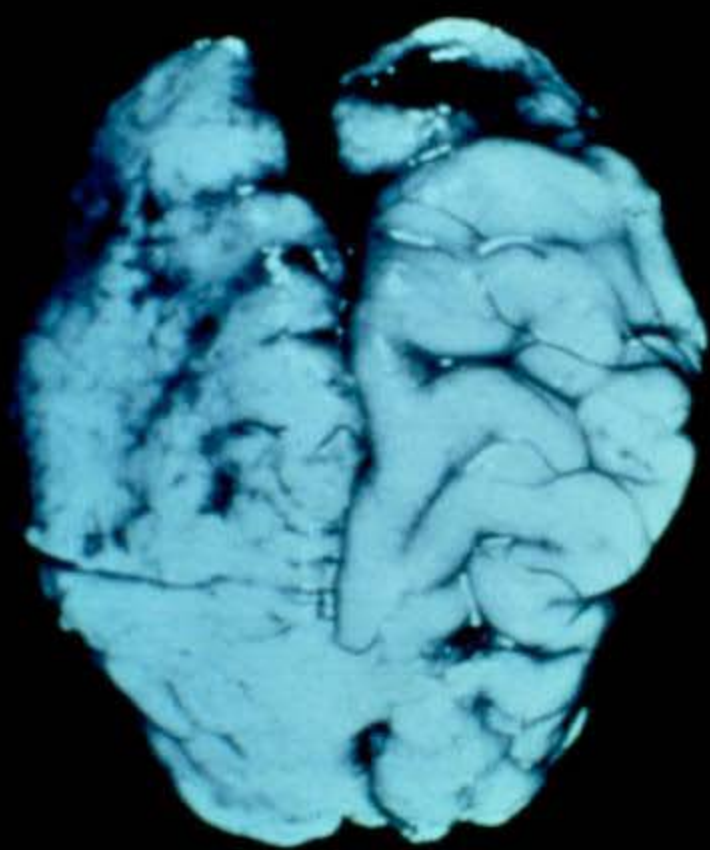
low nasal bridge

minor ear anomalies

micrognathia

In the Young Child





Fetal Alcohol Spectrum Disorders (FASD)

- Umbrella term describing a range of effects – possibly lifelong- that can occur in a person whose mother drank alcohol during pregnancy.
- Not a medical diagnosis.
- The brain is the organ typically affected; it can be damaged even in the absence of facial or other physical characteristics.



FASD

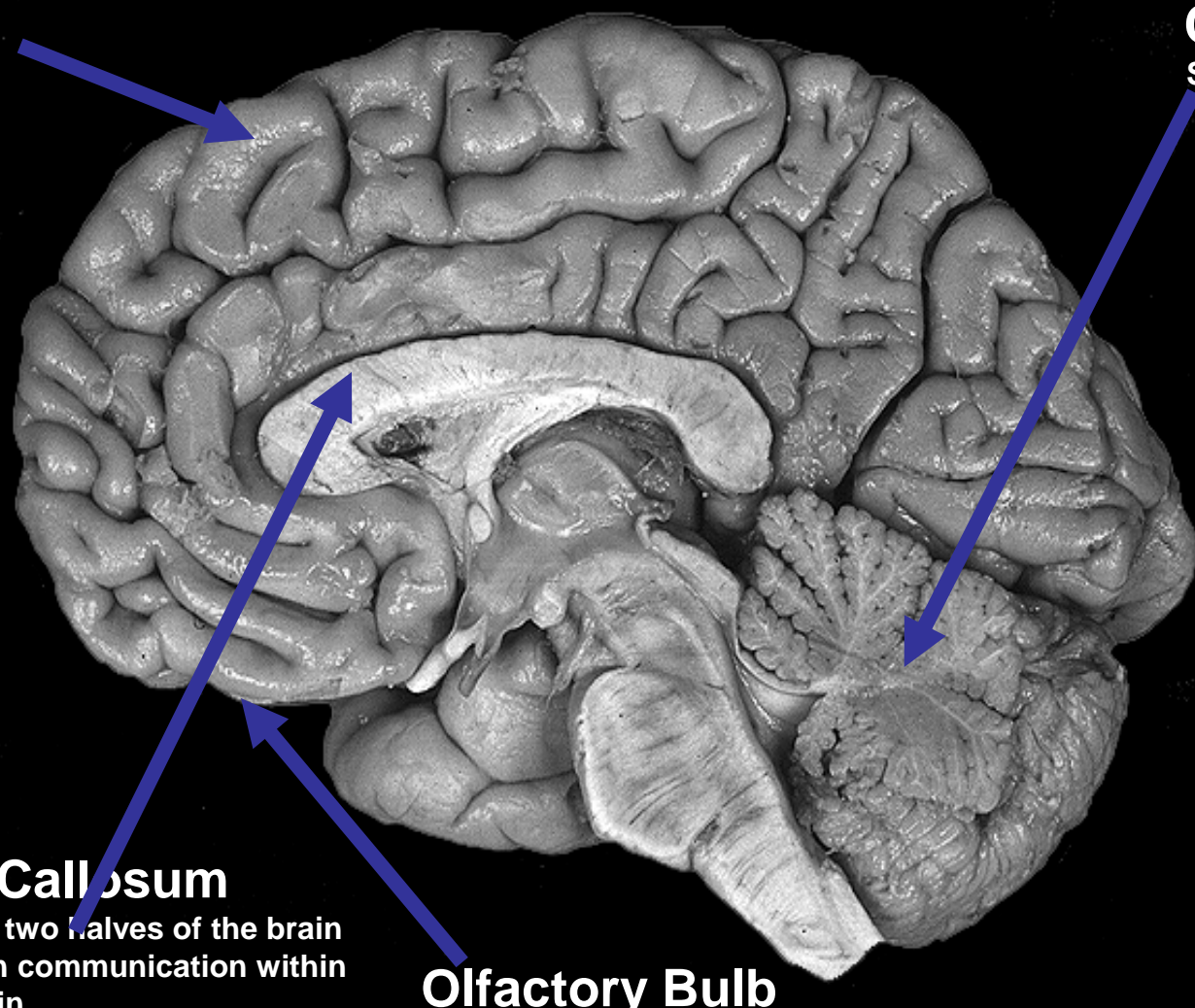
**Central Nervous System Dysfunction
Organic Brain Damage**

