The Royal Australian and New Zealand College of Obstetricians and Gynaecologists
Excellence in Women's Health

Substance use in pregnancy

This statement has been developed and reviewed by the Women's Health Committee and approved by the RANZCOG Board and Council.

A list of Women's Health Committee Members can be found in Appendix A.

Disclosure statements have been received from all members of this committee.

Disclaimer This information is intended to provide general advice to practitioners. This information should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient. This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The document has been prepared having regard to general circumstances.

First endorsed by RANZCOG: November 2013
Current: March 2018
Review due: March 2021

Objectives: To provide advice on the management of substance use in pregnancy.

Target audience: Health professionals providing maternity care, and patients.

Values: The evidence was reviewed by the Women's Health Committee (RANZCOG), and applied to local factors relating to Australia and New Zealand.

Validation: This statement was compared with WHO and SOGC guidance on this topic.

Background: This statement was first developed by Women's Health Committee in November 2013 and reviewed in March 2018.

Funding: The development and review of this statement was funded by RANZCOG.

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1. Summary of recommendations

Recommendation 1	Grade
A verbal screen should be undertaken to identify substance use. If identified, sensitive counselling and referral to an appropriate multidisciplinary drug and alcohol management program should be undertaken.	Consensus-based recommendation
Recommendation 2	**Grade**
Concurrent referral to a perinatal mental health service may also be indicated on history and or depression inventory score and, if indicated, to a women's mental health service.	Consensus-based recommendation
Recommendation 3	**Grade**
If potentially harmful alcohol use is suspected, the T-ace screening tool may be used.[1] Where there is evidence of pathological drinking behaviour, involvement of a drug and alcohol specialist in counselling and care is appropriate.	Consensus-based recommendation
Recommendation 4	**Grade**
There should be involvement of a multidisciplinary team where substance or alcohol use is known or suspected.	Consensus-based recommendation
Recommendation 5	**Grade**
Where appropriate, pregnant women with identified substance use should be re-screened for blood borne viruses, Hepatitis B, Hepatitis C and HIV later in pregnancy.	Consensus-based recommendation

2. Introduction

Substance use in pregnancy is a common and important issue in maternity care. The use of tobacco and alcohol are common, but the use of cannabis, opioid analgesics, heroin, amphetamines and newer "synthetic" drugs are also important. The simultaneous use of several drugs ('polysubstance use') is a common phenomenon. Patterns of substance use before pregnancy are important considerations, as such use commonly carries into pregnancy.[2, 3] There are also recognised differences between urban, rural, and remote populations in both Australia and New Zealand.[4]

Substance use is associated not only with adverse pregnancy outcomes, but with a cascade of health, legal, social, and financial problems that adversely affect the welfare of the mother and child. For these reasons, broad psychosocial assessment is necessary to understand the reasons[5] for the woman's substance use, helping allow these to be addressed.

3. Discussion and recommendations

3.1 Incidence and costs

The incidence of substance use in pregnancy differs among populations.[2] The economic cost of the increased incidence of preterm birth and small for dates neonates associated with substance use in pregnancy[6] is considerable.

3.2 Diagnosis

Substance use may be identified through antenatal screening.[7] If identified, sensitive counselling and referral to an appropriate multidisciplinary drug and alcohol management program should be undertaken. Concurrent referral to a perinatal mental health service may also be indicated on history and or a depression inventory score.[8] If potentially harmful alcohol use is suspected, the T-ace[9] questionnaire may be used.

Multidisciplinary teams can better respond to crisis and help obtain secure accommodation, basic necessities and legal support. Education, empathy, counselling and ongoing support that is non-judgemental, respectful and culturally sensitive should be available to all pregnant women with drug dependency. If there is no disclosure of drug dependency, the diagnosis should be considered in certain clinical settings.

3.3 Barriers to care

Pregnant women with substance use disorders may be deterred by shame and fear of the judgemental remarks of others, or by a lack of access to services that are acceptable. The cost of health services including antenatal care can be prohibitive.

Inappropriate environments such as an emergency department or an inpatient ward lacking privacy inhibit the disclosure of substance use as this is usually only discussed in a supportive environment.

3.4 Co-existing mental health disorders

Anxiety and depression, bipolar disorder, schizophrenia or personality disorders may[10] contribute to substance use in pregnancy, or may be the effect[5] of substance use. If a mental health disorder[11] is

suspected, referral to a mental health service,[8] liaison psychiatrist, or community mental health service should be undertaken. Consent must be obtained before contacting other care providers.

