

Alcohol and Fetal Alcohol Spectrum Disorders

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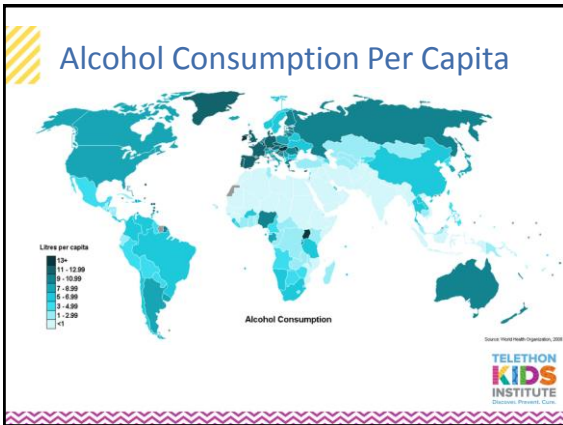


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Percentage of Global Disability Adjusted Life Years (total: 1.53 billion)

<ol style="list-style-type: none"> 1. Childhood underweight 2. Unsafe sex 3. Alcohol use 4. Unsafe water, sanitation, hygiene 5. High blood pressure 6. Tobacco use 7. Suboptimal breastfeeding 8. High blood glucose 9. Indoor smoke from solid fuels 10. Overweight and obesity 11. Physical inactivity 12. High cholesterol 13. Occupational risks 14. Vitamin A deficiency 15. Iron deficiency 16. Low fruit and vegetable intake 17. Zinc deficiency 18. Illicit drugs 19. Unmet contraceptive need 	<p>Conservative estimates:</p> <ul style="list-style-type: none"> 3.2% of the global deaths 4.0% of the global DALYs. <p>unintentional injuries contributed most to alcohol-attributable mortality burden</p> <p>neuropsychiatric diseases contributed most to alcohol-attributable disease burden</p>
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Alcohol as a Risk Factor for Global Burden of Disease
Rehm K¹, Rehm K¹, Monteiro M², Geisic C³, Graham K⁴, Rehm K⁵, Samojlik C^{1,7}, Jernigan D⁸, ¹Alcohol Research Institute, Zurich, Switzerland; ²Center for Addictions and Mental Health, Toronto, ON, Canada; ³University of Toronto, Toronto, ON, Canada; ⁴Center for Alcohol and Drug Dependence and ⁵Center for Alcohol and Drug Dependence, ⁶Management of Substance Dependence, World Health Organization (WHO), Geneva, Switzerland; ⁷Research Institute for Alcohol Problems and ⁸Center for Alcohol and Drug Dependence, ⁹Department of Psychology, University of Guelph, Guelph, Ontario, Canada; ¹⁰Department of Psychology, University of Western Ontario, London, ON, Canada; ¹¹University of Sheffield, Sheffield, UK; ¹²USA
and Health Policy Institute, Georgetown University, Washington, D.C., USA
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Australia clearly has a drinking problem

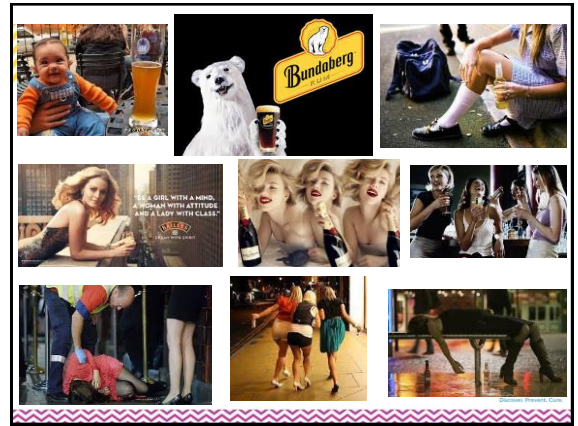
- 20% of Australians drink at risky levels for long term harm > 2 std drinks per day (1)
- 40% of Australians drink at risky levels for short term harm > 4 drinks during a single drinking occasion (1)
- The cost to the community of alcohol consumption in Australia was estimated to be \$15.3 billion in 2004/05 (2)

1. (ARHW), 2.(Collins and Lapsley 2008)



Throughout the Life course



There is an association between alcohol advertising exposure and alcohol expectancies