- Hyperactivity, attentional deficits
- Intellectual deficits, learning disorders
- Problems with memory, language & judgment
- Developmental delay, microcephaly
- Fine & gross motor problems, seizure disorder
- Mental retardation, structural brain damage

Regions of the Brain Affected by Prenatal Alcohol

Cerebral Cortex

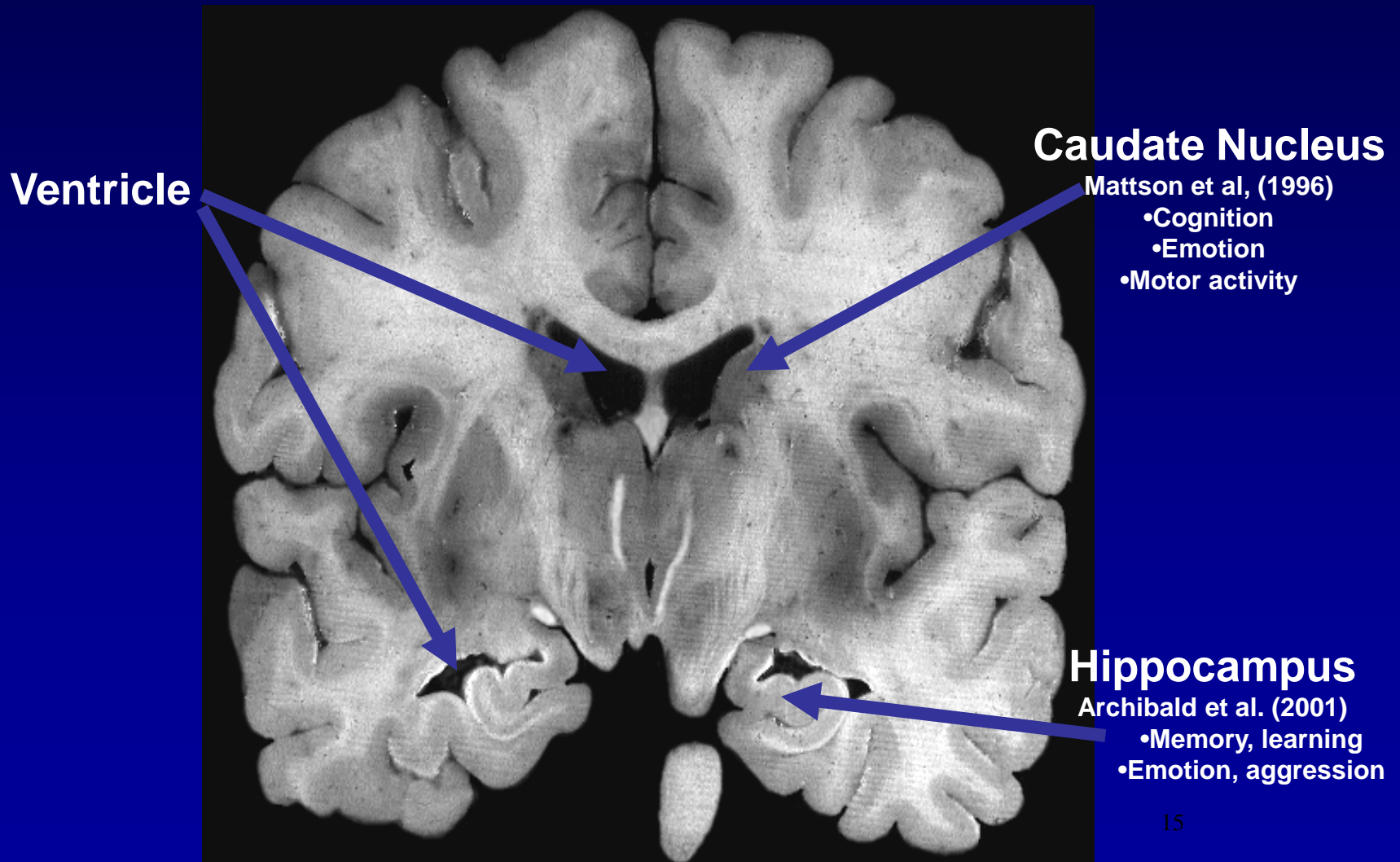
Cerebellum
Sowell et al, (1996)



Corpus Callosum
Connects the two halves of the brain
Plays a role in communication within the brain

Olfactory Bulb

Regions of the Brain Affected by Prenatal Alcohol



Teratogenic Effects of Alcohol on the Brain

A 2011 review of MRI studies found:

- Teratogenic effects of alcohol are widespread, affecting almost the entire brain. Most common MRI findings: reduced brain volume, malformations of corpus callosum.
- Shape, thickness and displacement changes are seen throughout multiple brain regions; *high variability*.
- New studies link cognition to underlying brain structure.
- Several studies report patterns in severity of brain damage as it relates to facial dysmorphology or to extent of alcohol exposure.