3.5 Safety

Threatened or actual violence to other persons in the health care facility is managed by zero tolerance and involvement of Security Services or Police. A Treatment Contract may be helpful. Exclusion from the health care facility may rarely be required as a temporary measure.

3.6 Management

The following specialised modules of care may be undertaken as deemed appropriate:

1. Treatment of withdrawal, including pharmacotherapy.
2. Provision of information about substance use, and encouragement to participate in decisions about care.
3. Involvement of the partner, family, the extended family and community according to the woman's preference and available supports.
4. Medical, mental health, psychosocial, pregnancy, and drug and alcohol management, and care of co-morbidities.
5. Pre-birth child protection notification to be made.
6. Links to community or Indigenous health, mental health, drug and alcohol support services, midwifery and or neonatal nursing services, outreach services, general practitioner or Flying Doctor services should be established and maintained.
7. Pre- birth liaison with paediatric colleagues to provide early counselling for parents of possible outcomes for baby
8. Management of Neonatal Abstinence Syndrome if this occurs.
9. Information, counselling and support are provided to minimise the incidence of relapse.
10. Appropriate follow-up arrangements are made for both mother and baby.

3.7 Neonatal Abstinence Syndrome

Monitoring of the neonate is recommended, with neonatal abstinence syndrome scoring according to the appropriate guidelines. The neonate of a woman with substance use disorder may develop signs of withdrawal, usually within the first week of life. Opioids, alcohol, cannabis, benzodiazepines, amphetamines and antidepressants are most commonly implicated. The effect on the neonate depends on the substance used, the amount, duration, maternal renal and hepatic function and whether full-term or preterm.[12]

4. Substance use in pregnancy

4.1 Alcohol

Use of alcohol in pregnancy is common.[13] Less than 1% of women report alcohol use in pregnancy to maternity care givers, but population surveys show that one third drink some alcohol during pregnancy, commonly in the setting of an unplanned pregnancy[14] and two thirds drink some alcohol during lactation.[2] Alcohol is a teratogen. The sensitivity of the fetus to the adverse effects of alcohol varies between women, and between different stages of gestation. Internationally, there is no consensus on a safe level of alcohol use during pregnancy and while breast feeding.

Alcohol consumption in pregnancy can have differing effects upon the fetus, including lifelong problems such as the Fetal Alcohol Spectrum Disorder. The impact and nature of this can be related to both the amount of alcohol consumed and to when in the pregnancy it was consumed.

Heavy alcohol consumption in pregnancy can lead to the development of the Fetal Alcohol Syndrome, which can result in varying degrees of neurodevelopmental and intellectual impairment and can include facial dysmorphic changes.[15]

Systematic review of the evidence for low to moderate alcohol intake[16] shows that fetal damage is dose-related. Drinking lesser amounts regularly, or partaking in episodes of binge drinking, can result in lesser forms of problems seen within the Fetal Alcohol Syndrome, including physical, mental and behavioural problems which can be lifelong. These risks are likely to be greater the more alcohol that is consumed.

The effects of low levels of alcohol consumption are difficult to ascertain with few good quality studies available. It is not possible to say that drinking low levels of alcohol causes no risk to the fetus, although if a woman has consumed low levels of alcohol early in her pregnancy, she should be reassured that the risk of harm to her fetus is very small.

One study[17] showed an increase in child behavioural problems following moderate antenatal alcohol intake, and the CMO Alcohol Guidelines Review[18] suggested that the risks of low birth weight, preterm birth and intrauterine growth restriction were higher if the mother drank low levels of alcohol regularly, and increased the more that was consumed.

Given that low levels of drinking may have a harmful effect upon the fetus, the safest and best advice is not to drink alcohol at all during the pregnancy.

Dependence can be assessed with an alcohol withdrawal scale.[19] With heavy alcohol use, thiamine 100mg daily (preferably by intramuscular or intravenous injection) should be considered.[20]

If a woman accepts the advice to cease drinking alcohol, inpatient treatment, or outpatient support may be arranged according to circumstances.