- beliefs about the effects of alcohol
 - (Lipsitz et al. 1993; Stacy et al. 2004)
- drinking intentions
 - (Grube and Wallack 1994; Kelly and Edwards 1998)
- current or future drinking
 - (Casswell and Zhang 1998; Wyllie et al. 1998)

17.4% students aged 12-17 years are current drinkers

- Involvement with alcohol increased with age
 - 8% of 13-year-olds
 - 37% of 17-year-olds.
- All older students, lower proportion drinking > 4 std drinks on any one occasion
 - 2005 (23%)
 - 2008 (18%)
 - 2011 (16%)

Current drinkers

- Greater than 1/3rd (37.0%) drank at risky levels
 > 4 std drinks *on any one occasion*
- Average no., of std drinks *on any one occasion*
 7.6 drinks by males
 5.6 by females
- 45.1% of 16-17 year olds
 "intend to get drunk"




Youth: overall use of alcohol has declined-risky drinking continued

Overall use of alcohol has been declining for the past six years

86% in 2005 to 74% in 2011 ~ever consumed alcohol

"drinking patterns of adolescents in the final years of secondary school can be predictive of their drinking levels in the early years of adulthood"

http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/Publishing.nsf/content/BCBF682C638E1202CA2578C002081502516/NationalDrugStrategy_Report_FINAL_0504_07_12.pdf



Fetal Alcohol Spectrum Disorders



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"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






In-utero exposure to alcohol

- Almost 50% of pregnancies are unplanned
- "Normal" Rates of drinking among a percentage of women is at a binge level
- Aboriginal women drink less than Non-Aboriginal women
- Asking about alcohol use difficult ~ stigma

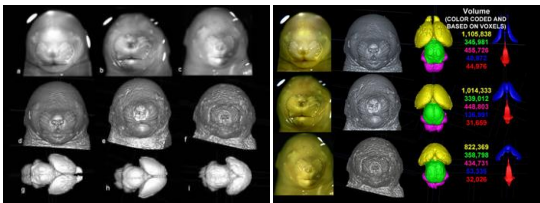


Alcohol is a teratogen - interrupts or alters the normal development of a fetus, including the development of the brain or other major organs





Animal Studies



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

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Disorders: Prenatal, Child


How much alcohol?

- We don't know how much alcohol, **if any**, is safe to drink during pregnancy
- Evidence: risk of harm to the fetus is greater the more alcohol the mother consumes; binge drinking is harmful
- 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

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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



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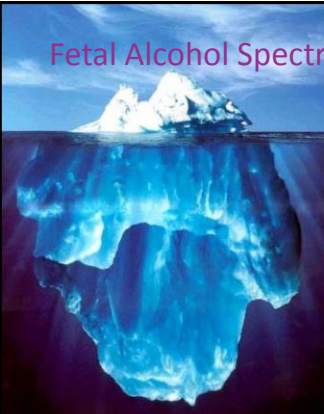
Example of dose and timing

- 10% random sample live births 1995-1996
 - 61% follow-up at 8 years
 - Postpartum alcohol questionnaire (+3m)
 - CBCL
- Outcomes
 - High level alcohol 1st trimester
 - Anxiety/depression (OR 2.82), somatic complaints (OR 2.74)
 - Moderate levels of alcohol
 - Anxiety/depression (OR 2.24)

O'Leary et al. Evidence of a complex association between dose, pattern and timing of prenatal alcohol exposure and child behaviour problems. ADDICTION 105, 74-86

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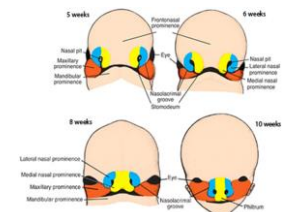

Fetal Alcohol Spectrum Disorders



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

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Clinical Features of Fetal Alcohol Syndrome (FAS)

small nose (distance from A to B)
thin upper lip
micrognathia (small jaw)
Please do not copy or distribute this photograph without permission from Susan Ashby, Ph.D.

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Embryology-time frame for the Brain

The diagram illustrates the development of the brain in nine stages: 3 weeks, 4 weeks, 5 weeks, 7 weeks, 11 weeks, 4 months, 6 months, 8 months, and Newborn. Each stage shows a yellow-colored brain structure on a profile of a developing head, showing the progression from a simple neural tube to a complex, folded brain.