Behavioral Phenotype of FAS/D: Poor Executive Functioning

- Difficulty organizing stored information to plan future activities
- Difficulty regulating and sequencing behavior
- Difficulty inhibiting responses and delaying gratification
- Lack of cognitive flexibility
- Poor judgment

Connor, Sampson, Bookstein, Barr & Streissguth 2000,
Developmental Neuropsychology, 18(3), 331-354

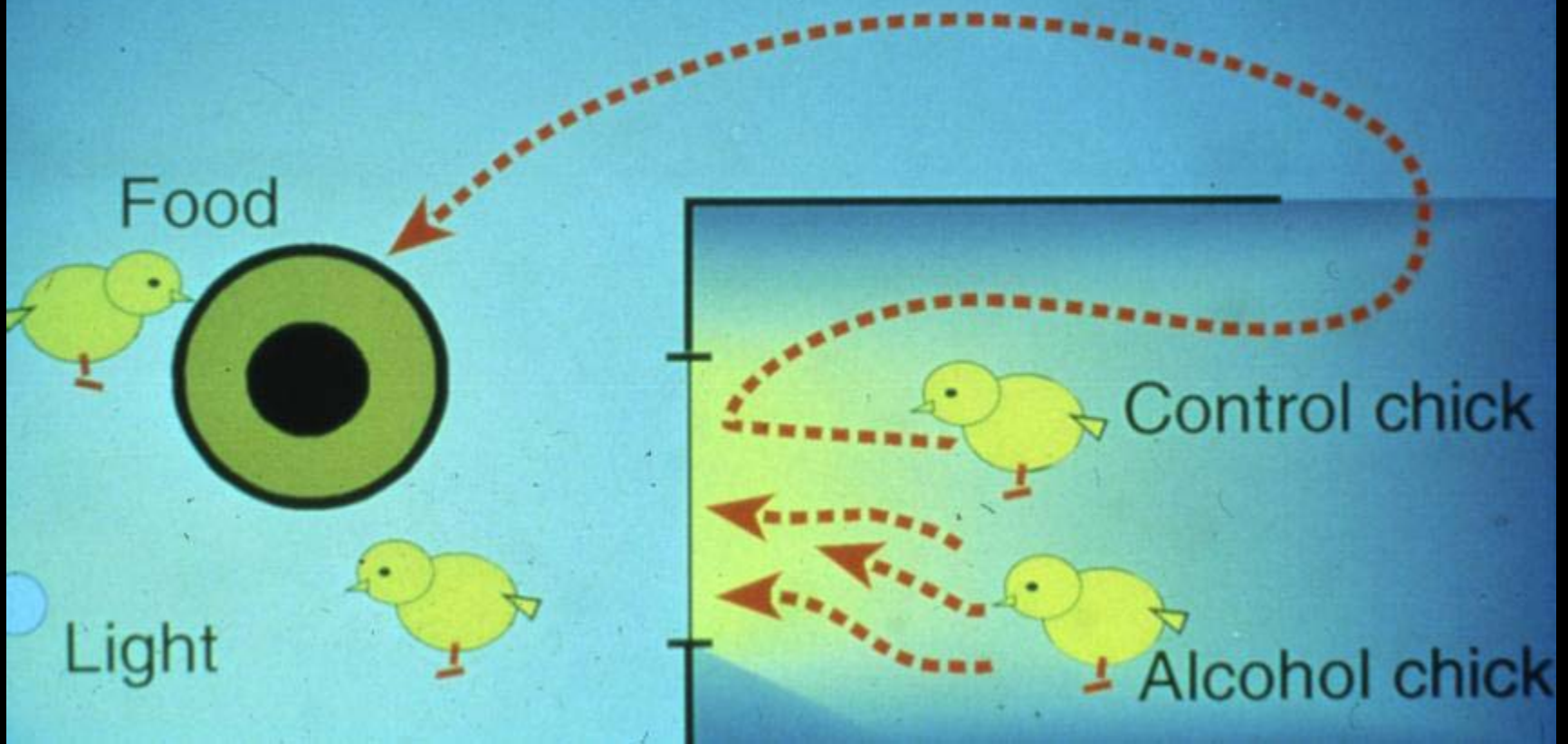
Behavioral Phenotype of FAS/D: Poor Habituation; Difficulty Modulating Incoming Stimuli

- Gets overstimulated in social situation (a crowded room, or among strangers)
- Overreacts to situations with surprisingly strong emotions
- Displays rapid mood swings set off by seemingly small events
- Has poor attention span
- Has trouble completing tasks

FASD: Clinical Implications

- Poor judgment Easily victimized
- Attention deficits Unfocused / distractible
- Arithmetic disability Can't handle money
- Memory problems Doesn't learn from experience
- Difficulty abstracting Doesn't understand consequences
- Disoriented in Fails to perceive social time and space cues
- Poor frustration tolerance Quick to anger

