Anticipated Outcomes

- Define the cause and potential outcome of prenatal exposure
- Familiar with common terminology
- Familiar with diagnostic features of FASD
- Identify continuum of effects
- Identify intervention strategies
Content Outline

- Brief Introduction to FASD
- Continuum of Effects
- Intervention
- Activity
Brief Introduction to FASD
Brief Introduction to FASD

Why is alcohol so bad?

- Alcohol is a teratogen

“Any agent that can disturb the development of an embryo or fetus. Teratogens may cause birth defects in the child.”

Taken from: Webster’s New World Medical Dictionary
Brief Introduction to FASD

“Alcohol represents the largest environmental cause of behavioral teratogenesis yet discovered and, perhaps, the largest single environmental cause that will ever be discovered.”

Taken from: Handbook of Behavioral Teratology
Brief Introduction to FASD

Possible Outcomes of Prenatal Alcohol Exposure

- Fetal Death
- Birth Defects
- Impaired Growth
- Impaired Central Nervous System (CNS) Structure/Function
- Neurobehavioral Problems
- Fetal Alcohol Spectrum Disorder
Brief Introduction to FASD
Fetal alcohol spectrum disorder (FASD) is an umbrella term used to describe the range of effects that can occur when a mother drinks alcohol during pregnancy. These effects can be physical, mental, learning and/or behavioral with possible lifelong implications.

FASD is not a diagnostic term used by clinicians.
Brief Introduction to FASD

Terminology

- Fetal Alcohol Syndrome (FAS)
- Partial Fetal Alcohol Syndrome (pFAS)
- Alcohol-Related Neurodevelopmental Disorder (ARND)
Diagnostic Process

- 4 – digit code (University of Washington)
- CDC (Center for Disease Control) method
- Modified Institute of Medicine method
- Combination method (MN approach)
+ Brief Introduction to FASD

Taken from, A Small Dose of Toxicology, 2nd Ed., by Steven Gilbert. Updated 01/30/2012 at http://www.toxipedia.org/display/hwt/A+Small+Dose+of+Toxicology%2C+2nd+Edition.
Brief Introduction to FASD

Diagnostic Features

- Growth deficiency
- CNS structural-functional abnormality
- Prenatal alcohol exposure (confirmed/unconfirmed)
Small head
Epicanthal folds
Flat midface
Smooth philtrum
Low nasal bridge
Small eye openings
Short nose
Thin upper lip
Underdeveloped jaw
Brief Introduction to FASD

<table>
<thead>
<tr>
<th>Week</th>
<th>Events</th>
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<tbody>
<tr>
<td>1-2</td>
<td>Dividing zygote, implantation, and gastrulation</td>
</tr>
<tr>
<td>3</td>
<td>CNS</td>
</tr>
<tr>
<td>4</td>
<td>Eye, heart</td>
</tr>
<tr>
<td>5</td>
<td>Common site of action of teratogen</td>
</tr>
<tr>
<td>6</td>
<td>Ear, palate</td>
</tr>
<tr>
<td>7</td>
<td>Ear, teeth</td>
</tr>
<tr>
<td>8</td>
<td>external genitalia</td>
</tr>
<tr>
<td>9</td>
<td>Brain</td>
</tr>
<tr>
<td>16</td>
<td>20-36</td>
</tr>
<tr>
<td>38</td>
<td>Prenatal death</td>
</tr>
</tbody>
</table>

**Major Morphological Abnormalities:**
- CNS
- Heart
- Upper limbs
- Eyes
- Lower limbs
- Teeth
- Palate
- External genitalia
- Ear

**Functional Defects and Minor Morphological Abnormalities:**
Brief Introduction to FASD

Scope of the Problem

FIGURE. Prevalence* of binge† drinking among childbearing-aged women (18–44 years), by state — United States, 2002

* Estimated prevalence population weighted to represent U.S. women aged 18–44 years (U.S. average: 12.4%; state range: 5.4%–21.6%).
† Five or more drinks on any one occasion.
Brief Introduction to FASD

Facts about FASD

- Prenatal alcohol exposure is the leading cause of birth defects and developmental disabilities in the US

- Approximately 1 in 100 children born each year in the US have been prenatally exposed to alcohol

- FASD is 100% preventable
Continuum of Effects & Intervention
Child's Brain Unexposed to Alcohol

Smaller head size

Child's Brain after Prenatal Exposure to Alcohol

Fewer folds in brain

Flattened face

Smother surface of brain

Underdeveloped inner structure of brain

Source: Children's Research Triangle, Chicago, IL
Continuum of Effects

- Physical Challenges
- Verbal Learning
- Visual-Spatial Learning
- Reaction Time
- Attention Problems
- Social Problems
- Emotional Problems
- Executive Functioning
- Sensory Integration
- Secondary Disabilities
Continuum of Effects

Physical Challenges

- Physical Challenges associated with FASD include CNS impairment, short stature, smaller head circumference, and physical deformities.