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Palpebral Fissure

This slide shows three clinical photographs of a child's eyes. The top-left photo shows the inner and outer corners of the eye labeled 'endocanthion' and 'exocanthion' respectively. The top-right photo shows a ruler placed horizontally across the eye opening. The bottom photo shows a white circle with '1.91 cm' written inside, positioned over the eye opening, with 'B' and 'A' labels on either side. A ruler is also visible at the bottom of this photo.

Cranston, M. E., A. A. Mhanni, et al. (2009). "Concordance of three methods for palpebral fissure length measurement: assessment of fetal alcohol spectrum disorder." *Canadian Journal of Clinical Pharmacology* 16(1): e234-e241.

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Facial Photography

Two photographs of a young boy's face. The left photo is a frontal view with a white circle and '1.91 cm' written above the child's eyes. The right photo is a profile view of the same child's face.

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Lip Circularity

Four close-up photographs of a child's lips. The top two photos show the lips from a slightly elevated angle, and the bottom two show them from a lower angle. The right two photos have black outlines drawn around the lips to illustrate their circular shape.

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A realistic illustration of a human ear, showing the outer ear (pinna) and the ear canal.


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Two photographs of a child's hand. The left photo shows the entire hand with fingers spread against a black background. The right photo is a close-up of the fingers, showing the skin texture and nail beds.



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Neurodevelopmental disorders



- Look 'normal'
- Maybe verbal
- Often do NOT have a low IQ
- Say they know what to do
- Non-compliant and uncooperative
- Considered to be 'bad'
- Poor understanding of time
- Negative self image and lack social skills


Is there any point diagnosing FASD?



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Consequences of undiagnosed FASD

- **Consequences of undiagnosed FASD**
 - Broad and far reaching effects
- **Undiagnosed FASD adversely affects their development**
 - Loss of education
 - Loss of opportunities
- **In turn affects whole families and the wider community**
 - Increased costs of health
 - Increased costs of welfare services
 - Reduced educational opportunities
 - Reduced employment



Consequence of early engagement with juvenile justice (ABS statistics)

- **Consequences of youth offending and youth victimisation**
 - Broad and far reaching effects
- **Youth victims and youth offenders have adverse effects on development**
 - Loss of education
 - Loss of opportunities
- **In turn affects whole families and the wider community**
 - Increased costs of health
 - Increased costs of welfare services
 - Reduced educational opportunities
 - Reduced employment




Develop: 2^o...3^o... 4^o Disabilities

- Low self esteem
- Social exclusion
- Academic failure
- Unemployment
- Inability to live independently
- Mental health disorders
- Addiction
- Sexual deviance
- Problems with the justice system
 - Encounters with the law
 - Confinement



Executive Functioning



- Individuals with FASD have Executive Functioning problems
 - First encoding, memory, learning and recall
 - problem solving, remembering, changing
 - difficulties socializing with peers + sharing
 - managing conflicts, managing time
- Failures result in Rejection
 - higher probability of associating with other rejected children
 - higher probability will be involved in delinquent behaviors
 - higher probability will have problems with the law.

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Diffusion tensor imaging (DTI) revealed structural abnormalities

- Delayed white matter development during childhood and adolescence in FASD
- Longitudinal DTI and T1 weighted MRI
 - completed in 17 participants with FASD and 27 controls
 - aged 5–15 years
 - 2–3 scans each over 2–4 years
- three major white matter tracts most affected :
 - superior longitudinal fasciculus
 - superior fronto-occipital fasciculus
 - inferior fronto-occipital fasciculus.
- Reduced total brain, white, cortical gray, and deep gray matter volumes
- Fewer significant age-related volume increases in the FASD group

Trivedi et al. The Journal of Neuroscience June 22 2011 31(24):8098-8100

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Disabilities, Present, Future

Areas of dysfunction

- Central Nervous System
 - Below average intelligence
 - Delayed milestones
 - Motor abnormalities
 - Neurobehavioral disorders
 - Perceptual problems
- Neurobehavioural Disorders
 - Hyperactivity
 - Poor attention span
 - Perceptual problems
 - Poor impulse control
- Language
 - Late onset
 - Delayed use of sentences
 - Uneven expressive and receptive skills
 - Low quality masked by high fluency
- Behavioural
 - Social inappropriateness
 - Persistent temper tantrums
 - Excessive friendliness
 - Fearlessness
 - Poor response inhibition
 - Processing deficits
 - Input-output, integration deficits
 - Short-term memory loss
 - Sensory hypersensitivity
 - Perseveration

http://www.cde.state.co.us/sites/default/files/fasd_anotherlook_schoolpsychologistscounselors.pdf

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Primary Difficulties 1.