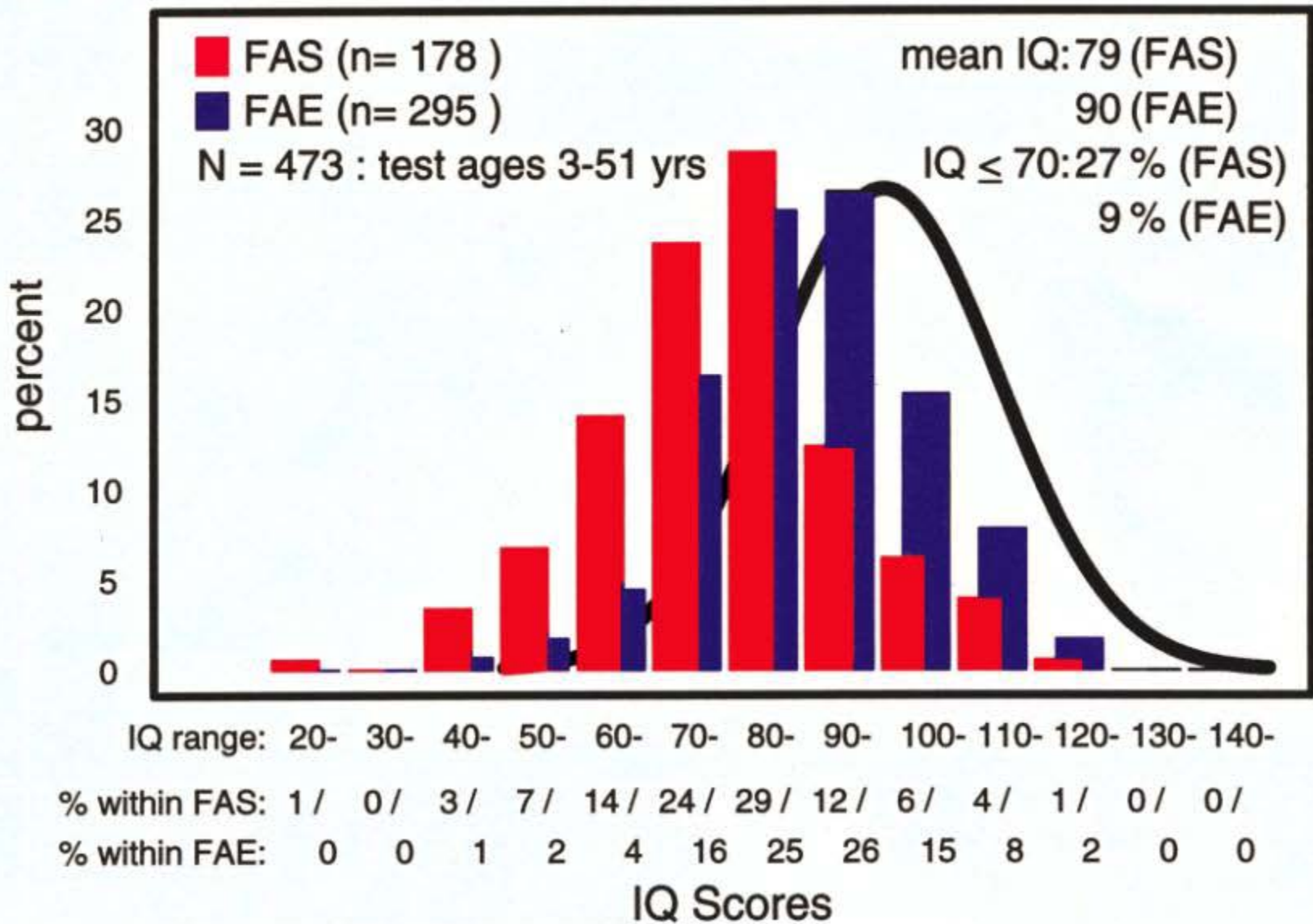
Alcohol Chicks Fail Detour Learning Test



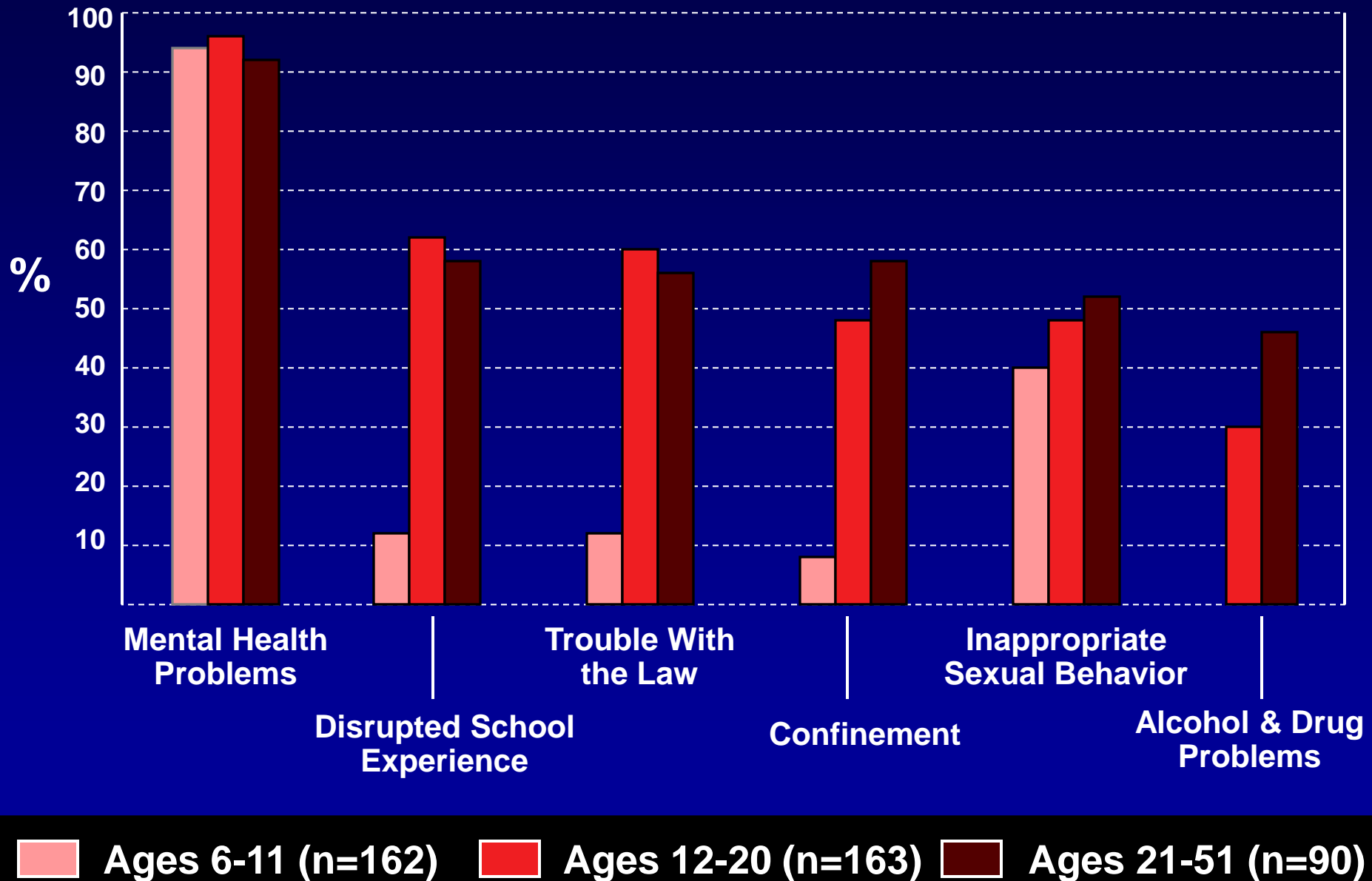
Means, Burnette & Pennington. 1988, Alcohol
Means, McDaniel & Pennington. 1989, Alcohol