- Physical challenges include:
  - Microcephaly
  - Motor skills (fine/gross)
  - Sensory challenges
  - Motor planning
  - Susceptible to infections (ear/nose)
  - Organ damage
Verbal Learning is a style of learning that allows an individual to respond verbally to a verbal stimulus cue.

Challenges with Verbal Learning include:
- Problems with language memory
- Difficulty pairing words with their correct meanings
- Limited vocabulary
- Difficulty following written instructions or story problems

Example

Children prenatally exposed to alcohol exhibit a variety of problems with language and memory. For example, Mattson and colleagues found that children with FAS ages 5 to 16 learned fewer words compared with a group of children of comparable mental age who did not have FAS.
**Visual-Spatial Learning**

- Visual-Spatial Learning is pertaining to the perception of the spatial relationships between objects in one’s field of vision.

**Challenges with Visual-Spatial Learning include:**

- Difficulty restoring objects to their correct place
- Poor sense of direction
- Difficulty reading and interpreting maps
- Poor color balance
- Poor spatial intelligence

**Example**

- Children with FASD perform poorly on tasks that involve learning spatial relationships among objects. In one experiment, groups of children with and without FAS were equal in their ability to recall common, small household and schoolroom objects (e.g., a paper clip or spoon) that had been placed within sight on a table and then removed. However, children with FAS had greater difficulty subsequently restoring the objects to their original positions on the table.
### Reaction Time

- Reaction Time refers to how quickly the brain processes information.

- Challenges with Reaction Time include:
  - Slower processing of information
  - Difficulty maintaining focus
  - Slower motor reflexes
  - Difficulty multi-tasking

### Example

- Prenatal alcohol exposure has been associated with slower, less efficient information processing in school-age children.
Continuum of Effects

Attention Problems

- Attention Problems include the mental faculty of concentration, careful observation or listening.

- Challenges with Attention include:
  - Difficulty focusing or sustaining attention over time
  - Easily distracted by irrelevant stimuli
  - Procrastination
  - Disorganized work habits
  - Impulse control problems
  - Reciprocal speech challenges
  - Fidgeting, squirming when seated
  - Having difficulty playing quietly or engaging in quiet activities
  - Often talking excessively

- Attention problems have been considered a hallmark of prenatal alcohol exposure. Coles and colleagues found that children with ADHD exhibited difficulty focusing and sustaining attention over time. In contrast, children who were exposed to alcohol prenatally were able to focus and maintain attention, but displayed difficulty in *shifting* attention from one task to another (i.e., set shifting).
Continuum of Effects

Social Problems

- Social Problems includes (broadly) disorganized or absent awareness of social norms, social cues, facial expressions, empathy, communication, and non-verbal expressions.

- Challenges with Social Problems include:
  - Difficulty interacting with other peers or adults
  - Difficulty communicating needs / expression
  - Inappropriate boundaries or behaviors
  - Lack of empathy
  - Difficulty understanding social “norms” or “cues” in a situation
  - Difficulty playing or interacting with others
  - Social isolation
  - Bullying or victim of bullying
Continuum of Effects

Emotional Problems

- Internal and external Emotional Problems may manifest as depression, aggression, irritability, or behavioral problems.

- Challenges with Emotional Problems include:
  - Difficulty building or maintaining positive interpersonal relationships
  - A general pervasive mood of unhappiness or depression
  - Inappropriate types of behavior or feelings under normal circumstances
  - Emotional reactivity – disproportionate to circumstance
  - Separation anxiety
  - Tantrums, fighting, bullying, cursing and other forms of violence
Continuum of Effects

Executive Functioning

- Executive Functioning is an umbrella term for cognitive processes in the brain.