Follow-up care and ongoing support are required.[21]

4.2 Tobacco

Smoking during pregnancy is harmful to both the mother and fetus. The 2002 United States Linked Birth/Infant Death Data Set reveals that it remains one of the most prevalent preventable causes of infant death and illness.[22]

In 2010, 11.7% of Australian women smoked during some or all of their pregnancy. In the period before they knew they were pregnant, 11.7% of pregnant women smoked and 7.7% reported that they smoked after they knew they were pregnant. The likelihood of smoking during pregnancy was higher among teenagers, women in disadvantaged circumstances and Indigenous women.[23]

Many of the constituents of cigarette smoke are potentially toxic to the developing fetus, including lead, nicotine, cotinine, cyanide, cadmium, mercury, carbon monoxide and polycyclic aromatic hydrocarbons (PAHs).

Carbon monoxide leads to potential hypoxic changes by binding to the haemoglobin molecule. Cadmium, a carcinogen, accumulates in the placenta and has been detected in umbilical cord blood, and is associated with a reduction in fetal capillary volume. Nicotine has been found in fetal blood, amniotic fluid and breast milk.[24]

Smoking disturbs the development of the placenta, potentially disrupting the implantation process and interfering with the transformation of the uterine spiral arteries. Studies show thickening of the villous membrane of the placenta in smokers, lessening the ability of the placenta to function. Nicotine also impairs amino acid transport across the placenta. These changes increase the risk of intrauterine fetal growth restriction and preterm birth.[24]

Other pregnancy complications associated with smoking include: spontaneous abortion, ectopic pregnancy, placental abruption, and premature rupture of the membranes all of which contribute to an increased risk of preterm delivery and neonatal morbidity and mortality. Non-disclosure of smoking in pregnancy is widespread. Disclosure is improved by asking "do you smoke the same as before you were pregnant?" or "do you smoke less since you found out you were pregnant?", or "do you smoke occasionally?" compared to "do you smoke?".[25] Counselling, nicotine patches,[26] and telephone support services have been shown to be effective in reducing the incidence of smoking.[27]

4.3 Cannabis

There are no national population-based studies and few evidence-based studies on the effects or the management[28] of cannabis use[29] in pregnancy or lactation. The self-reported prevalence of cannabis use during pregnancy ranges from 2% to 5% in most studies. Cannabinoids, which are absorbed from the lungs when smoked or from the gastrointestinal tract when ingested, mediate the effects of cannabis. Tetrahydrocannabinol (THC) is a small molecule that is distributed rapidly to the brain and fat. Metabolized by the liver, the half-life of THC varies from 20–36 hours in occasional users to 4–5 days in heavy users and may require up to 30 days for complete excretion. In animal models, THC crossed the placenta, producing fetal plasma levels that were approximately 10% of maternal levels after acute exposure. Significantly higher fetal concentrations were observed after repetitive exposures.[30]

It can difficult to be certain about the specific effects of cannabis on pregnancy and the developing fetus, partly because those who use it often use other drugs as well, including tobacco, alcohol, or other illicit drugs. Cannabis smoke contains many of the same respiratory disease-causing and carcinogenic toxins as tobacco smoke, often in concentrations several times greater than in tobacco smoke. Adverse socioeconomic conditions, such as poverty and malnutrition, may contribute to outcomes otherwise attributed to cannabis as well.

There is evidence of higher rates of cannabis use in more remote communities, causing financial hardship and an increased rate of mental health disorders including psychosis, depression and suicide.[21]

There is evidence of neurodevelopmental deficit or delay in the neonates and children of cannabis users in pregnancy and lactation, including cognitive deficit, visuospatial dysfunction, impulsivity, inattention and depression in children of women who have used cannabis in pregnancy or lactation.[31] Due to this, as well as the maternal and fetal exposure to the adverse effects of smoking, women who are pregnant or contemplating pregnancy should be encouraged to discontinue cannabis use.

4.4 Opioids

A small number of pregnant women use heroin, usually with other substances.[2] Use in conjunction with benzodiazepines, alcohol, analgesics, or antihistamines may cause respiratory depression and death. Oxycodone use occurs more frequently than heroin use in some areas. Substance dependency due to the use of opioid analgesics may occur. Opioid use in pregnancy affects the capacities for self-care and for safe parenting.