- Compromised executive functioning;**
 - difficulty planning, predicting, organizing, prioritizing, sequencing, initiating, and following through. Difficulty setting goals, complying with contractual expectations, being on time, or adhering to a schedule.
- Difficulty with memory;**
 - Information input, integration, forming associations, retrieval, and output. Difficulty learning from past experiences. Often repeats the same mistake over and over again in spite of increasingly severe punishment.
- Inconsistent memory or performance;**
 - may remember on Monday but forget by Tuesday.
 - http://www.cde.state.co.us/sites/default/files/fasd_anotherlook_schoolpsychologistscounselors.pdf

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Primary Difficulties 2.

- Difficulty with abstract concepts**
 - such as time, math, or money.
- Impaired judgment;**
 - often unable to make decisions. Difficulty understanding safety and danger, friend from stranger; of differentiating fantasy from reality.
- Inability to generalize information;**
 - difficulty forming links and associations, unable to apply a learned rule in new setting.
- Communication challenges;**
 - appears to understand instructions, nods and agrees, but is not able to comprehend. Often repeats rules verbatim, then fails to apply them.

http://www.cde.state.co.us/sites/default/files/fasd_anotherlook_schoolpsychologistscounselors.pdf

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Primary Difficulties 3.

- Language problems;**
 - difficulty comprehending the meaning of language and accurately answering questions. May agree or confabulate—comply or fill in the blanks. May talk excessively, yet be unable to engage in a meaningful exchange. The sheer volume of words may create the impression of competence.
- Slow cognitive pace;**
 - may think more slowly, say “I don’t know,” shut down, or require minutes to generate an answer rather than seconds. Those with FASD are “ten-second people in a one-second world.”
- Slow auditory pace;**
 - central auditory delays means language is processed more slowly, requiring more time to comprehend. Many students only grasp every third word of normally paced speech.
- Perseveration;**
 - may be rigid, get stuck, have difficulty switching gears, stopping an activity, or transitioning to a new one. Often reacts strongly to changes in setting, program, or personnel.


http://www.cde.state.co.us/sites/default/files/fasd_anotherlook_schoolpsychologistscounselors.pdf

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Primary Difficulties 4.

- **12. Dysmaturity;**
 - often functions socially, emotionally, and cognitively at a much younger level developmentally than chronological age. A five-year-old may be developmentally more like a two-year-old, a twelve-year old more like a six-year old.
- **13. Impulsivity coupled with inability to abstract and predict outcomes;**
 - acts first and then is able to see the problem after the fact.
- **14. Sensory systems dysfunctions;**
 - may be over-reactive to stimuli—e.g., tactile defensiveness, may be easily overwhelmed by sensory input, may be unable to filter out extraneous stimuli, symptoms of which appear as increased agitation, irritability, or aggression. May be under-reactive to pain, may not complain of earaches, broken bones, and may be unable to experience painful stimuli

<http://www.cde.state.co.us/cdes/default.asp?tab=1&subtab=1&subsubtab=1&subsubsubtab=1&subsubsubsubtab=1&subsubsubsubsubtab=1>



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“These behaviours
 are **not** intentional;
 they are the result of
 permanent brain damage.”



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Secondary Difficulties 1.

1. **Inappropriate humour;** class clown
2. **Pseudo-sophistication;** may echo words, phrases, manners, and dress in order to “pass” as competent beyond their actual ability, often to their detriment
3. **Fatigued, irritable, resistant, argumentative**
4. **Anxious,** fearful, chronically overwhelmed
5. **Frustrated,** angry, defensive, destructive
6. **Poor self concept,** often masked by unrealistic goals or self-aggrandizement
7. **Isolated,** few friends, picked-on
8. **Family or school problems** including fighting, suspension, or expulsion
9. **May run away** or use other methods of avoidance
10. **Trouble with the law,** addictions
11. **Depressed,** may be self-destructive, suicidal

“At some time between the ages of 6 and 12 years,
 94% of children with FASD
 are diagnosed with a mental health disorder.”

Dr. Ira Chasnoff, October 18, 2007, Albany, NY.





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University of Washington; Children with a FASD

- 60% had a history of trouble with the law
- 50% had a history of confinement
 - jail, prison, residential drug treatment facility, or psychiatric hospital
- The average age beginning to have trouble = 12.8 years
 - easily led by others and tend to be impulsive.