Long-term Consequences & Adverse Life Outcomes in Patients with FAS/FASD

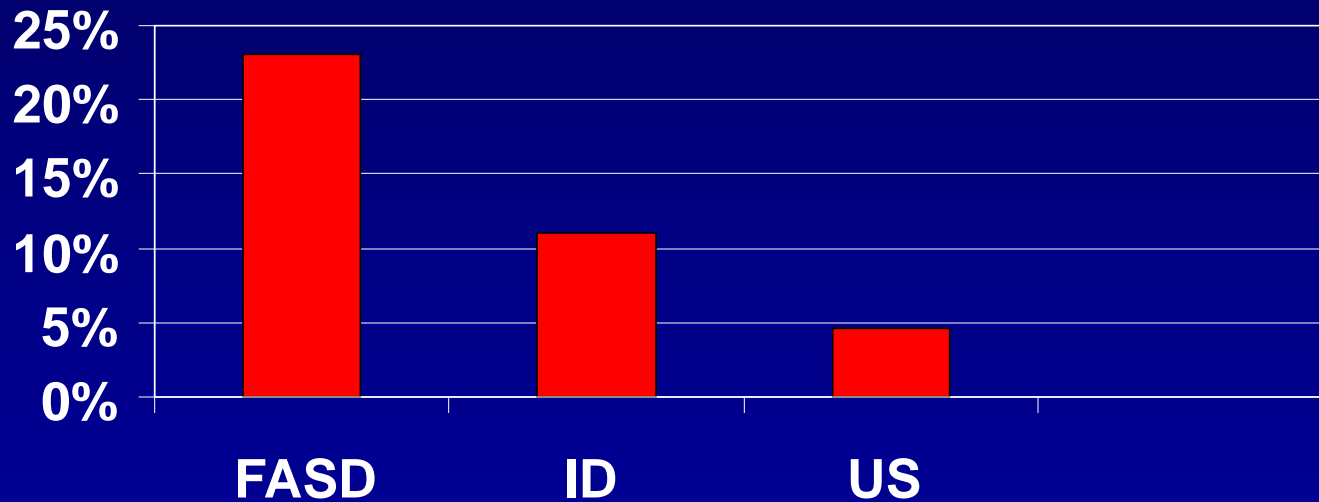
IQ distributions in the Primary Disabilities Sample: FAS and FAE



PREVALENCE OF SECONDARY DISABILITIES by 3 Age Groups



Adult Suicide Attempts: FASD vs. Intellectual Disabilities vs. U.S. population



¹Streissguth, Barr, Kogan & Bookstein, 1996. Understanding the Occurrence of Secondary Disabilities in Clients with FAS & FAE. Final Report to the CDC, p. 35. ²Attempt rate for adults with an Intellectual Disability in mixed clinical & community samples (Hardan and Sahl, 1999; Lunsky, 2004). ³U.S lifetime rate of suicide attempts (1990-1992 National Comorbidity Study; Kessler, Borges, and Walters, 1999).

Facts About FAS and FASDs

Prevalence of FAS and FASD

United States

- FAS: 1.0 to 3.0 per 1000 live births (depends on ascertainment methods)
- FASD: 9.1 per 1000 live births
Annually 40,000 infants born with FASD (more common than Muscular Dystrophy, Cystic Fibrosis, Downs Syndrome and Spina Bifida combined).

U.S. Child Psychiatry population

FASD: 5 per 100

U.S. Juvenile Justice population

FASD: 23 per 100

Facts About FAS and FASDs

- The sole cause of FASDs is fetal exposure to alcohol during the pregnancy. FASDs are not caused by the biological father's alcohol use.
- Dose/response: the more alcohol consumed and the more frequent the exposure, the higher the risk of damage.

