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Disclaimer

This is a general guide to appropriate practice, to be followed subject to the relevant clinician’s judgement in each individual case. The Commonwealth has taken all reasonable steps to ensure that the Guidelines are based on, and accurately represent, the best available published evidence on key areas of antenatal care. However, the Commonwealth does not accept any legal liability for any loss, damage costs or expenses that may result from reliance on the information and recommendations contained in these Guidelines.

This publication reflects the views of the authors and not necessarily the views of the Australian Government.

Suggested citation

Clinical Practice Guidelines: Pregnancy care

Linking evidence to recommendations

2018 edition
Revised April 2019
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Introduction

The 2018 edition of *Clinical Practice Guidelines: Pregnancy Care* comprises chapters and recommendations that were developed in three stages in 2010–2011, 2012–2013 and 2016–2017. The process of guideline development, including detail on systematic review methodologies, is outlined in a separate document subtitled *Administrative Report*. This document provides a matrix that links the evidence identified through systematic reviews to the recommendations developed by the respective Expert Advisory Committees (EACs).

For topics reviewed in 2010–11 and 2012–13, the United Kingdom National Institute of Health and Clinical Excellence (NICE) *Antenatal Care. Routine Care for the Healthy Pregnant Woman* (2008) was used as a reference guideline. Separate systematic literature reviews were conducted for each topic. For most topics, relevant research questions had been considered in the NICE guidelines. The studies identified by NICE were included in the evidence tables and regraded according to the National Health and Medical Research Council (NHMRC) *Levels of Evidence and Grades for Recommendations for Developers of Guidelines* (2009). Searches were then conducted to bring the literature review up to date. Following review of the evidence, the grading of evidence and recommendations followed the NHMRC *Levels of Evidence and Grades for Recommendations for Developers of Guidelines* (NHMRC 2009).

For topics reviewed in 2016–17 and 2018–19, systematic literature reviews were conducted to identify evidence published since the previous review or from January 2008 for new topics. GRADE (Grading of Recommendations, Assessment, Development and Evaluation) methods were used to evaluate and grade the evidence. The full technical reports for these topics are available from the Australian Government Department of Health website.

Recommendations were approved by the NHMRC in December 2011, June 2014, October 2017 and April 2019, respectively. Cross-references to supporting evidence for the recommendations in this document refer to section in the full guideline document.
1 Optimising pregnancy care

1.1 Models of care for Aboriginal and Torres Strait Islander women (reviewed 2017)

<table>
<thead>
<tr>
<th>Research question</th>
</tr>
</thead>
<tbody>
<tr>
<td>How can holistic antenatal care be provided to meet the needs of Aboriginal and Torres Strait Islander women including spiritual, emotional, social, and cultural, as well as physical and healthcare needs?</td>
</tr>
</tbody>
</table>

A narrative review of studies was undertaken for this topic rather than a systematic evaluation of the evidence.

No recommendations were developed.

1.2 Antenatal care for migrant and refugee women

Based on narrative review.

1.3 Antenatal care for women with severe mental illness

Based on narrative review.

1.4 Other population groups with specific care needs

Based on narrative review.
2 Core practices in pregnancy care

2.1 Providing antenatal care services

Based on narrative review.

2.2 Antenatal visits (reviewed 2010)

<table>
<thead>
<tr>
<th>NICE recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>A schedule of antenatal appointments should be determined by the function of the appointments. For a woman who is nulliparous with an uncomplicated pregnancy, a schedule of ten appointments should be adequate. For a woman who is parous with an uncomplicated pregnancy, a schedule of seven appointments should be adequate. [B] Early in pregnancy, all women should receive appropriate written information about the likely number, timing and content of antenatal appointments associated with different options of care and be given an opportunity to discuss this schedule with their midwife or doctor. [D] Each antenatal appointment should be structured and have focused content. Longer appointments are needed early in pregnancy to allow comprehensive assessment and discussion. Wherever possible, appointments should incorporate routine tests and investigations to minimise inconvenience to women. [D]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What is the most effective frequency of antenatal visits? (Informed Recommendation)</td>
</tr>
<tr>
<td>• In low risk pregnant women is a schedule of 7-10 visits as effective as the traditional schedule of 14 visits in achieving positive perinatal outcomes?</td>
</tr>
<tr>
<td>• In low risk pregnant women is a schedule of 7-10 visits as effective as the traditional schedule of 14 visits in terms of women’s satisfaction with care?</td>
</tr>
<tr>
<td>• What is the optimal number/timing of visits for low risk primigravida and low risk multigravida?</td>
</tr>
<tr>
<td>• When is the optimum time for a pregnant woman to have her first visit? (Limited evidence identified)</td>
</tr>
<tr>
<td>• In low risk women is a reduced schedule of visits (7-10) more cost effective than the traditional schedule of 14 visits? (No studies identified)</td>
</tr>
<tr>
<td>• What information should be provided to women about the schedule of visits? (No studies identified)</td>
</tr>
<tr>
<td>• What is the impact of a woman’s expectations about the schedule of visits on her satisfaction with care? (No studies identified)</td>
</tr>
<tr>
<td>• What is the impact of a reduced number of visits on shared care models particularly in relation to rapport building? (No studies identified)</td>
</tr>
<tr>
<td>• What are the additional considerations for Aboriginal and Torres Strait Islander Australian women? (Informed narrative)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Search strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Databases searched: Medline; Embase; Psychinfo; Cochrane Database of Systematic Reviews; Australasian Medical Index.</td>
</tr>
<tr>
<td>Date of searches: February 2009; November 2010</td>
</tr>
<tr>
<td>Limits: English language</td>
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</tbody>
</table>
Review findings

- 1 level I and 3 level IV studies identified. The Cochrane review suggests that where the number of visits is already low, these should not be further reduced.
- 1 level IV study found that initiating antenatal care in the first trimester had no significant effect on birth weight
- 1 level IV study and 2 qualitative reviews informed narrative around antenatal visits for Aboriginal and Torres Strait Islander women

New evidence is limited and does not suggest a change to the NICE recommendations. However, the evidence base is strengthened by the recent Cochrane review.

EAC recommendation

Determine the schedule of antenatal visits based on the individual woman’s needs. For a woman’s first pregnancy without complications, a schedule of ten visits should be adequate. For subsequent uncomplicated pregnancies, a schedule of seven visits should be adequate.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
<th>Applicability</th>
<th>Recommendation</th>
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</table>

Evidence supporting recommendation (see Section 8.7)


Consensus-based recommendations

At the first contact with a woman during pregnancy, make arrangements for the first antenatal visit, which requires a long appointment and should occur within the first 10 weeks.

Early in pregnancy, provide women with information in an appropriate format about the likely number, timing and content of antenatal visits associated with different options of care and the opportunity to discuss this schedule.

2.3 Antenatal visits (reviewed 2012)

NICE recommendation

A schedule of antenatal appointments should be determined by the function of the appointments. For a woman who is nulliparous with an uncomplicated pregnancy, a schedule of ten appointments should be adequate. For a woman who is parous with an uncomplicated pregnancy, a schedule of seven appointments should be adequate. [B]

Each antenatal appointment should be structured and have focused content. Longer appointments are needed early in pregnancy to allow comprehensive assessment and discussion. Wherever possible, appointments should incorporate routine tests and investigations to minimise inconvenience to women. [D]

Research question

- What is the content and timing of antenatal visits after the first trimester? [Informed narrative]

Search strategy

Date of search: 12 October 2012
Publication date range: 2003-2012
Databases searched: Medline, Embase, CINHAL
Limits: English
Final number of references included: 27

Review findings

Insufficient evidence identified to support additional recommendations.
### 2.4 Preparing for pregnancy, childbirth and parenthood (reviewed 2012)

<table>
<thead>
<tr>
<th>NICE recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women should be offered opportunities to attend participant-led antenatal classes, including breastfeeding workshops. [Recommendations on antenatal information; ungraded]</td>
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</table>