- Challenges to Executive Functioning include:
  - Inhibition
  - Difficulty planning or sequencing
  - Concrete thinking; cannot abstract (time, money)
  - Cannot self-monitor
  - Poor judgment

Example

- Children prenatally exposed to alcohol respond poorly when asked to switch from naming animals to naming types of furniture, and then back to naming animals.

- They also have difficulty abandoning demonstrably ineffective strategies when approaching problem-solving tasks, a type of behavioral inflexibility referred to as perseverance.

- Perseveration and impaired set shifting are consistent with distractibility and impulsivity, factors that at least theoretically might contribute to attention and learning problems.
Continuum of Effects

- Sensory Integration Problems
  - Sight
  - Smell
  - Hearing
  - Touch
  - Taste
  - Vestibular
  - Proprioception
Continuum of Effects

- Secondary Disabilities
  - Mood Disorder
  - Anxiety Disorder
  - Attention Deficit/Hyperactivity Disorder
  - Substance Abuse Disorder
  - Suicidal Ideation
### Developmental Traits

#### Infancy
- Disrupted sleep/wake cycles
- Poor sucking reflex/feeding challenges
- Involuntary motor movement/thrashing
- Physical problems: small stature, underdeveloped organs (heart, lungs, kidney)
- Microcephaly
- Aversion to textures, touch, taste or smell
- Sensitivity to loud noises or light

#### Toddler
- Hyperactive
- High tolerance to pain
- No “stranger danger”
- Difficulty regulating emotions
- Tantrums x 100
- May bite, push, punch other children
- Difficulty socializing
- Aversion to certain textures, tastes, sounds or smells
- Language difficulties
- Fine/Gross Motor difficulties
- Toileting difficulties
# Developmental Traits

<table>
<thead>
<tr>
<th>Youth</th>
<th>Adolescent/Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperactive</td>
<td>Mental health issues</td>
</tr>
<tr>
<td>Secondary Disabilities</td>
<td>Substance abuse issues</td>
</tr>
<tr>
<td>Speech/Language delays</td>
<td>Victim of bullying</td>
</tr>
<tr>
<td>Learning disabilities</td>
<td>Overly sexualized behavior</td>
</tr>
<tr>
<td>Impulse control challenges</td>
<td>Criminality</td>
</tr>
<tr>
<td>Poor social skills / behaviors</td>
<td>Disrupted school experience</td>
</tr>
<tr>
<td>Poor hygiene</td>
<td></td>
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<tr>
<td>Problems with transitions</td>
<td></td>
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<tr>
<td>Inappropriate sexual behaviors/ boundaries</td>
<td></td>
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<tr>
<td>Difficulty with cause-effect relationships</td>
<td></td>
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<tr>
<td>Difficulty sequencing / following instructions</td>
<td></td>
</tr>
<tr>
<td>Will lie or say what people want to hear</td>
<td>Possible aggressive behaviors</td>
</tr>
</tbody>
</table>
Adverse Life Outcomes

- Inappropriate sexual behavior
- Homelessness
- Unemployment/Underemployed
- Disrupted school experience
- Trouble with the law
- Poor Adaptive Skills
- Confinement
- Mental health problems
- Alcohol and drug problems
- Difficulty with Relationships
Intervention
Intervention Team

- Natural Supports
- Pediatrician, Family Doctor P.A., or Pediatric Nurse Practitioner
- Developmental or Behavioral Specialist
- Child Psychologist or Developmental Psychologist
- School Nurse
- Social Worker
- Registered Dietician
- Occupational Therapist
- Ophthalmologist or Optometrist
- Otolaryngologist
- Speech and Language Pathologist
- Audiologist
- Classroom Teacher(s)
Intervention

- Protective Factors
- Early Diagnosis
- Accommodations
- Anticipatory Guidance/Prevention
- Community-Based
- Educational / Assessment
- Family Support Resources
- Medical
- Mental Health
- Developmental Therapy
- Safety
- Social Service / Child Welfare
- Alternative Approaches
Intervention

Protective Factors

- Involvement in Special Education and Social Services
- Loving, Nurturing and Stable Home Environment
- Absence of Violence
- Being diagnosed with FAS rather than an alcohol-related disorder
  - Those who are diagnosed with FAS have facial features that can alert professionals of the possibility of prenatal exposure to alcohol, and thus, initiate services earlier.

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

- A child who is diagnosed at a young age can be placed in appropriate educational classes and get the social services needed to help his/her family.