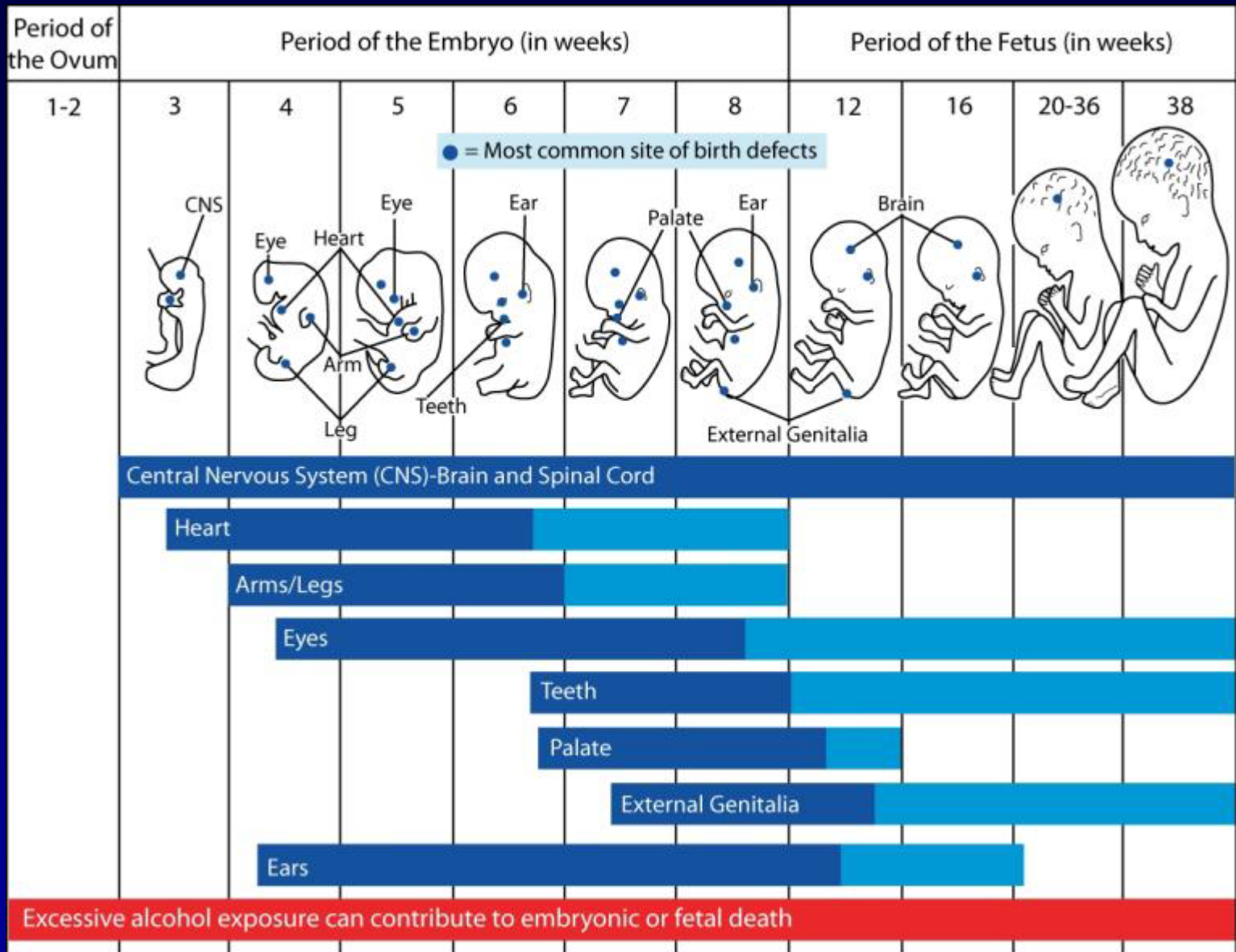


Figure 1 Vulnerability of the fetus to defects during different periods of development. The blue portion of the bars represents the most sensitive periods of development, during which alcohol-induced (i.e., teratogenic) effects on the sites listed would result in major structural abnormalities in the child. The light blue portion of the bars represents periods of development during which physiological defects and minor structural abnormalities would occur. SOURCE: Adapted from Moore and Persaud 1993.

**“Of all the substances of abuse
(including cocaine, heroin, and marijuana),
*alcohol produces by far the most serious
neurobehavioral effects in the fetus.*”**

- *Institute of Medicine Report to U.S. Congress, 1996*

Facts About FAS and FASDs

- No safe level of pregnancy drinking has been established.
- Adverse effects are most likely to occur in offspring of pregnant women who are chronic or binge drinkers (4 or more drinks on an occasion).
- Not every woman who drinks during pregnancy will have a child with FASD.

The Science vs. the Public Health Message

The Science (complicated):

- There is no known safe amount of alcohol but also no clear evidence that small amounts of alcohol have caused damage.

The Public Health Message (simple):

- To have the *healthiest baby possible*, abstain from alcohol when trying to get pregnant and during pregnancy.

Problems! Medical providers...

May be reluctant to ask women about alcohol use
...because they assume their patients are not problem drinkers, or because they aren't trained in treating addictions.

Or...

They may misunderstand research findings and believe media hype...

e.g., Kelly et al., 2010 report that children who had “light-moderate” prenatal alcohol exposure do better than non-exposed children. *This study had major methodologic flaws!*







If I'm Pregnant, Can I ...

