



Fetal Alcohol Spectrum Disorders; Learning and Behavioural Problems

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Fetal Alcohol Spectrum Disorders

- FASD includes
 - Fetal Alcohol Syndrome FAS
 - Partial FAS
 - Neurodevelopmental Disorders
 - alcohol related
 - alcohol exposure unknown
 - *Static Encephalopathy, ARND, PAE*

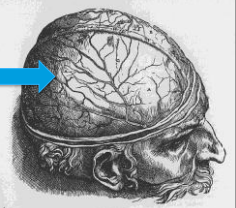


Fetal Alcohol Spectrum Disorders

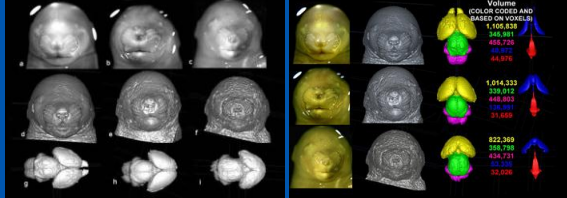


- Fetal Alcohol Syndrome
- Partial Fetal Alcohol Syndrome
- Neuro-developmental disorders

Alcohol is a teratogen - interrupts or alters the normal development of a fetus, including the development of the brain or other major organs



Animal Studies



Volume (CUBIC CM) AND BASED ON VOXELS
1,500,829
345,881
458,722
28,872
44,876
1,044,332
308,912
448,803
208,891
31,669
822,309
258,798
606,721
23,428
32,406

- Dr K Sulik and team, University of North Carolina
- *Limitations of animal studies*

www.med.unc.edu/.../images/01dic22.jpg

How much alcohol?

- We don't know how much alcohol, if any, is safe to drink during pregnancy
- Not all children exposed to alcohol during pregnancy will be affected or affected to the same degree
- The level of risk to the fetus is hard to predict
 - broad range of effects are possible

How much alcohol?

- Timing (gestation) When during the development
- Frequency (throughout pregnancy) How often was there exposure
- Quantity (at each exposure) How much alcohol at each exposure



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

IOM Report to Congress, 1996



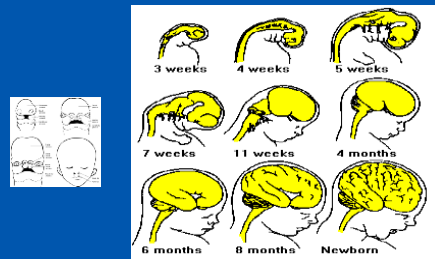
NHMRC Guideline 4:

- Maternal alcohol consumption can harm the developing foetus or breastfeeding baby.
- A. For women who are pregnant or planning a pregnancy, not drinking is the safest option.
- B. For women who are breastfeeding, not drinking is the safest option.

http://www.nhmrc.gov.au/_files_nhmrc/files/publications/summary/dsl-5-alcohol.pdf