<table>
<thead>
<tr>
<th>Research questions</th>
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</thead>
<tbody>
<tr>
<td>• What is the effectiveness of antenatal classes as preparation for pregnancy, childbirth and parenting? [Informed Recommendations]</td>
</tr>
<tr>
<td>• What formal antenatal education strategies are most effective? [Informed narrative]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Search strategy</th>
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<tbody>
<tr>
<td>Date of search: 5 December 2012</td>
</tr>
<tr>
<td>Publication date range: 2003-2012</td>
</tr>
<tr>
<td>Databases searched: Medline (OVID), Embase, CINHAL (EBSCOHost), Scholar</td>
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<tr>
<td>Limits: English</td>
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<tr>
<td>Number of references included: 33</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Evidence statements</th>
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</thead>
<tbody>
<tr>
<td>Antenatal education may have an effect on knowledge and the experience of birth but does not influence birth outcomes.</td>
</tr>
<tr>
<td>Antenatal education that includes a psychological component may reduce the risk of postnatal depression at 6 weeks.</td>
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<table>
<thead>
<tr>
<th>Recommendation</th>
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<tbody>
<tr>
<td>Advise parents that antenatal education programs are effective in providing information about pregnancy, childbirth and parenting but do not influence mode of birth.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
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<th>Applicability</th>
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<table>
<thead>
<tr>
<th>Supporting evidence (see Section 9.5)</th>
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<tr>
<th>Implications for implementation</th>
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<tbody>
<tr>
<td>No implications associated with implementation of the recommendation were identified.</td>
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<table>
<thead>
<tr>
<th>Recommendation</th>
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<tbody>
<tr>
<td>Include psychological preparation for parenthood as part of antenatal care as this has a positive effect on women’s mental health postnatally.</td>
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<th>Evidence base</th>
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<th>Supporting evidence (see Section 9.5)</th>
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<tr>
<th>Implications for implementation</th>
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<tr>
<td>The EAC noted that this recommendation will change usual care and the organisation of care as this is not standard practice in all services. The recommendation will also have resource implications as health professionals may need to provide additional education or refer to a professional with expertise in psychology. Access to such services may act as a barrier to implementation, which could be addressed through use of preprepared, online or telephone resources.</td>
</tr>
</tbody>
</table>
## 2.5 Preparing for breastfeeding (reviewed 2012)

### NICE recommendation

There is evidence from RCTs that breastfeeding initiation rates and, in some instances, breastfeeding duration can be improved by antenatal breastfeeding education, particularly if this is interactive and takes place in small informal groups.

One-to-one counselling and peer support antenatally are also effective. [Evidence summary]

### Research questions

- What impact does the provision of information during pregnancy have on the initiation and duration of breastfeeding? [Informed Recommendation]
- What impact do different models of antenatal care and/or education have on breastfeeding? [Informed narrative]
- What breastfeeding advice should women receive and when should this be given? [Informed narrative]

### Search strategy

Date of search: 13 March 2012

Publication date range: 2003-2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Number of references included: 34

Date of top-up search: 29 October 2012

Number of additional references included: 3

### Evidence statement

Antenatal breastfeeding promotion can be effective in increasing initiation rates and duration of breastfeeding.

### EAC recommendation

Routinely offer education about breastfeeding as part of antenatal care.

<table>
<thead>
<tr>
<th>Evidence base</th>
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Supporting evidence (see Section 10.6)

- Dyson et al 2005; Renfrew et al 2005; Chung et al 2008; Lumbiganon et al 2011

### Implications for implementation

The EAC noted that the recommendation may lead to changes to usual care in some settings, resource implications (eg additional time required for education about breastfeeding) and changes in the way that care is organised (eg to allow for additional time for education) and that there may be barriers to implementation of the recommendation (eg financial and access issues), although this information is provided in most settings.
3 Lifestyle considerations

3.1 Nutrition (reviewed 2012; under review)

**NICE recommendations**

Iron supplementation should not be offered routinely to all pregnant women. It does not benefit the mother’s or fetus’s health and may have unpleasant maternal side effects [A]

Pregnant women should be informed that vitamin A supplementation (intake greater than 700 micrograms) might be teratogenic and therefore it should be avoided. Pregnant women should be informed that, as liver and liver products may also contain high levels of vitamin A, consumption of these products should also be avoided [C]

Pregnant women should be offered information on how to reduce the risk of listeriosis [D]

Pregnant women should be offered information on how to reduce the risk of salmonella infection [D]

**Research questions**

- What dietary advice should be provided to women in pregnancy, including population specific groups? [Informed Recommendation and narrative]
- Which foods should be avoided during pregnancy? [Informed Recommendation and narrative]

**Search strategy**

Date of search: 31 July 2012

Publication date range: 2003-2012

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Date of top-up search: 21 December 2012

Number of references included: 38

**Evidence statements**

There is insufficient evidence to confirm or refute the effectiveness of caffeine avoidance on birth weight or other pregnancy outcomes.

There is insufficient evidence to confirm or refute the association of fish intake during pregnancy and the detrimental effects of associated mercury levels.

Daily or intermittent iron supplementation reduces the risk of iron deficiency, with fewer side effects associated with intermittent supplementation.

There is insufficient evidence to support recommendations on supplements of vitamins A, C and E, calcium (excluding for its use for high risk of pre-eclampsia), zinc, magnesium, micronutrients, omega-3 fatty acids or probiotics during pregnancy.

**EAC recommendation**

Reassure women that small to moderate amounts of caffeine are unlikely to harm the pregnancy.

<table>
<thead>
<tr>
<th>Evidence base</th>
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**Evidence supporting recommendation (see Section 11.7)**

Jahanfar & Sharifah 2009; Milne et al 2011

**Implications for implementation**

No implications associated with implementation of the recommendation were identified.
**EAC recommendation**

Advise women with low dietary iron intake that intermittent supplementation is as effective as daily supplementation in preventing iron-deficiency anaemia, with fewer side effects.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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**Evidence supporting recommendation (see Section 11.7)**

Pena-Rosas et al 2012a; 2012b

**Implications for implementation**

The EAC noted that this recommendation may have positive resource implications as costs to women may be reduced.

### 3.2 Nutritional supplements (reviewed 2011; under review)

**NICE recommendation**

Pregnant women should be informed that vitamin A supplementation (intake above 700 micrograms) might be teratogenic and should therefore be avoided. Pregnant women should be informed that liver and liver products may also contain high levels of vitamin A, and therefore consumption of these products should also be avoided. [C]

Pregnant women (and those intending to become pregnant) should be informed that dietary supplementation with folic acid, before conception and up to 12 weeks of gestation, reduces the risk of having a baby with neural tube defects (anencephaly, spina bifida). The recommended dose is 400 micrograms/day. [A]

**Research questions**

- What dietary advice should be provided to pregnant women? (Informed narrative in section on weight and body mass index [BMI])
- What are the risks of vitamin and mineral supplementation in pregnancy? (Informed Recommendations)
- What are the benefits of vitamin supplementation in pregnancy? (Informed narrative)
- What are the risks of complementary medicines in pregnancy? (Informed narrative)
- What are the benefits of complementary therapies in pregnancy? (Informed narrative)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)

**Search strategy**

Databases searched: Medline; Embase; Australasian Medical Index; ATSIhealth; Google Scholar; Cochrane

Date of search: March 2011

Limits: English language

Publication dates for search: January 2003 - March 2011

**Review findings**

- 2 level I and 4 level II studies incorporated into narrative in chapter on weight and BMI.
- 1 level I study for iron; 1 Level I, 1 Level II for vitamin A; 1 Level I for vitamin C; 1 Level I for vitamin C+E supported the NICE recommendations on iron and vitamin A.
- 6 level II studies supported the use of multinutrients in women experiencing malnutrition. 1 level I study supported the NICE recommendation on folic acid supplementation. Dosage changed in line with Australian advice.
- 2 level III-2 and 1 qualitative study informed the narrative.
- 3 Level I and 2 Level II studies on acupuncture were identified.
- 3 level III-2 studies informed the narrative.
EAC recommendation

Inform women that dietary supplementation with folic acid, from 12 weeks before conception and throughout the first 12 weeks of pregnancy, reduces the risk of having a baby with a neural tube defect (for example, anencephaly or spina bifida) and recommend a dose of 500 micrograms per day.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
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Evidence supporting recommendation (see Section 11.7.2)

Bower et al 2004; 2009; De Regli et al 2010

EAC recommendation

Advise women that taking vitamin A, C or E supplements is not of benefit in pregnancy and may cause harm.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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<td>A</td>
<td>NA</td>
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</table>

Evidence supporting recommendation (see Section 11.7.2)

Kirkwood et al 2010; Rumbold & Crowther 2005; Rumbold et al 2011; van den Broek et al 2010; Xu et al 2010

EAC recommendation

Do not routinely offer iron supplementation to women during pregnancy.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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</table>

Evidence supporting recommendation (see Section 11.7.2)

Reveiz et al 2007

Consensus-based recommendation

Consensus-based recommendation on iodine is based on NHMRC (2010) NHMRC Public Statement: Iodine Supplementation for Pregnant and Breastfeeding Women. Canberra: National Health and Medical Research Council. The recommendation is based on systematic review of the literature but was not graded.

Advise women who are pregnant to take an iodine supplement of 150 micrograms each day. Women with pre-existing thyroid conditions should seek advice from their medical practitioner before taking a supplement.

3.3 Physical activity (reviewed 2012; under review)

NICE recommendations

Pregnant women should be informed that beginning or continuing a moderate course of exercise during pregnancy is not associated with adverse outcomes [A].

Pregnant women should be informed of the potential dangers of certain activities during pregnancy, for example, contact sports, high-impact sports and vigorous racquet sports that may involve the risk of abdominal trauma, falls or excessive joint stress, and scuba diving, which may result in fetal birth defects and fetal decompression disease [D].

Research questions

- What exercises are of benefit during pregnancy? [Informed Recommendation]
- What exercises are associated with adverse maternal and perinatal outcomes? [Informed narrative]
- What advice should women be given in relation to exercise during pregnancy? [Informed narrative]
Search strategy
Date of search: 16 September 2011
Publication date range: 2003–2011
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 74
Date of top-up search: 19 October 2012
Number of additional references included: 21

Evidence statements
There is high level evidence that physical activity during pregnancy improves or maintains physical fitness, improves health-related quality of life.