Counselling about intravenous substance use should include discussion of the hazards of transmission of blood borne viruses such as Hepatitis B, Hepatitis C, Human Immunodeficiency Virus, as well as the risk of bacterial endocarditis and local IV site infection. Rh and other atypical red cell antigens in contaminated syringes can cause isoimmunisation but fortunately it is uncommon.[8]

Dependent opioid users are managed with psychosocial support, pharmacotherapy[32] with methadone or buprenorphine (including appropriate dose escalation in pregnancy as needed), management of comorbidities and management of neonatal abstinence syndrome if this occurs.

4.5 Benzodiazepines

Benzodiazepines may be used in pregnancy to manage anxiety until other medicines take effect. They are not appropriate for long-term use because dependence occurs readily. Unprescribed use to manage hyperactivity associated with the use of stimulants may lead to dependence. There are no confirmed teratogenic effects, however benzodiazepines may cause respiratory depression and death if combined with alcohol or opioids.

Tolerance to benzodiazepines occurs and dependent users may require high doses until the problem is addressed. Benzodiazepine withdrawal syndrome mimics anxiety and panic attacks, and may lead to seizures.

Short-acting benzodiazepines more readily lead to dependency but have less direct effect on the neonate in breastfeeding mothers. Initial use may occur in opioid users when the opioid supply does not meet the woman's needs or when methadone doses are sub-therapeutic.

Long-acting benzodiazepines are more readily discontinued but may cause neonatal hypotonia.

4.6 Methamphetamine/ Ice

The incidence of methamphetamine use in pregnancy is likely to be increasing. This may have both maternal and neonatal consequences.[33] Studies on MA-exposed pregnancy outcomes have been limited because of retrospective measures of drug use, lack of control for confounding factors: other drug use, including tobacco; poverty; poor diet; and lack of prenatal care. One study by Wright *et al.* concluded that MA use during pregnancy was associated with a higher incidence of preterm birth and lower birth weight, especially if used continuously during pregnancy. They also concluded that stopping MA use at any time during pregnancy improved birth outcomes.[34]

MA use increases mental and physical activity producing tachycardia, arrhythmia and elevated body temperature. Long-term use may lead to mental health disorders including anxiety and depression, confusion, a tendency to violence and insomnia. The consequences of intravenous substance use described above apply. The neonate[35] or child of methamphetamine users in pregnancy may show long-term neurobehavioral disorders.

4.7 Cocaine, Gamma-hydroxybutyrate,37 Volatiles and others

These substances are used less frequently by pregnant women than alcohol, tobacco, opioids, benzodiazepines and methamphetamine.[2] Cocaine use in pregnancy may lead to placental abruption and fetal or neonatal cerebro-vascular events. Appropriate consultation or referral is recommended.

5. Conclusion

Substance use disorders have implications for pregnancy care, neonatal care, education, employment, social justice, relationships, physical and mental health, legislation and policing.

Research may be hampered by poor reporting, possible observer bias and by polysubstance use, leading to poor quality data.

Similar ethical constraints occur to those constraints which apply to the study of medicines in pregnancy and lactation and to the study of nutrition.

Despite these limitations, much can be done to improve women's health, mental health and pregnancy outcomes and to address the root cause of their substance use.

6. Glossary

Defined Vocabulary such as ICD-10 and HL 7[36] software allows integration of data between general maternity services, and specialised maternity services that provide care to women with substance use in pregnancy, and to neonatal and paediatric services, to facilitate outcome comparisons and longitudinal research studies.

Substance [or Drug] is a term which includes ethanol (alcohol), tobacco and any psychoactive substance, prescribed medicines (usually opioid analgesics, or benzodiazepines) and medicines prescribed for others which have been appropriated.

An ICD-10 'Harmful Use' diagnosis requires a pattern of substance use that is causing damage to health. The damage may be physical (e.g. hepatitis from self-administration of injected substances) or mental (e.g. depression secondary to heavy consumption of alcohol).

An ICD 10 Dependence diagnosis requires the presence of three or more indicators of alcohol or other substance dependence. These indicators are: a strong desire to take the substance; impaired control over substance use; the occurrence of a withdrawal syndrome on ceasing or reducing use; tolerance to the syndrome on ceasing or reducing use; tolerance to the effects of alcohol or other substances, as indicated by needing larger doses to achieve the desired psychological effect; obtaining, using and recovering from alcohol or other substances take up a disproportionate amount of the user's time; and the user continues to drink alcohol or to take other substances despite associated problems. The problem should have been experienced for at least one month during the previous year to qualify for a diagnosis.