- Early diagnosis also helps families and school staff to understand why the child might act or react differently from other children.

Early Diagnosis

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities

Continuum of Effects
Intervention

Accommodations

- Specific adaptation or modification to environment/routine to be implemented at home, school, or other setting.
  - Behavior/emotional regulation (supports for group participation, enhancing environmental structure)
  - Communication (visual schedules, cues for social interaction)
  - Executive function, organization, memory (memory aids, checklists)
  - Sensory-motor (headphones, reducing sensory input, keyboarding)

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

Anticipatory Guidance/Prevention

- Prevention oriented recommendations based on developmental risk factors for future problems
  - Substance abuse prevention
  - Learning problems/behavior risks (awareness of potential for school/learning difficulties and/or mental health problems)
  - Reproductive health (pregnancy and STD prevention)

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

- Leisure or recreation recommendations for specific, community-based activities/programs that are prosocial, recreational, extracurricular in nature and include appropriate developmental and social supports.
- Prosocial extracurricular/play activates (Boys and Girls Club; community social skills groups)
- Physical/movement (noncompetitive sports; horseback riding; Special Olympics)
- Special interest groups (focused leisure, religious, or cultural activities)
- Adult mentorship (Big Brother, Big Sister)

Community-Based

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

- Referral, advocacy, or support for a specific educational program or service, psychoeducational assessment, or specific skill area that requires educational monitoring.
  - Referral/support for educational service (special education, life skills training, birth-3 program)
  - Monitor a specific area of performance (fine motor, language)
  - Psychoeducational-neuropsychological assessment to determine special education eligibility, re-examine individual education to plan or advocate for continued eligibility

Education/Assessment

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

Family Support Resources

- Referral/recommendations for educational materials (books, Websites) community support groups, advocacy training, or caregiver education or support.
  - Books, web-based resources (attachment, sleep, FASD)
  - Personal / peer support (NOFAS, grandparent support group)
  - Advocacy / education (parent advocacy group, parent education, community training)
  - Respite / self-care for caregiver

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
## Intervention

### Medical

- Recommendations/referral to medical specialist or current provider for evaluation or follow-up care regarding a specific medical problem or issue.
  - Psychiatric services and/or medication management / consultation
  - ADHD evaluation
  - Sleep evaluation
  - Vision/Hearing evaluation
  - Growth
  - Neurological evaluation / consultation

### Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

Mental Health

- Support/referral for mental health services to address individual and/or family needs around behavior, development, or mental health problem(s).
- Behavioral consultation or specialist (behavior management, home-based intervention services)
- Individual counseling
- Family counseling
- Case management

Continuum of Effects

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
**Intervention**

- Referral / recommendation for occupational therapy, physical therapy, speech-language therapy, or specific therapeutic program.
- Referral / recommendation for occupational, physical, or speech language therapy evaluation or treatment
- Referral to a therapeutic social skills group

**Developmental Therapy**

**Continuum of Effects**
- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

**Safety**

- Recommendations / resources to address home, school, or community safety concerns.
  - Personal ID/Safety (ID bracelet, wallet card)
  - Environmental modification / supervision (alarms, line-of-sight supervision)

**Continuum of Effects**

- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
## Intervention

### Social Service/Child Welfare
- Resources/support for children in out of home placements, including caregiver support and funding resources.
- Placement advocacy (stable, safe, structured, supportive home environment; movement towards long-term permanency)
- Caregiver resources to support appropriate placements and long-term needs (adoption support, supplemental security income eligibility, family support program)

### Continuum of Effects
- Physical
- Verbal Learning
- Visual-Spatial
- Reaction Time
- Attention
- Social
- Emotional
- Executive Functioning
- Sensory
- Secondary Disabilities
Intervention

Alternative Approaches

- Nutritional
- Biofeedback
- Relaxation therapy, visual imagery, and meditation
- Creative art therapy
- Yoga and exercise
- Acupuncture and acupressure
- Massage, Reiki, and energy healing
- Animal-assisted therapy
Intervention

- Concentrate on strengths and talents
- Accept limitations
- Be consistent with everything
- Use concrete language and examples
- Use stable routines that do not change daily
- Be specific
- Structure the child's world
- Use visual aids, music, and hands-on activities
- Use positive reinforcement
- Supervise
- Repeat
- Keep it simple
Activity