There is mixed evidence on the role of physical activity in preventing excessive gestational weight gain, with a greater effect among women who are overweight or obese or when physical activity is combined with dietary intervention.

EAC recommendation
Advise women that low- to moderate-intensity physical activity during pregnancy is associated with a range of health benefits and is not associated with adverse outcomes.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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Evidence supporting recommendation (see Section 11.7.3)
Kramer & McDonald 2006; Montoya Arizabaleta et al 2010; Barakat et al 2011; Ramírez-Vélez et al 2011; Robledo-Colonia et al 2012

Implications for implementation
No implications associated with implementation of the recommendations were identified.

3.4 Tobacco smoking (reviewed 2010)

NICE recommendations
At the first contact with the woman, discuss her smoking status, provide information about the risks of smoking to the unborn child and the hazards of exposure to second-hand smoke. Address any concerns she and her partner or family may have about stopping smoking.

Pregnant women should be informed about the specific risks of smoking during pregnancy (such as the risk of having a baby with low birth weight and preterm birth). The benefits of quitting at any stage should be emphasised.

Offer personalised information, advice and support on how to stop smoking. Encourage pregnant women to use local NHS Stop Smoking Services and the NHS pregnancy smoking helpline, by providing details on when, where and how to access them. Consider visiting pregnant women at home if it is difficult for them to attend specialist services.*

Monitor smoking status and offer smoking cessation advice, encouragement and support throughout the pregnancy and beyond.*

Discuss the risks and benefits of nicotine replacement therapy with pregnant women who smoke, particularly those who do not wish to accept the offer of help from the National Health Service Stop Smoking Service. If a woman expresses a clear wish to receive NRT, use professional judgement when deciding whether to offer a prescription.*

Advise women using nicotine patches to remove them before going to bed.*
This supersedes NICE technology appraisal guidance 39 on NRT and bupropion.*

Women who are unable to quit smoking during pregnancy should be encouraged to reduce smoking. [B]

* Recommendation from the NICE public health guidance on smoking cessation (www.nice.org.uk/PH010).
Research questions

- What are the maternal and perinatal outcomes associated with smoking in pregnancy? (No new studies identified)
- Do smoking cessation programs lead to reduction in smoking rates for pregnant women and what are the characteristics of smoking cessation programs that are most effective in reducing smoking among pregnant women? (Informed Recommendation)
- Do smoking cessation programs decrease perinatal mortality and morbidity? (No new studies identified)
- What interventions assist women to quit smoking? (Informed Recommendation)
- Is nicotine replacement therapy safe for pregnant women? (Informed Recommendation)
- What are additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)

Search strategy

Databases searched: Medline; Embase; Australasian Medical Index; ATSIhealth; Google Scholar; Cochrane Database

Date of searches: October 2009; November 2010

Limits: English language

Publication dates for searches:
January 2003 - October 2009
January 2008 - November 2010

Review findings

6 level I studies were identified in the NICE review that indicated a significant association between smoking in pregnancy and adverse outcomes. No additional evidence was identified.

1 level I study from NICE.

1 level 1 study from NICE.

5 level I studies, 8 level II studies, 1 level III-3 study and 3 level IV studies examined the effectiveness of smoking cessation interventions and informed the narrative (note that these Guidelines discuss assessment rather than intervention). Of these, 2 level IV studies and 2 observational studies informed the narrative on smoking cessation among Aboriginal and Torres Strait Islander women.

2 level I studies and 1 level II study supported the need for caution in considering NRT during pregnancy.

EAC recommendation

At the first antenatal visit:

- assess the woman's smoking status and exposure to passive smoking
- give the woman and her partner information about the risks to the unborn baby associated with maternal smoking and passive smoking
- if the woman smokes, emphasise the benefits of quitting as early as possible in the pregnancy and discuss any concerns she or her family may have about stopping smoking.

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<th>Evidence base</th>
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Evidence supporting recommendation (see Section 12.7)

Based on evidence from NICE.

EAC recommendation

Offer women who smoke referral for smoking cessation interventions such as cognitive behavioural therapy.

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<th>Evidence base</th>
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</table>
Evidence supporting recommendation (see Section 12.7)
Berg et al 2008; Dennis & Kingston 2008; Lumley et al 2009; Stotts et al 2009

EAC recommendation
If, after other options have been explored, a woman expresses a clear wish to use nicotine replacement therapy, discuss the risks and benefits with her.

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Evidence supporting recommendation (see Section 12.7)
Lumley et al 2009; Oncken et al 2008; Smith et al 2006

3.5 Alcohol

Consensus-based recommendations
The consensus-based recommendation is based on Guideline 4 in NHMRC (2009) Australian Guidelines to Reduce Health Risks from Drinking Alcohol. Canberra: National Health and Medical Research Council. The recommendation is based on systematic review of the literature but was not graded. Literature on prevalence of alcohol consumption and associated risks during pregnancy published subsequent to the NHMRC guidelines has not been reviewed.

Advise women who are pregnant or planning a pregnancy that not drinking is the safest option as maternal alcohol consumption may adversely affect the developing fetus.

3.6 Medicines

Consensus-based recommendations
Consensus-based recommendations are based on advice from the Therapeutic Goods Administration.

Advise women that use of prescription and over-the-counter medicines should be limited to circumstances where the benefit outweighs the risk as few medicines have been established as safe to use in pregnancy.

Therapeutic Goods Administration Category A medicines have been established to be safe in pregnancy.

3.7 Substance use (reviewed 2017)

Research questions
What are the maternal and perinatal outcomes associated with illicit substance use during pregnancy? (Informed narrative)
How can the harms associated with illicit drug use in pregnancy be reduced? (Informed narrative)

What are the additional considerations for Aboriginal and Torres Strait Islander women? (No evidence identified)

Search dates
2008 to March 2017

Outcomes analysed
Retention of women in treatment, continued illicit substance use, birth weight, preterm birth, Apgar score, neonatal abstinence syndrome

Consensus-based recommendation
Early in pregnancy, assess a woman’s use of illicit substances and misuse of pharmaceuticals and provide advice about the associated harms.
3.8 Oral health (reviewed 2010)

**NICE recommendation**

None

**Research questions**

- Are there any dental procedures or treatments that are unsafe in pregnancy? (Informed narrative)
- Does periodontal disease confer any risks to pregnancy or to the neonate? (Informed narrative)
- Does dental caries confer any risks in pregnancy or to the neonate? (Informed narrative)
- What is the optimal timing of screening for oral health? (No studies identified)
- What information/education and advice should clinicians provide for women? (Informed Recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No studies identified)

**Search strategy**

Databases searched: Medline; Embase; Australasian Medical Index; ATSIhealth; Google Scholar; Cochrane Database

Date of search: November 2010

Limits: English language

Publication dates for search: January 2003 - November 2010

**Review findings**

1 level II, 1 level III-1, 2 level III-2 and 1 level IV were inconsistent on the safety of dental treatments in pregnancy.

1 level I, 8 level II, 7 level III-2, 9 level III-3 and 14 level IV suggested that periodontal disease does not confer risks to pregnancy and informed the narrative.

2 level III-2 and 2 level IV studies were inconclusive on the risks of caries in pregnancy.

No studies identified.

1 level II and 5 level IV highlighted the importance of women receiving advice on oral health during pregnancy.

No studies identified.

**EAC recommendation**

At the first antenatal visit, advise women to have oral health checks and treatment, if required as good oral health is important to a woman’s health and treatment can be safely provided during pregnancy.

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**Evidence supporting recommendation (see Section 16.5)**

3.9 Sexual activity (reviewed 2012)

**NICE recommendation**

Pregnant woman should be informed that sexual intercourse in pregnancy is not known to be associated with any adverse outcomes. [B]

**Research questions**

- What are benefits or risks associated with sexual activity during pregnancy? [Informed Recommendation]
- What advice should women receive regarding sexual activity during pregnancy? [Informed narrative]

**Search strategy**

Date of search: 27 September 2011

Publication date range: 2003–2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Number of references included: 13

Date of top-up search: 19 October 2012

Number of additional references included: 0

**Evidence statement**

Sexual activity during pregnancy is not associated with adverse outcomes.

**EAC recommendation**

Advise pregnant women without complications that safe sexual activity in pregnancy is not known to be associated with any adverse outcomes.

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**Evidence supporting recommendation (see Section 17.5)**

Sayle et al 2001; Schaffir 2006; Yost et al 2006; Tan et al 2009; Kontoyannis et al 2011

**Implications for implementation**

No implications associated with implementation of the recommendation were identified.