Embryology-time frame for the Brain



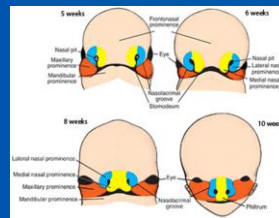
FAS and the Brain

Normal brain of baby 6 wks old Brain of baby same age with FAS

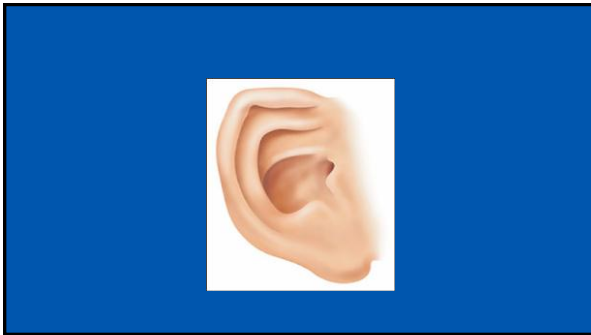
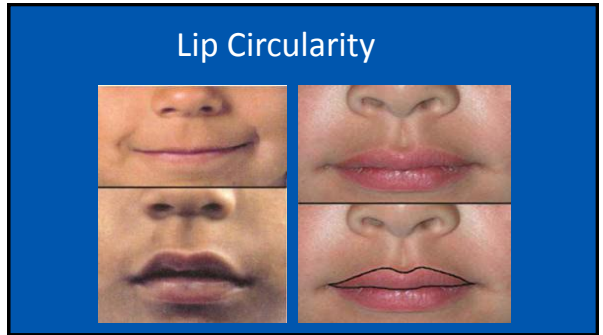
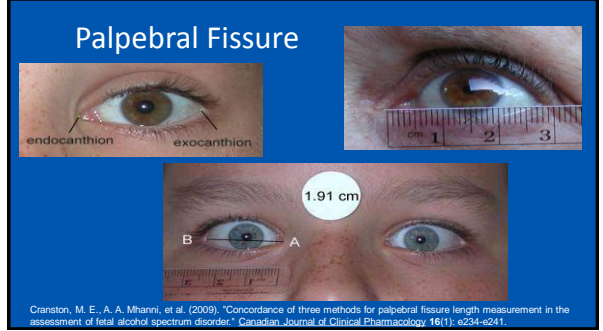
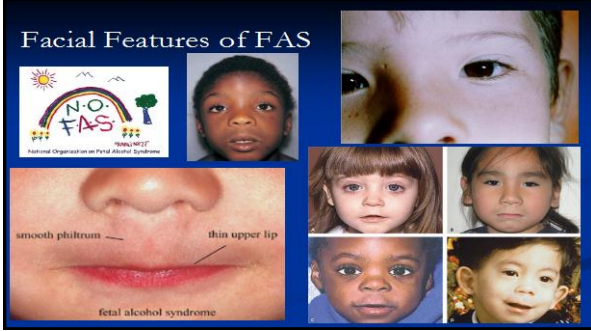


Photo courtesy of Sterling Clarren MD

Clinical Features of Fetal Alcohol Syndrome (FAS)




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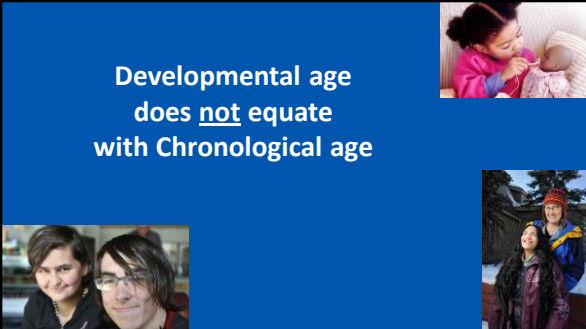
Neurodevelopmental disorders



- Look 'normal'
- Maybe verbal
- May not have a low IQ
- Say they know what to do
- Non-compliant, uncooperative, "bad"
- Poor understanding of time
- Negative self image and lack social skills



Developmental age does not equate with Chronological age




Each year

Alcohol use is responsible for around 450 deaths in Western Australia (WA)

2010: WA residents hospitalised 15,775 times for conditions related to alcohol, costing ~ \$100 million.

2006: alcohol estimated to be responsible for 3.85% of the total attributable burden of disease.

The main reasons for alcohol-related hospitalisations were alcoholism, alcohol-related diseases, falls and assaults.

For young people under the age of 18

The use of alcohol is particularly harmful

- typically consumed at risky levels.
- may also increase the likelihood of other risky behaviours
 - drink driving,
 - physical violence,
 - unsafe sex
 - mental health issues.

Between 2007 and 2011 for youth aged 12 to 17 years in WA

- 2,484 were admitted to hospital for alcohol-related reasons
 - 6,485 bed days were utilised
- 25 alcohol-related deaths.

Australian schools student alcohol and drug survey: alcohol report 2011: Western Australia

Key Findings	AGE						
	12-15			16-17			12-17
2008 vs. 2011	MALE	FEMALE	ALL	MALE	FEMALE	ALL	ALL
NEVER DRANK	28.2 +	28.7 +	28.4 +	10.1	10.6	10.4	23.9 -
DRANK LAST YEAR	46.5 -	42.0 -	44.3 -	80.3	79.7 -	80.0	53.3 -
DRANK LAST MONTH	22.4 -	20.9 -	21.7 -	56.3	50.6 -	53.5 -	29.7 -
DRANK LAST WEEK	11.1 -	13.3 -	12.2 -	36.4	30.7	33.5	17.5 -
OF THOSE WHO DRANK LAST WEEK							
Drank at single occasion	29.3	25.5	27.3	51.3	39.7	45.9	36.2
Mean number of drinks	6.5 +	5.8 +	6.2 +	8.2	5.5	6.9 -	6.5

(+) = SIGNIFICANTLY HIGHER THAN 2008 AT P<0.05; (-) = SIGNIFICANTLY LOWER THAN 2008 AT P=0.05



In-utero exposure

- Almost 50% of pregnancies are unplanned
- "Normal" drinking among a % of the population is at a *binge* level
- Aboriginal women drink less than Non-Aboriginal women
- Asking about alcohol use difficult
 - Stigma
 - Skill
 - resources

Just landed back in Perth from the 5th International Conference on FASD

Part of a whole-of-wall advertisement for Crown Casino, Feb 2013



What about responsible advertising?