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Comparisons with common comorbidities

Behaviour and response	FASD	ADHD	ODD
Takes Risks	Does not perceive danger	Acts impulsively	Pushes the envelope; feels omnipotent
response	Provide mentor; utilize a lot of repeated role play	Utilize behavioural approaches (e.g., stop and count to 10)	Psychotherapy to address issues; protect from harm

Dan Dubovny, SAMHSA FASD Center for Excellence <http://www.cde.state.co.us/cdes/default.asp?tab=1&subtab=1&subsubtab=1&subsubsubtab=1&subsubsubsubtab=1&subsubsubsubsubtab=1>



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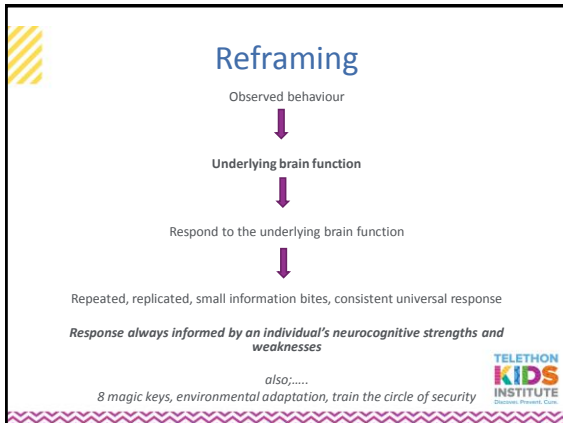
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Behaviour and response	FASD	ADHD	ODD
Does not complete tasks	May or may not take in information; cannot recall information when needed; cannot remember what to do	Takes in information; can recall information when needed; gets distracted	Takes in information; can recall information when needed; choose not to do what they are told
response	Provide one direction at a time	Limit stimuli and provide cues	Provide positive sense of control; limits and consequences

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Behaviour and response	FASD	ADHD	ODD
Hits Others	Someone told them to; misinterprets intentions of others; may sense bump as attack; may respond from history of abuse	Frequently an impulsive act	Plans to hurt others; misinterprets intentions of others as attack or impending attack
response	Deal with misinterpretations at the time; one-to-one support	Behavioural approaches to address impulsivity	Consequences; cognitive behavioural approaches

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Some resources

- Teaching students with FASD
 - <http://www.fldoe.org/ese/pdf/fetalcn.pdf>
- Eight Magic Keys
 - <http://www.fasdcenter.samhsa.gov/documents/EightMagicKeys.pdf>
- NOFASD
 - <http://www.nofasd.org.au/>
 - <http://www.fasdoutreach.ca/files/downloads/Churchill%20Report.pdf>

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- ### Eight Magic Keys
1. Concrete
 2. Consistency
 3. Repetition
 4. Routine
 5. Simplicity
 6. Specific
 7. Structure
 8. Supervision
- TELETHON KIDS INSTITUTE
Dan Dubovik, SAMHSA FASD Center for Excellence
Deb Evensen and Jan Lutke 1997


How much alcohol?

Guideline 3: Children and young people under 18 years of age

- under 18 years of age, not drinking alcohol is the safest option.

Guideline 4: Pregnancy and breastfeeding

- Maternal alcohol consumption can harm the developing fetus 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.

<https://www.nhmrc.gov.au/your-health/alcohol-guidelines>


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AUDIT-C Questionnaire

1. How often do you have a drink containing alcohol?


- Never
- Monthly or less
- 2-4 times a month
- 2-3 times a week
- 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day?

- 1 or 2
- 3 or 4
- 5 or 6
- 7 to 9
- 10 or more

3. How often do you have six or more drinks on one occasion?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily



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Three starter questions for asking about alcohol use in pregnancy

- Was your pregnancy planned?
- How many weeks were you when you recognised that you were pregnant?
- Did you change any of your lifestyle factors once you recognised that you were pregnant?
 - embed timing, frequency and dose of risk and protective factors eg: alcohol with exercise, iron, omega 3, smoking, etc

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Links

- <http://telethonkids.org.au/>
- <http://alcoholpregnancy.telethonkids.org.au/>
- <http://www.nofasd.org.au/resources/useful-links#iarft>
- <http://rffada.org/>
- <http://www.fare.org.au/research-development/featured-research/foetal-alcohol-spectrum-disorders-2/>

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Thank you

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