3.10 Travel (reviewed 2013)

**NICE recommendations**

Pregnant women should be informed about the correct use of seatbelts (that is, three-point seatbelts “above and below the bump, not over it”). [B]

Pregnant women should be informed that long-haul air travel is associated with an increased risk of venous thrombosis, although whether or not there is additional risk during pregnancy is unclear. In the general population, wearing correctly fitted compression stockings is effective at reducing the risk. [B]

Pregnant women should be informed that, if they are planning to travel abroad, they should discuss considerations such as flying, vaccinations and travel insurance with their midwife or doctor. [Good practice point]

**Research questions**

- What are the risks for long haul air travel during pregnancy? [Informed Recommendation]
- What are the risks for car travel during pregnancy? [Informed Recommendation]
- What advice should pregnant women receive who are planning to travel abroad during pregnancy? [Informed Recommendation]
Search strategy
Date of search: 20 June 2012
Publication date range: 2003-2011
Databases searched: Medline, Embase, Cinahl.
Number of references included: 23
Date of top-up search: 10 January 2013
Number of additional references included: 4

Evidence statements
New evidence supports the NICE guidance on seat belts and long-distance air travel during pregnancy. There is evidence of low levels of knowledge about correct use of seat belts and risks associated with long-distance air travel.
There is evidence to support the use of insecticide-treated bed nets to prevent malaria.

EAC recommendation
Inform pregnant women about the correct use of seat belts; that is, three-point seat belts ‘above and below the bump, not over it’.

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</table>

Evidence supporting recommendation (see Section 18.5)

Implications for implementation
No implications associated with implementation of the recommendation were identified.

EAC recommendation
Inform pregnant women that long-distance air travel is associated with an increased risk of venous thrombosis and pulmonary embolism, although it is unclear whether there is additional risk during pregnancy.

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<th>Evidence base</th>
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<th>Clinical impact</th>
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</table>

Evidence supporting recommendation (see Section 18.5)
Kingman & Economides 2003; Voss et al 2004

Implications for implementation
No implications associated with implementation of the recommendation were identified.

EAC recommendation
If pregnant women cannot defer travel to malaria-endemic areas, advise them to use insecticide-treated bed nets.

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<th>Clinical impact</th>
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Evidence supporting recommendation (see Section 18.5)
Gamble et al 2006; Jacquerioz & Croft 2009

Implications for implementation
The EAC noted that this recommendation may change usual care and the organisation of care as this advice may not be offered routinely. This may have resource implications (eg additional time required to discuss overseas travel plans and costs to women of insecticide-treated bed nets), which may act as barriers to implementation, although this recommendation would only apply to a small proportion of women.
4 Clinical assessments

4.1 Weight and body mass index (reviewed 2010)

<table>
<thead>
<tr>
<th>NICE recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal weight and height should be measured at the first antenatal appointment, and the woman’s BMI calculated (weight [kg]/height[m]^2). [B]</td>
</tr>
<tr>
<td>Repeated weighing during pregnancy should be confined to circumstances where clinical management is likely to be influenced. [C]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research questions</th>
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</thead>
<tbody>
<tr>
<td>• How and when should maternal weight, height and BMI be measured in the general maternity population? (Informed Recommendation)</td>
</tr>
<tr>
<td>• What information should be provided to women regarding healthy weight in pregnancy? (Informed Recommendation)</td>
</tr>
<tr>
<td>• What dietary advice should be provided to pregnant women (see review on nutritional supplements)</td>
</tr>
<tr>
<td>• What specific risk assessments are required for pregnant women above and below their most healthy weight? (Informed narrative)</td>
</tr>
<tr>
<td>• What are the additional needs of Aboriginal or Torres Strait Islander women? (Informed narrative)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Search strategy</th>
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<tbody>
<tr>
<td>Databases searched: Medline; Embase; Informit; Cochrane Database of systematic Reviews; Australasian Medical Index.</td>
</tr>
<tr>
<td>Date of search: November 2010</td>
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<tr>
<td>Limits: English language</td>
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<tr>
<td>Publication dates for search: January 2003 - November 2010</td>
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</table>

<table>
<thead>
<tr>
<th>Review findings</th>
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<tbody>
<tr>
<td>There is evidence from 5 level III-2 studies to support the NICE (2003) recommendation to record height, weight and BMI at the antenatal booking visit and this is advised in other clinical practice guidelines.</td>
</tr>
<tr>
<td>New evidence regarding the risks associated with a high or low pre-pregnancy BMI has emerged since the NICE (2003) recommendation, including 1 level I, 4 level II, and 7 level III-2 studies. The evidence is also consistent regarding the risk of excessive gestational weight gain for women of normal to high pre-pregnancy BMI, and the risk of poor weight gain for women who have a pre-pregnancy BMI in the underweight category. Recommendations for gestational weight gain are less clear.</td>
</tr>
<tr>
<td>2 level I and 4 level II studies were identified that supported the provision of verbal and written information.</td>
</tr>
<tr>
<td>There is evidence from 7 level III-2 studies and 1 level IV study to support assessment of the associated risks of high pre-pregnancy BMI and enhanced surveillance for small-for-gestational age babies for women with a pre-pregnancy BMI in the underweight category. This informed the narrative.</td>
</tr>
<tr>
<td>1 level III-2 and 1 level IV study informed the narrative on risks associated with low pre-pregnancy BMI.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Consensus-based recommendations</th>
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<tbody>
<tr>
<td>Measure women’s weight and height at the first antenatal visit and calculate their body mass index (BMI) to inform gestational weight gain.</td>
</tr>
<tr>
<td>Give women advice about appropriate weight gain during pregnancy in relation to their pre-pregnancy BMI (if recorded) or their BMI at the first antenatal visit.</td>
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</table>
4.2 Monitoring weight gain (reviewed 2016)

Research questions

- Should women have their weight routinely monitored in pregnancy (self-monitored or otherwise)? (Informed narrative)
- What are the potential benefits and harms of routine weight monitoring during pregnancy? (Informed narrative)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No studies identified)
- What are the additional considerations for women from culturally and linguistically diverse groups? (No studies identified)

Search dates

2008 to May 2016

Outcomes analysed

Gestational diabetes, macrosomia, excessive weight gain in pregnancy, mean weight gain (kg/week), pre-eclampsia, gestational hypertension

Evidence statements

- Excessive gestational weight gain, mean weekly weight gain and rates of gestational diabetes, pregnancy induced hypertension, pre-eclampsia and macrosomia do not differ significantly between women weighed regularly during pregnancy and those receiving usual care (low quality evidence).
- Self-weighing combined with advice on weight gain may slightly reduce mean weight gain compared with usual care but does not influence excessive weight gain (moderate quality evidence).
- Self-weighing combined with advice on weight gain compared to usual care reduces excessive weight gain and mean weight gain in women with a BMI of 26 to 29 but not in women with a BMI >29 (moderate quality evidence).

Consensus-based recommendations

At every antenatal visit, offer women the opportunity to be weighed and encourage self-monitoring of weight gain.

At every antenatal visit, discuss weight change, diet and level of physical activity with all women.

4.3 Gestational age assessment (reviewed 2010)

NICE recommendations

Pregnant women should be offered an early ultrasound scan between 10 weeks 0 days and 13 weeks 6 days to determine gestational age and to detect multiple pregnancies. This will ensure consistency of gestational age assessment and reduce the incidence of induction of labour for prolonged pregnancy. [not graded]

Crown-rump length measurement should be used to determine gestational age. If the crown-rump length is above 84 mm, the gestational age should be estimated using head circumference. [not graded]
Research questions

• What is the most accurate method to arrive at an agreed due date (eg last menstrual period [LMP], crown-rump length [CRL], biparietal diameter [BPD])? (Informed Recommendation)

• Which women should be offered a dating scan? (Informed Recommendation)

• When is the best time to conduct a dating scan? (Informed Recommendation)

• What is the cost effectiveness of offering women a dating scan? (Cost analysis undertaken)

• Is it feasible to offer all women a dating scan? (Cost analysis undertaken)

• What are the other potential benefits of a first trimester scan? (No new evidence found)

• Who should conduct a dating scan? (No studies identified)

• What are the potential harms caused by a dating scan? (Limited evidence identified)

• What are the issues of access to dating scans for rural and remote woman? (No studies identified)

• What are the issues for some women if unable to get accurate measurements abdominally especially if male sonographer? (No studies identified)

• Are dating scans done by occasional operator accurate? (No studies identified)

• What are the risks of induction if dates not accurate? (Beyond scope)

• Are there risks that placenta praevia is over-diagnosed in early ultrasound scans, and if so, does this contribute to elevated anxiety? (No studies identified)

• What are the additional considerations for Indigenous Australian women? (Informed narrative)

• What are the cost implications of a dating scan in remote areas? (Informed narrative)

Search strategy

Databases searched: Medline; Embase; Psychinfo; Cochrane Database of systematic Reviews; Australasian Medical Index.

Date of searches: March 2009; November 2010

Limits: English language

Publication dates for searches: January 2007 onwards (January 2000 onwards in Australian databases); January 2008-12 November 2010

Evidence statement

The review identified a systematic review and a number of lower level studies that support the NICE recommendation. Economic analysis was undertaken to assess the cost implications of recommending routine ultrasound in the first trimester (see separate document subtitled Economic Analyses).