Learning Problems

- Learning
- Executive function
- Encoding
- Perceptual reasoning
- Verbal comprehension
- Time
- Abstract
- Recall
- Working memory

Learning: Encoding is flawed

- Encoding is impaired
- Cannot generalise learning
- Not able to complete abstract thought
 - Can't link cause and effect
 - Multiple sequences beyond capacity
 - Impaired recall

Children and youth with a FASD

- Problem with impulsivity - Immediate pleasure
- Abstract thinking, Executive function
 - Cause and effect
 - this action causes that re-action
 - no idea of consequences
- Not remembering, not learning and unable to generalise
- Not understanding why “here” now
- Not competent nor intentional in their errors
 - opportunistic and impulsive

Behavioural Problems

- Impulsivity
- “Stealing”
- Forgetful
- Issues with time
- Sensory seeking behaviours
- Substance use
- Normal behavioural management does not work
 - *Negative consequences do NOT work*

Secondary and Tertiary Disabilities

- Result of the interaction between primary disabilities with adverse environments
- Behavioural and neuropsychological problems
- Fractured placements
- School failure and early engagement with law

Tertiary Disabilities

- Academic failure
- Mental health disorders
- Addiction
- Sexual deviance
- Inability to live independently
- Problems with the justice system
 - Encounters with the law
 - Confinement

Intervention

- Systematic review
 - 2 RCT's for stimulant medication
 - 7 studies of educational interventions
 - 3 studies of social communication & behavioural strategies

Behavioural Intervention

- Inclusion of teachers, parents/carers
 - In the education and training
 - in the intervention process
- Explicit instruction for learning skills
 - rather than relying on observation or abstraction of rules
 - rather than relying on skills and knowledge from ongoing situations

Behavioural Intervention: Principles

- **Repetition:**
 - takes longer to learn + remember
- **Consistency:**
 - regular routine + daily schedule; use verbal, visual + physical cues
- **Concrete concepts:** 1 instruction at a time
- **Rewards + redirection,** avoid punishment
- **Analysis** of behaviours
- Provide **structured environment** (physical + emotional)
- **Close supervision**
- **Modelling** of appropriate behaviour

Skill Development

- Simple, concrete instructions
- Use of clear, concrete, and immediate consequences for behaviour
- Multisensory teaching techniques
 - visual, auditory, experiential
- Training to recognize distress, or escalation - ask for/to help
- Training in anger management, social skills, relaxation, and other life skills, adapted for individuals with an FASD

http://www.fedcenter.com/behavioralTraining/course/FASDTheCourse/modified/mo06_v1.html

Strategies for Success

- **Teacher/Parent-Carer-Centred Practice Based**
- **Reframe** the way we look at behaviour

OBSERVED BEHAVIOUR

Problem behaviour

REFRAME

What is the underlying brain dysfunction?

RESPONSE

Respond to REASONS for behaviour

REINFORCE REPEAT REMEMBER

impaired learning
Impaired ability to generalise

Diagnosis allows for Reframing

- Disobedient
- Lies
- Late
- Tired
- Restless
- Attention
- Physical
- Immaturity
- Poor judgement
- Steals
- Infuriating on purpose
- Repeated mistakes
- Short Term memory
- Memory and verbal processing
- Time Organisation
- Circadian rhythm
- Sensory seeking
- Hyper and hypo
- Social cues
- Risk taking and at risk
- Ownership
- Failure to generalise
- Culmination of all above

Strategies for success

- **Visual** rather than verbal communication
 - to alert individual that behaviour is not OK
- Consequences need to be **immediate**
 - add chore rather than take away privilege
- Provide a calming down area
- **Collaboration** between school, family, probation, detention

Behavioural Interventions

- <http://pubs.niaaa.nih.gov/publications/arh341/64-75.htm>