'Withdrawal' means any physical or mental symptoms which are precipitated by ceasing substance use, possibly due to inability to obtain further supplies of the substance of dependence.

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8. Other suggested reading

1. The NHMRC Australian Guidelines to Reduce Health Risks from Drinking Alcohol
http://www.nhmrc.gov.au/guidelines/publications/ds10

9. Links to other College statements

1. Evidence-based Medicine, Obstetrics and Gynaecology (C-Gen 15)
http://www.ranzcog.edu.au/component/docman/doc_download/894-c-gen-15-evidence-based- medicine-obstetrics-and-gynaecology.html?Itemid=341

Appendices

Appendix A Women's Health Committee Membership

Name	Position on Committee
Professor Yee Leung	Chair
Dr Joseph Sgroi	Deputy Chair
Associate Professor Lisa Hui	Member
Associate Professor Ian Pettigrew	EAC Representative
Associate Professor Rosalie Grivell	TAC Representative
Professor Susan Walker	Member
Dr Tal Jacobson	Member
Dr Ian Page	Member
Dr John Regan	Member
Dr Craig Skidmore	Member
Associate Professor Janet Vaughan	Member
Dr Bernadette White	Member
Dr Scott White	Member
Associate Professor Kirsten Black	Member
Dr Greg Fox	College Medical Officer
Dr Marilyn Clarke	Chair of the ATSI WHC
Dr Martin Byrne	GPOAC Representative
Ms Catherine Whitby	Community Representative
Ms Sherryn Elworthy	Midwifery Representative
Dr Michelle Proud	Trainee Representative

Appendix B Overview of the development and review process for this statement

i. Steps in developing and updating this statement

This statement was originally developed in November 2013 and was most recently reviewed in March 2018. The Women's Health Committee carried out the following steps in reviewing this statement:

- Declarations of interest were sought from all members prior to reviewing this statement.
- Structured clinical questions were developed and agreed upon.
- An updated literature search to answer the clinical questions was undertaken.
- At the March 2018 face-to-face committee meeting, the existing consensus- based recommendations were reviewed and updated (where appropriate) based on the available body of evidence and clinical expertise. Recommendations were graded as set out below in Appendix B part iii)

ii. Declaration of interest process and management

Declaring interests is essential in order to prevent any potential conflict between the private interests of members, and their duties as part of the Women's Health Committee.

A declaration of interest form specific to guidelines and statements was developed by RANZCOG and approved by the RANZCOG Board in September 2012. The Women's Health Committee members were required to declare their relevant interests in writing on this form prior to participating in the review of this statement.

Members were required to update their information as soon as they become aware of any changes to their interests and there was also a standing agenda item at each meeting where declarations of interest were called for and recorded as part of the meeting minutes.

There were no significant real or perceived conflicts of interest that required management during the process of updating this statement.

iii. Grading of recommendations

Each recommendation in this College statement is given an overall grade as per the table below, based on the National Health and Medical Research Council (NHMRC) Levels of Evidence and Grades of Recommendations for Developers of Guidelines. Where no robust evidence was available but there was sufficient consensus within the Women's Health Committee, consensus- based recommendations were developed or existing ones updated and are identifiable as such. Consensus-based recommendations were agreed to by the entire committee. Good Practice Notes are highlighted throughout and provide practical guidance to facilitate implementation. These were also developed through consensus of the entire committee.

Recommendation category		Description
Evidence-based	A	Body of evidence can be trusted to guide practice
	B	Body of evidence can be trusted to guide practice in most situations
	C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
	D	The body of evidence is weak and the recommendation must be applied with caution
Consensus-based		Recommendation based on clinical opinion and expertise as insufficient evidence available
Good Practice Note		Practical advice and information based on clinical opinion and expertise

Appendix C Full Disclaimer

This information is intended to provide general advice to practitioners, and should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient.

This information has been prepared having regard to general circumstances. It is the responsibility of each practitioner to have regard to the particular circumstances of each case. Clinical management should be responsive to the needs of the individual patient and the particular circumstances of each case.

This information has been prepared having regard to the information available at the time of its preparation, and each practitioner should have regard to relevant information, research or material which may have been published or become available subsequently.

Whilst the College endeavours to ensure that information is accurate and current at the time of preparation, it takes no responsibility for matters arising from changed circumstances or information or material that may have become subsequently available.