EAC recommendation

Provide information and offer pregnant women who are unsure of their conception date an ultrasound between 8 weeks 0 days and 13 weeks 6 days to determine gestational age, detect multiple pregnancies and accurately time fetal anomaly screening.

Use crown-rump length (CRL) measurement to determine gestational age. If the CRL is above 84 mm, estimate the gestational age using head circumference.

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<th>Evidence base</th>
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Evidence supporting recommendation (see Section 20.4)

4.4 Fetal development and anatomy

**NICE recommendation**

Ultrasound screening for fetal anomalies should be routinely offered, normally between 18 weeks 0 days and 20 weeks 6 days.

**Research questions**

- What is the diagnostic value and effectiveness of performing the 18-20 week ultrasound scan? [Informed Recommendation]
- What are the additional needs of population specific groups? [Informed narrative]

**Search strategy**

Date of search: December 2011

Publication date range: 2003-2011

Databases searched: Medline, Embase, Cinahl.

Number of references included: 27

Date of top-up search: 9 January 2013

**Review findings**

The 18–20 week ultrasound scan is effective in assessing growth, detecting fetal anomalies and identifying placental location.

**EAC recommendation**

Offer pregnant women ultrasound screening to assess fetal development and anatomy between 18 and 20 weeks gestation.

**Evidence grading**

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**Supporting evidence** (see Section 21.7)


**Implications for implementation**

The EAC noted that the recommendation would not change usual care but has resource implications (e.g., additional costs in providing ultrasound screening for women in rural and remote areas), may change the way care is organised (e.g., to ensure women receive screening in the recommended timeframe) and that there are barriers to implementation (e.g., access).

Opportunities for training and credentialing of staff who work in remote settings to enable them to undertake the ultrasound could be explored. Alternatively, it may be feasible to establish and/or support mobile ultrasound services in remote areas where the population volume is sufficient.
### 4.5 Fetal growth restriction and wellbeing (reviewed 2016)

#### Fetal growth

No searches were conducted for this topic as it was agreed that the recommendations from *The Investigation and Management of the Small-For Gestational Age Fetus: Green-Top Guideline 31* (RCOG 2014) be used.

#### Research questions

- What is the predictive and diagnostic accuracy of performing abdominal palpation for determining fetal growth and wellbeing? (Informed consensus-based recommendation)
- What are the benefits and risks of performing an abdominal palpation at each antenatal visit? (Informed consensus-based recommendation)
- At what gestation is abdominal palpation effective and/or accurate? (No evidence identified)
- Do customised fundal height charts improve the detection of fetal growth restriction? (Informed narrative)
- What do women need to know in order to prevent fetal growth restriction and/or to lessen its impact; and when is this information needed? (Informed narrative and consensus-based recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No corresponding RCOG question)

#### Consensus-based recommendations

When women are identified as being at risk of having a small-for-gestational age fetus/newborn, provide advice about modifiable risk factors.

Refer women who have a major risk factor or multiple other factors associated with having a small-for-gestational age fetus/newborn for ultrasound assessment of fetal size and assessment of wellbeing at 28–30 and 34–36 weeks gestation.

Do not assess fetal growth based solely on abdominal palpation.

At each antenatal visit from 24 weeks, measure symphysis-fundal height in centimetres.

#### Implications for implementation

The EAC noted that access to ultrasound may be problematic as many of the risk factors for small for gestational age are prevalent among women who live in rural and remote areas or who do not readily access care.

#### Fetal movements

No searches were conducted for this topic as it was agreed that the recommendations from *Clinical Practice Guidelines for Women Who Report Reduced Fetal Movements* be used.

#### Research questions

- What is considered to be a normal fetal movement pattern? (Informed narrative)
- What is the diagnostic accuracy of using a fetal kick chart? (Informed consensus-based recommendation)
- What advice should be provided to women who report a change in fetal movement pattern? (Informed consensus-based recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No corresponding question)

#### Consensus-based recommendations

Early in pregnancy provide women with verbal and written information about normal fetal movements. This information should include a description of the changing patterns of movement as the fetus develops, normal wake/sleep cycles and factors that may modify the mother’s perception of fetal movements.

Advise women with a concern about decreased fetal movements to contact their health care professional immediately.

Do not advise the use of kick charts as part of routine antenatal care.

#### Implications for implementation

No implications associated with implementation of the recommendations were identified.
### 4.6 Fetal heart rate (reviewed 2013)

**NICE recommendations**

Auscultation of the fetal heart may confirm that the fetus is alive but is unlikely to have any predictive value and routine listening is therefore not recommended. However, when requested by the mother, auscultation of the fetal heart may provide reassurance. [D]

The evidence does not support the routine use of antenatal electronic fetal heart rate monitoring (cardiotocography) for fetal assessment in women with an uncomplicated pregnancy and therefore it should not be offered. [A]

**Research questions**

- What is the definition of routine auscultation? [No evidence identified]
- What is the predictive and diagnostic accuracy of performing auscultations? [Informed narrative]
- When is it appropriate to perform routine auscultation? [Informed narrative]

**Search dates**

2013 to May 2016

**Search strategies**

- Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl
- Limits: English language
- Date of search: 16 August 2012
- Publication date range: 2003-2011
- Search terms/key words: Auscultation, heart, fetal, pregnancy, antenatal, prenatal, pregnancy, disease, cardiotoco*, CTG
- Number of references included: 3
- Date of top-up search: 15 January 2013 (no additional references)

**Review findings**

There is insufficient evidence to support recommendations on fetal heart rate monitoring.

**Consensus-based recommendations**

- If auscultation of the fetal heart rate is performed, a Doppler may be used from 12 weeks and either Doppler or a Pinard stethoscope from 28 weeks.
- Do not routinely use electronic fetal heart rate monitoring (cardiotocography) for fetal assessment in women with an uncomplicated pregnancy.

**Implications for implementation**

No implications associated with implementation of the recommendations were identified.
## 4.7 Risk of preterm birth (reviewed 2016)

### Research questions

- What is the definition of preterm labour? (No specific evidence identified)
- What is the prevalence and incidence of preterm labour? (Informed narrative)
- What are the risk factors for developing preterm labour? (Informed narrative and consensus-based recommendation)
- What advice should be provided to women who are at risk of developing preterm labour? (Informed narrative)
- Should cervical length be routinely measured as part of 17-22 week ultrasound assessment? (Informed narrative)
- What holistic preventative strategies including models of maternity care, reduce the incidence and impact of premature labour and birth? (Informed narrative and consensus-based recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)

### Search dates

2013 to January 2017

### Outcomes analysed

Preterm birth (<37 wk), very preterm birth (<32 wk), low birth weight, admission to neonatal intensive care, perinatal death

### Consensus-based recommendation

When women are identified as being at risk of giving birth preterm based on the presence of risk factors, provide advice about modifiable risk factors.

### Implications for implementation

No implications associated with implementation of the recommendation were identified.

## 4.8 Cervical length measurement to assess risk of preterm birth (reviewed 2018)

### Research questions

#### Harms and benefits

- Q1: What are the harms and benefits of measuring women’s cervical length at the 20 week ultrasound?
- Q2: Should measuring of cervical length be restricted to women with risk factors for preterm birth?
- Q3: Should women’s cervical length be measured via transabdominal or transvaginal ultrasound?
- Q4: At what point/s in pregnancy should cervical length measuring/screening be undertaken in women who are at risk of preterm birth due to the presence of risk factors?

#### Interventions

- Q5: What is the efficacy of progesterone in preventing preterm birth in women who are at risk of preterm birth due to short cervical length?

#### Additional considerations

- Q6: What are the additional needs of Aboriginal and Torres Strait Islander women?
- Q7: What are the additional considerations for migrant and refugee women?

### Search strategy

- Publication date range: 2008 to January 2018
- Databases searched: Embase, Cinahl, Scopus, Cochrane, Australian Indigenous HealthInfoNet

### Outcomes analysed

Perinatal mortality, preterm birth <37 weeks, preterm birth <34 weeks, birth weight <2,500 g, respiratory distress syndrome
Evidence statements

- Evidence from systematic reviews of observational studies and subsequent observational studies suggests that cervical length measurement at the 18-20 week ultrasound using a threshold of 25 mm has the potential to predict preterm birth but is more accurate when combined with an assessment of relevant maternal factors. No evidence of harms associated with cervical length measurement was identified.

- Observational and cost-effectiveness studies suggest that universal measurement of cervical length and treatment with vaginal progesterone for women with a short cervix (≤25 mm) at 18-25 weeks reduces the risk of preterm birth and is cost-effective (in the United States and the United Kingdom). No Australian cost-effectiveness studies were identified.

- Evidence from observational studies suggests that initial transabdominal measurement of cervical length may represent a useful strategy for detecting women with short cervix on transvaginal ultrasound. However, the evidence is inconsistent in terms of gestational age and cut-offs and a cost-effectiveness study found that universal transvaginal ultrasound was more cost-effective than including an initial transabdominal measurement.