.....have a beer?

**Some doctors feel limited drinking –
no more than a pint a day, suggests
Dr. Gibb – after the first trimester is
okay.**



What's A Standard Drink?

<p>12 oz. of beer or cooler</p>	<p>8–9 oz. of malt liquor 8.5 oz. shown in a 12-oz. glass that, if full, would hold about 1.5 standard drinks of malt liquor</p>	<p>5 oz. of table wine</p>	<p>3–4 oz. of fortified wine (such as sherry or port) 3.5 oz. shown</p>	<p>2–3 oz. of cordial, liqueur, or aperitif 2.5 oz. shown</p>	<p>1.5 oz. of brandy (a single jigger)</p>	<p>1.5 oz. of spirits (a single jigger of 80-proof gin, vodka, whiskey, etc.) Shown straight and in a highball glass with ice to show the level before adding a mixer*</p>
						
<p>~5% alcohol</p>	<p>~7% alcohol</p>	<p>~12% alcohol</p>	<p>~17% alcohol</p>	<p>~24% alcohol</p>	<p>~40% alcohol</p>	<p>~40% alcohol</p>
<p>12 oz.</p>	<p>8.5 oz.</p>	<p>5 oz.</p>	<p>3.5 oz.</p>	<p>2.5 oz.</p>	<p>1.5 oz.</p>	<p>1.5 oz.</p>

The problem with “just one drink...”

Research shows frequent drinkers and the majority of women report drinking

larger-than-standard drinks:

- Daily drinkers consume drinks from 3 to 6 times the size of a standard drink.
- Most drinkers underestimate the number of fluid ounces they consume by about 30%.

FAS and FASD are
100% preventable.

There is no cure
for FAS and FASD.

Major public health aim?
Prevention

Institute of Medicine

Public Health Prevention Approach

Three levels of FASD prevention activities:

Universal

Promotes general knowledge about pregnancy alcohol use, e.g. warning signs, public health messages, bottle labels.

Selective

Involves screening women for alcohol use, training health care professionals, brief interventions and referrals.

Indicated

Focuses on those at highest risk for adverse outcomes: pregnant women who are heavy drinkers, and women who have given birth to a child with FASD.

Institute of Medicine
Universal Prevention Strategies

February 21, 2005
U.S. Surgeon General
Advisory on Alcohol Use in Pregnancy

Women who are pregnant or who may become pregnant should abstain from alcohol consumption in order to eliminate the chance of giving birth to a baby with any of the harmful effects of the Fetal Alcohol Spectrum Disorders (FASD).

This updates 1981 Surgeon General's Advisory.⁴

When you're Pregnant...

the best drink is no drink at all.

Play it safe. Avoid beer, wine, and liquor during your pregnancy.

DIAL 5-HEALTH for information—that's 543-2584.

Pregnancy and Health Program  University of Washington

Institute of Medicine Indicated Prevention Strategies

Example: *WA State Parent-Child Assistance Program (PCAP)*, an intensive case management/home visitation intervention for high-risk pregnant/parenting mothers who abuse alcohol/drugs during pregnancy.

- **Developed in 1991 at UW; now serving 730 families in 9 WA counties.**
- **Evidence-based/ positive outcomes**
- **Cost effective**
- **Widely replicated in the U.S. and Canada**

Institute of Medicine

Selective Prevention Strategies

**Screening women for alcohol use
is the first step.**

***Everyone needs to
ask the question.***

Poll Question

Do you work in a setting where you have an opportunity to ask women about their alcohol use?

Yes

No

Poll Question

Are you comfortable asking women about their alcohol use?

Yes

No

Brief alcohol screening instruments to help health care providers identify problem drinkers

For non-pregnant women

**The AUDIT, TWEAK, and CAGE are useful
(as long as you use lower cut points than those
used for men)**

For pregnant women: *use at 1st prenatal visit*

The T-ACE is better

Note: These four instruments screen *only for alcohol problems*, not drug use.

For pregnant women

Chasnoff's 4 Ps: a good, short tool. For women who screen positive, it should be followed by a structured clinical interview.

The 4P's Plus©

Parents

Did either of your parents ever have a problem with alcohol or drugs?

Partner

- Does your partner have a problem with alcohol or drugs?

Past

- Have you ever drunk beer, wine, or liquor?