- Evidence from observational studies suggests that cervical length measurement earlier than 20 weeks may predict cervical shortening and risk of early preterm birth in women at high risk of preterm birth. However, a cervical length >25 mm does not preclude preterm birth in this group of women.

- Evidence from systematic reviews of RCTs and subsequent RCTs suggest that vaginal progesterone reduces the risk of preterm birth (<35 weeks) in women with a short cervix identified on ultrasound at 18-25 weeks (moderate certainty).

- No studies on the additional needs of Aboriginal and Torres Strait Islander women or migrant and refugee were identified or on women who require an interpreter to explain the transvaginal approach. However, issues of access to ultrasound services (eg due to remote location or language barriers) and availability of accredited trained professionals in some areas may limit the availability of cervical measurement for some women.

Consensus-based recommendation

If a woman’s cervical length is measured at the 18-20 week ultrasound and is ≤25 mm, assess other risk factors for preterm birth and seek expert advice if her risk of preterm birth appears to be high.

Harms and health benefits associated with the recommendation

Harms: No evidence of harms associated with cervical length measurement was identified.

Health benefits: Women identified as at high risk of preterm birth can be given advice on modifiable risk factors.

Implications for implementation

This recommendation may lead to an increase in referral of women at high risk of preterm birth to specialist care.

4.9 Blood pressure (reviewed 2011)

NICE recommendations

At the booking appointment, the following risk factors for pre-eclampsia should be determined:

- age 40 years or older
- nulliparity
- pregnancy interval of more than 10 years
- family history of pre-eclampsia
- previous history of pre-eclampsia
- body mass index 30 kg/m² or above
- pre-existing vascular disease such as hypertension
- pre-existing renal disease
- multiple pregnancy.
Blood pressure measurement and urinalysis for protein should be carried out at each antenatal visit to screen for pre-eclampsia. More frequent blood pressure measurements should be considered for pregnant women who have any of the above risk factors.

The presence of significant hypertension and/or proteinuria should alert the healthcare professional to the need for increased surveillance.

Hypertension in which there is a single diastolic blood pressure of 110 mmHg or two consecutive readings of 90 mmHg at least 4 hours apart and/or significant proteinuria (1+) should prompt increased surveillance.

If the systolic blood pressure is above 160 mmHg on two consecutive readings at least 4 hours apart, treatment should be considered.

**Research questions**

- When should blood pressure be monitored in the first trimester of pregnancy? (Informed Recommendation)
- How is blood pressure monitored in pregnancy? (Beyond scope)
- What is the diagnostic test accuracy of measuring diastolic and systolic blood pressure, and mean arterial pressure in pregnancy and the significance of an increase of 15mmHg from baseline? (Informed narrative)
- What would be the benefits or harms of intervention strategies? (Specific to pre-eclampsia)
- What pre-existing medical conditions affect blood pressure in the first trimester of pregnancy? (Informed narrative)
- What is the psychological impact of hypertension screening? (Informed narrative)
- What are the additional needs of Aboriginal and Torres Strait Islander women? (No evidence identified)

**Search strategy**

Databases searched: Medline; Embase; Cochrane Database of systematic Reviews.

Date of searches: December 2010; March 2011

Limits: English language


**Review findings**

There is minimal low level evidence on how or when to take blood pressures in the first trimester and none to refute the NICE 2003 recommendations.

The 2 level IV studies identified informed the narrative but did not alter the NICE recommendations.

The 2 level II, 6 level III-2, 4 level III-3 and 1 level IV studies identified reported conflicting results on the accuracy of blood pressure measurement in predicting pre-eclampsia. However, the presence of risk factors and/or blood pressure recordings raised above the norm during the first trimester are inextricably linked with later pregnancy pre-eclampsia (as well as pre-existing conditions, see 5 below) and should not be overlooked.

There is insufficient new evidence to justify changing the NICE recommendations.

**EAC recommendation**

Measure blood pressure at a woman’s first antenatal visit to identify existing high blood pressure.

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**Evidence supporting recommendation (see Section 24.5)**

4.10 Proteinuria (reviewed 2010)

NICE recommendations

NICE did not cover proteinuria as a separate topic in 2003 or the 2008 update. All NICE references have been extracted from chapters on hypertensive disorders of pregnancy and/or pre-eclampsia.

Whenever blood pressure is measured in pregnancy, a urine sample should be tested at the same time for proteinuria. Research is needed to determine the optimal frequency and timing of blood pressure measurement and on the role of screening for proteinuria.

Use an automated reagent-strip reading device or a spot urinary protein:creatinine ratio for estimating proteinuria in a secondary care setting.

Research questions

• What is the diagnostic test accuracy for proteinuria testing in the first trimester? (Informed Recommendation)
• What would be the benefits or harms of testing for proteinuria in the first trimester? (No studies identified)
• How is testing for proteinuria in the first trimester predictive of later pregnancy complications? (Informed narrative)

Search strategy

Databases searched: Medline; Embase; Psychinfo; Cochrane Database of Systematic Reviews, Australasian Medical Index.

Date of search: December 2010

Limits: English language

Publication dates for search: January 2003 - December 2010

Review findings

The 1 level I study, 9 level III-2 studies, 3 level III-3 and 4 level IV studies identified found urine collection tests, protein:creatinine ratio and automated dipstick analysis to be more accurate that visual inspection of urinary dipsticks.

Two level II studies, 1 level III-2 study, 1 level III-3 study and 3 level IV studies suggest that proteinuria in the first trimester does not predict pre-eclampsia and subsequent testing should be confined to those with other risk factors such as existing or newly diagnosed hypertension, new or pre-existing kidney disease.

EAC recommendation

For point-of-care testing, use an automated analyser if available, as visual inspection of a urinary dipstick is the least accurate method to detect true proteinuria.

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Evidence supporting recommendation (see Section 25.6)


Consensus-based recommendation

Routinely offer testing for proteinuria at the first antenatal visit, regardless of stage of pregnancy.
4.11 Risk of pre-eclampsia (reviewed 2013)

**NICE recommendations**

Pregnant women should be made aware of the need to seek immediate advice from a healthcare professional if they experience symptoms of pre-eclampsia.

Advise women at high risk of pre-eclampsia to take 75 mg of aspirin daily from 12 weeks until the birth of the baby. Women at high risk are those with any of the following: hypertensive disease during a previous pregnancy; chronic kidney disease; autoimmune disease such as systemic lupus erythematosis or antiphospholipid syndrome; type 1 or type 2 diabetes; chronic hypertension.

Advise women with more than one moderate risk factor for pre-eclampsia to take 75 mg of aspirin daily from 12 weeks until the birth of the baby. Factors indicating moderate risk are first pregnancy; age 40 years or older; pregnancy interval of more than 10 years; body mass index (BMI) of 35 kg/m² or more at first visit; family history of pre-eclampsia; multiple pregnancy.

Whenever blood pressure is measured in pregnancy, a urine sample should be tested for proteinuria. [C]

**Research questions**

- What is the prevalence and incidence of pre-eclampsia, including population specific groups? [Informed narrative]
- What are the risk factors for developing pre-eclampsia? [Informed narrative]
- What is the predictive and diagnostic test accuracy of screening for pre-eclampsia? [Informed narrative]
- What are the harms of not screening for pre-eclampsia? [Informed narrative]
- What are the maternal and/or fetal benefits of screening for pre-eclampsia? [Informed narrative]
- When in pregnancy should screening for pre-eclampsia be carried out? [No evidence identified]
- What advice should women receive who are at risk of developing pre-eclampsia? [Informed Recommendations]
- Should every woman be tested for proteinuria at every antenatal visit if blood pressure remains normal? [Informed Recommendation]

**Search strategy**

Databases searched: Medline, Embase, Cinahl
Date of search: 16 September 2012
Publication date range: 2003-2011
Number of references included: 71
Date of search for additional question (Q8): 8 May 2012
Search terms: proteinuria, preg*, antenatal, blood pressure, routine, normotensive, urinalysis
Number of additional references included: 2
Date of top-up search: 4 January 2013
Number of additional references included: 21

**Review findings**

Calcium supplementation reduces the risk of pre-eclampsia among women at risk if dietary intake is low.

Risk of pre-eclampsia among women at risk is reduced by low-dose aspirin from early in pregnancy.

Antioxidants (vitamins C and E) are not of benefit in preventing pre-eclampsia.

Routine testing for proteinuria is not helpful in predicting pre-eclampsia and should be confined to women with increased blood pressure or acute weight gain.

**Consensus-based recommendation**

Routinely measure blood pressure to identify new onset hypertension.
### EAC recommendation

Advise women at high risk of developing pre-eclampsia that calcium supplementation is beneficial if dietary intake is low.

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Supporting evidence (see Section 26.6)

Hofmeyr et al 2010; Patrelli et al 2012

Implications for implementation

No implications associated with implementation of the recommendation were identified.

### EAC recommendation

Advise women at moderate-high risk of pre-eclampsia that low-dose aspirin from early pregnancy may be of benefit in its prevention.

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Supporting evidence (see Section 26.6)

Duley et al 2007; Bujold et al 2010; Trivedi 2011; Roberge et al 2012

Implications for implementation

No implications associated with implementation of the recommendation were identified.

### EAC recommendation

Advise women that vitamins C and E are not of benefit in preventing pre-eclampsia.

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<th>Evidence base</th>
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Supporting evidence (see Section 26.6)


Implications for implementation

No implications associated with implementation of the recommendation were identified.
## 4.12 Risk of pre-eclampsia (reviewed 2016)

### Research questions

- What is the prevalence and incidence of pre-eclampsia, including population specific groups? (Informed narrative)
- What are the risk factors for developing pre-eclampsia? (Informed evidence-based recommendation)
- What is the predictive and diagnostic test accuracy of screening for pre-eclampsia? (Informed narrative)
- What are the harms of not screening for pre-eclampsia? (No studies identified)
- What are the maternal and/or fetal benefits of screening for pre-eclampsia? (Informed narrative)
- When in pregnancy should screening be carried out? (Informed narrative)
- What are the benefits and risks of the predictive tests (e.g., PAPP-A) to identify women at risk of pre-eclampsia? (Informed narrative)
- Should every woman be tested for proteinuria at every antenatal visit if blood pressure remains normal? (No studies identified)
- What advice should women who are at risk of developing pre-eclampsia receive? (Informed narrative)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No studies identified)

### Search dates

2012 to December 2016

### Outcomes analysed

Early onset pre-eclampsia (<34 wks), late onset pre-eclampsia (≥34 weeks), any pre-eclampsia

### Evidence statements

There is an established association between increased risk of pre-eclampsia in the current pregnancy and history of pre-eclampsia, chronic hypertension, pre-existing diabetes, chronic kidney disease, autoimmune disease (systemic lupus erythematosus, antiphospholipid syndrome), BMI >30 or nulliparity (low to high quality evidence).

### Evidence-based recommendation

Early in pregnancy, assess all women for clinical risk factors for pre-eclampsia.

### References (see Section 26.6)

Level I: Bartsch et al 2016

### Implications for implementation

No implications associated with implementation of the recommendation were identified as, while prevalence is low, the risk factors for pre-eclampsia are routinely assessed as part of comprehensive history taking and clinical assessment previously recommended as routine components of the first antenatal visit.

### Consensus-based recommendation

Recommend testing for proteinuria at each antenatal visit if a woman has risk factors for or clinical indications of pre-eclampsia, in particular, raised blood pressure.

### Implications for implementation

No implications associated with implementation of the recommendation were identified.
## 5 Social and emotional screening

### 5.1 Screening for depressive and anxiety disorders (reviewed 2016)

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<th>Recommendation</th>
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<tr>
<td>Use the Edinburgh Postnatal Depression Scale (EPDS) to screen women for a possible depressive disorder.</td>
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**References (see Section 27.5)**

(NICE 2015)

**Implications for implementation**

The use of the EPDS in the antenatal period was recommended in the previous perinatal mental health guideline. It is hoped that this recommendation will continue to increase rates of screening, which may have implications for services providing further assessment or treatment in primary care settings, while potentially reducing the severity of disorders (through early identification) and hence need for medical/specialist care. The EPDS is a free tool for use in clinical and research settings.

It is also recommended that there is an expansion of the Medicare item number 16590 to further support screening to be undertaken by general practitioners and specialist services (obstetricians). This will support screening in line with best practice; particularly in the private sector where screening rates are significantly lower (when compared with the public maternity sector).

**Evidence statement: screening tool cut-off**

A score of 13 or more on the EPDS has moderate sensitivity and high specificity for detecting possible major depression in pregnant women (high quality evidence).

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<th>Recommendation</th>
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<tr>
<td>Arrange further assessment of woman with an EPDS score of 13 or more</td>
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**References (see Section 27.5)**

(NICE 2015)

**Implications for implementation**

The availability of the EPDS in many languages currently (some validated and some invalidated) supports the use of the EPDS for women of non-English speaking backgrounds. Translated versions of EPDS are free for use in clinical and research settings, and permission granted by the Guideline developer to use for e-screening. In addition, the Guideline developer has translated the EPDS into other languages not previously available and has permission to make these available in electronic formats.

**Consensus-based recommendations**

- Conduct screening as early as practical in pregnancy and repeat at least once later in pregnancy.
- For a woman with an EPDS score between 10 and 12, monitor and repeat the EPDS in 4-6 weeks as her score may increase subsequently.
- Repeat the EPDS at any time in pregnancy if clinically indicated.
- For a woman with a positive score on Question 10 on the EPDS, undertake or arrange immediate further assessment and, if there is any disclosure of suicidal ideation, take urgent action in accordance with local protocol/policy.
- When screening Aboriginal and Torres Strait Islander women, consider language and cultural appropriateness of the tool.
- Use appropriately translated versions of the EPDS with culturally relevant cut-off scores.
- Be aware that anxiety disorder is very common in the perinatal period and should be considered in the broader clinical assessment.
As part of the clinical assessment, use anxiety items from other screening tools (eg EPDS items 3, 4 and 5); Depression Anxiety Stress Scale anxiety items and Kessler Psychological Distress Scale items 2, 3, 5 and 6) and relevant items in structured psychosocial assessment tools (eg the Antenatal Risk Questionnaire [ANRQ]).

Be aware that anxiety disorder is very common in the perinatal period and should be considered in the broader clinical assessment.

As part of the clinical assessment, use anxiety items from other screening tools (eg EPDS items 3, 4 and 5; Depression Anxiety Stress Scale anxiety items; and Kessler Psychological Distress Scale items 2, 3, 5 and 6) and relevant items in structured psychosocial assessment tools (eg the Antenatal Risk Questionnaire [ANRQ]).

Implications for implementation

No implications associated with implementation of the recommendation were identified.

5.2 Assessing psychosocial factors that affect mental health (reviewed 2016)

Research question

What is the most appropriate method for psychosocial assessment of women at risk of mental health problems in the perinatal period?

Evidence statements

The Antenatal Psychosocial Health Assessment is effective at identifying family violence (moderate quality evidence).

The ANRQ is effective at predicting cases of depression (moderate quality evidence).

The Pregnancy Risk Questionnaire is effective at predicting cases of depression (moderate quality evidence).

Recommendation

If using a tool to assess psychosocial risk, administer the ANRQ. Strong

References (see Section 28.5)

(Austin et al 2005; Carroll et al 2005; Austin et al 2013; Reilly et al 2015)

Implications for implementation

The ANRQ is a free tool for use in clinical and research settings (request from m.austin@unsw.edu.au), and permission has been granted by its authors (Austin et al 2013) for the Guideline developer (Centre of Perinatal Excellence) to use for e-screening. It forms part of the Mummatters online tool, which can be downloaded via the internet. Mummatters is designed for pregnant and postnatal women to self-assess and track their emotional wellbeing.

Consensus-based recommendation

Undertake psychosocial assessment in conjunction with a tool that screens for current symptoms of depression/anxiety (eg the EPDS).

Consider language and cultural appropriateness of any tool used to assess psychosocial risk.

Implications for implementation

No implications associated with implementation of the recommendation were identified.
## 5.3 Family violence (reviewed 2016)

### Research questions

- What do health professionals need to do to identify women at risk from domestic violence? (Informed evidence-based recommendation)
- Should specific questions be asked as part of the process of routine enquiry? (Informed consensus-based recommendation)
- Are there validated screening tests for domestic violence that would be applicable to Australian maternity practice? (Informed consensus-based recommendation)
- Is routine enquiry about domestic violence acceptable to women? (Informed narrative)
- Is routine enquiry about domestic violence acceptable to health professionals? (Informed narrative)
- What do health professionals need to do to identify Aboriginal and Torres Strait Islander women experiencing domestic violence? (No evidence identified)
- Is routine enquiry about domestic violence acceptable to Aboriginal and Torres Strait Islander women? (No evidence identified)
- Is routine enquiry about domestic violence acceptable to health professionals caring for Aboriginal and Torres Strait Islander women? (No evidence identified)
- What interventions in a health care setting are effective for assisting women affected by domestic violence? Informed narrative
- What interventions in a health care setting are effective for assisting Aboriginal and Torres Strait Islander women affected by domestic violence? (No evidence identified)
- What interventions can be used to reduce the further incidence and impact of domestic violence for a woman who has disclosed she is in a violent relationship or has recently left a violent relationship? (Informed narrative)
- How can antenatal care providers enhance the immediate safety of women in or at risk of violence? (Informed narrative)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)
- What are the additional considerations for women from culturally and linguistically diverse groups? (Informed narrative)

### Search dates

2008 to July 2016

### Outcomes analysed

Identification of family violence, referral, physical abuse, emotional abuse, sexual abuse and coercion, safety planning, low birth weight

### Evidence statements

**Universal screening for domestic violence versus usual care**

Identification of domestic violence in any health care setting and in antenatal clinics was higher when women were universally screened than with usual care (moderate quality evidence).

There was no evidence for an effect on referrals (low quality evidence).