Pregnancy

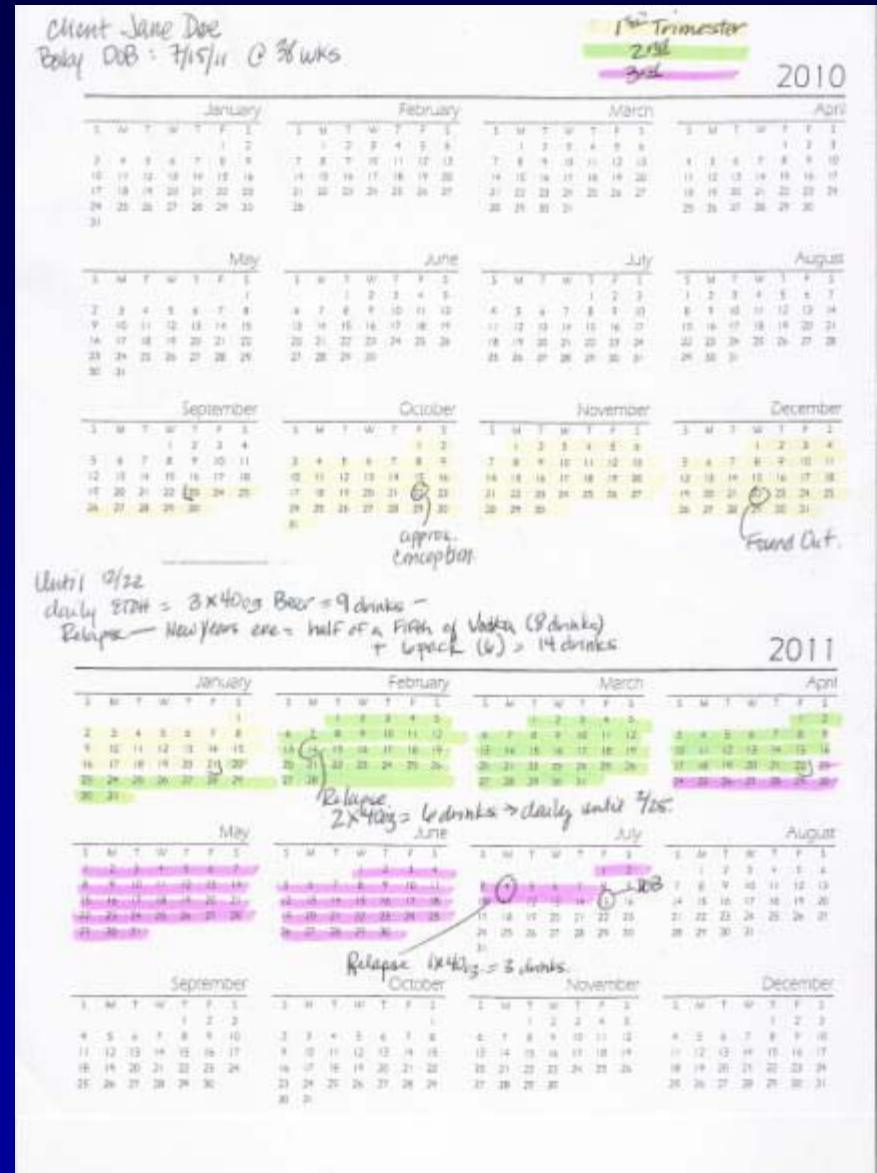
- In the month before you knew you were pregnant, how many cigarettes did you smoke?
- In the month before you knew you were pregnant, how many beers/how much wine/how much liquor did you drink?
- In the month before you knew you were pregnant, how much marijuana did you smoke?

Detailed follow-up for pregnant
problem drinkers...

We use a calendar and ask:

- Before you got pregnant, how often were you drinking?
- What were you drinking ?
- How much would you usually drink ?
- When did you find out you were pregnant?
- When you found out, did your drinking change?
- Did you relapse or slip before the baby was born?

Now you can discuss concerns you may have for the long term health and development of the child. Be supportive and non-judgmental.



Alcohol Use During Pregnancy in Washington State

Western WA 1989-2004 N =12,653

	PRIOR TO PREGNANCY		DURING PREGNANCY	
	<u>Any Alcohol</u>	<u>Binge Alcohol</u>	<u>Any Alcohol</u>	<u>Binge Alcohol</u>
STUDY 1 1989-1991	45%	9%	30%	3%
STUDY 2 1991-1992	41%	10%	23%	4%
STUDY 3 2002-2004	43%	14%	12%	1%

Pregnancy Risk Assessment Monitoring System (PRAMS)

Washington State Data

	3 months prior to pregnancy		Last trimester of pregnancy	
	<u>Any Alcohol</u>	<u>Binge Alcohol</u>	<u>Any Alcohol</u>	<u>Binge Alcohol</u>
1994	57.3%			
2001-2003	49.0%	13 %	6 %	<1.0 %
2008	55.0%	19%	10 %	<1.0%

***What Is Your Role
In Preventing FASD?***

- **Motivate women to stop drinking before and during pregnancy**

– or –

- **Help women who can't stop drinking to avoid becoming pregnant**

What Advice Do You Give Women?

- Women who drink heavily and are not pregnant should be counseled about contraceptive options, and about risks of drinking at conception and during pregnancy.
Half of all pregnancies in the U.S. are unintended!
- Women who drink heavily and are pregnant should be counseled to stop drinking. If they can't stop they should be offered help to reduce alcohol intake.

True or False?

- Most people with FASD are mentally retarded.
- FAS is more severe than FASD.
- People grow out of FASD.
- People with FASD can't learn from mistakes.
- FASD means infants are born drunk.
- People with FASD can't be treated.

Resources

- SAMHSA FASD Center for Excellence:
www.fasdcenter.samhsa.gov/
- Centers for Disease Control and Prevention FAS
Prevention Team: www.cdc.gov/ncbddd/fasd/
- National Institute on Alcohol Abuse and Alcoholism
(NIAAA): www.niaaa.nih.gov/
- National Organization on Fetal Alcohol Syndrome
(NOFAS): www.nofas.org/
- UW Fetal Alcohol Syndrome Diagnostic and Prevention
Network (FASDPN):
<http://depts.washington.edu/fasdpn/>

Maternal and Child Public Health Leadership Training Program University of Washington, Seattle



Past training sessions can be viewed at

<http://www.nwcphp.org/training/courses/maternal-child-health-mch-training-for-professionals>

The *Northwest Bulletin*, a newsletter focused on issues affecting the health of children and families living in the Northwest Region and Alaska, is available at <http://depts.washington.edu/nwbfch/>

Supported in part with grant #T76 MC 00011 from the Maternal and Child Health Bureau (Title V, Social Security Act).