**Face-to-face screening versus written/computer-based screening for domestic violence**

There was no significant difference in identification of domestic violence between the two approaches (moderate quality evidence).
Any intervention to prevent violence versus standard care for preventing or reducing domestic violence against pregnant women

The total number of episodes of partner abuse in pregnancy and up to 10 weeks postpartum is lower among women who receive a psychological intervention than among controls (moderate quality evidence).

The difference in risk of having a low birthweight baby between women participating in a psychological intervention and controls not did not reach significance (low quality evidence).

The difference in risk of episodes of partner abuse during pregnancy and in the first 3 months postpartum between women participating in a psychological intervention and controls did not reach significance (very low quality evidence).

Women who participate in an empowerment intervention are more likely to adopt safety behaviours than controls (very low quality evidence).

The evidence on partner abuse scores was inconsistent and differences between groups did not reach significance.

Advocacy interventions for women who experience intimate partner abuse versus usual care at up to 12-month follow-up

The difference in overall abuse immediately post-intervention between women participating in intensive advocacy interventions and controls did not reach significance (very low quality evidence).

Brief advocacy interventions for women experiencing domestic violence have no clear effect on physical abuse, minimal effect on sexual abuse and may have a beneficial effect on emotional abuse at 16 to 34 weeks follow-up and on overall abuse at 3-4 months follow-up (low to moderate quality evidence).

Evidence-based recommendation

| Explain to all women that asking about family violence is a routine part of antenatal care and enquire about each woman’s exposure to family violence. |

References (see Section 29.5)

O’Doherty et al 2015

Implications for implementation

No implications associated with implementation of the recommendation were identified as the recommendation is consistent with the recommendation made in Module 1 (Australian Health Ministers’ Advisory Council 2012), with the exception that ‘at the first antenatal visit’ has been removed in acknowledgement of the facts that the time available at this visit and the number of assessments required may limit opportunities for enquiry about family violence and that women may be more inclined to disclose once more familiar with the enquiring health professional. However, it is noted that providing interventions in response to disclosure of family violence requires investment of time, funds and training.

Consensus-based recommendation

| Ask about family violence only when alone with the woman, using specific questions or the tool used in your state/territory. |

Undertake and encourage regular and repeat training of health professionals, as training programs improve confidence and competency in identifying and caring for women experiencing family violence.

Implications for implementation

No implications associated with implementation of the recommendation were identified.
6 Routine maternal health tests

6.1 Anaemia (reviewed 2012)

**NICE recommendations**
Pregnant women should be offered screening for anaemia. Screening should take place early in pregnancy (at the first appointment) and at 28 weeks, when other blood screening tests are being performed. This allows enough time for treatment if anaemia is detected. [B]

Haemoglobin levels outside the normal UK range for pregnancy (that is, 11 g/dl at first contact and 10.5 g/dl at 28 weeks) should be investigated and iron supplementation considered if indicated. [A]

**Research questions**
What is the prevalence and incidence of anaemia, including population specific groups? [Informed narrative]
What are the risk factors for developing anaemia? [Informed narrative]
What is the diagnostic test accuracy of screening for anaemia? [No evidence identified]
What are the maternal and/or fetal benefits and risks of screening for anaemia? [No evidence identified]
When in pregnancy should screening for anaemia be carried out? [No evidence identified]
What advice should be provided to women to prevent developing anaemia in pregnancy? [Informed narrative on iron as a nutritional supplement]
What interventions or treatments for anaemia are effective and safe in pregnancy, and what advice should women receive? [Informed Recommendations 19 and 20]

**Search strategy**
Date of search: 30 January 2012
Publication date range: 2003-2012
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 47
Date of top-up search: 20 December 2012
Number of additional references included: 10

**Review findings**
Iron supplementation improves maternal haemoglobin concentrations.
Oral iron supplements that are low dose or taken less often than daily appear to be effective in treating anaemia in pregnancy with fewer gastrointestinal side effects compared with high-dose or daily supplements.

**EAC recommendation**
Advise iron supplementation for women identified as having iron-deficiency anaemia.

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**Evidence supporting recommendation** (see Section 30.7)
Reveiz et al 2011

**Implications for implementation**
The EAC noted that there may be resource implications associated with the recommendation (eg women will need to be advised to purchase supplements), which may act as a barrier to implementation. However, iron supplementation is probably already advised in many settings.
EAC recommendation

Advise women with iron-deficiency anaemia that low-dose iron supplementation is as effective as high dose, with fewer side effects.

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Evidence supporting recommendation (see Section 30.7)

de Souza et al 2004; Sharma et al 2004; Zhou et al 2009; Reveiz et al 2011

Implications for implementation

The EAC noted that the recommendation would lead to changes in usual care (eg some women may have been on a higher dose than necessary), has resource implications (eg women will need to purchase supplements but low-dose may be less expensive than high-dose supplements) and that there are barriers to implementation (eg preference for existing practices), which could be addressed through changes in organisational protocols.

Consensus-based recommendation

Routinely offer testing for haemoglobin concentration to pregnant women early in pregnancy (at the first visit) and at 28 weeks gestation.

6.2 Haemoglobin disorders (reviewed 2012)

NICE recommendations

Preconception counselling (supportive listening, advice giving and information) and carrier testing should be available to all women who are identified as being at higher risk of haemoglobinopathies, using the Family Origin Questionnaire from the NHS Antenatal and Newborn Screening Programme.

Information about screening for sickle cell diseases and thalassaemias, including carrier status and the implications of these, should be given to pregnant women at the first contact with a healthcare professional.

Screening for sickle cell diseases and thalassaemias should be offered to all women as early as possible in pregnancy (ideally by 10 weeks). The type of screening depends upon the prevalence and can be carried out in either primary or secondary care.

Where prevalence of sickle cell disease is high (fetal prevalence above 1.5 cases per 10,000 pregnancies), laboratory screening (preferably high-performance liquid chromatography) should be offered to all pregnant women to identify carriers of sickle cell disease and/or thalassaemia.

Where prevalence of sickle cell disease is low (fetal prevalence 1.5 cases per 10,000 pregnancies or below), all pregnant women should be offered screening for haemoglobinopathies using the Family Origin Questionnaire.

If the woman is identified as a carrier of a clinically significant haemoglobinopathy then the father of the baby should be offered counselling and appropriate screening without delay.

Research questions

- What is the prevalence and incidence of haemoglobinopathies among pregnant women, including in population specific groups? [Informed narrative]
- What is the diagnostic test accuracy of screening for haemoglobinopathies in pregnancy? [Informed narrative]
- When should women be screened for haemoglobinopathies in pregnancy? [Informed narrative]
- What are the benefits and risks of screening for haemoglobinopathies in pregnancy? [Informed narrative]
- What is the cost effectiveness of universal screening for haemoglobinopathies in pregnancy? [Informed narrative]
- What advice should women receive who have haemoglobinopathies in pregnancy? [Informed narrative]
### Search strategy

Date of search: 4 July 2012
Publication date range: 2003–2012
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 27
Date of top-up search: 7 November 2012
Number of additional references included: 3

### Review findings

There is insufficient evidence to support a recommendation on screening for haemoglobin disorders.

### Consensus-based recommendation

As early as possible in pregnancy, routinely provide information about haemoglobin disorders and offer testing (full blood count).

### 6.3 Hyperglycaemia (reviewed 2013)

#### NICE recommendations

Screening for gestational diabetes using risk factors is recommended in a healthy population.

At the booking appointment, the following risk factors for gestational diabetes should be determined: body mass index above 30 kg/m², previous macrosomic baby weighing 4.5 kg or above, previous gestational diabetes (refer to 'Diabetes in pregnancy' [NICE clinical guideline 63], available from [Link to NICE website]), family history of diabetes (first-degree relative with diabetes), family origin with a high prevalence of diabetes (South Asian [specifically women whose country of family origin is India, Pakistan or Bangladesh], black Caribbean, Middle Eastern [specifically women whose country of family origin is Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon or Egypt]). [Ungraded]

Women with any one of these risk factors should be offered testing for gestational diabetes (refer to Diabetes in pregnancy' [NICE clinical guideline 63], available from www.nice.org.uk/CG063). [Ungraded]

In order to make an informed decision about screening and testing for gestational diabetes, women should be informed that: in most women, gestational diabetes will respond to changes in diet and exercise; some women (between 10% and 20%) will need oral hypoglycaemic agents or insulin therapy if diet and exercise are not effective in controlling gestational diabetes; if gestational diabetes is not detected and controlled there is a small risk of birth complications such as shoulder dystocia; a diagnosis of gestational diabetes may lead to increased monitoring and interventions during both pregnancy and labour. [Ungraded]

Screening for gestational diabetes using fasting plasma glucose, random blood glucose, glucose challenge test and urinalysis for glucose should not be undertaken. [Ungraded]

#### Research questions

- Who should be screened for hyperglycaemia in pregnancy? [Informed narrative]
- Should all women less than 20 weeks gestation be offered glycated haemoglobin (HbA1c) to diagnose type 2 diabetes? [No direct evidence identified]
- What thresholds should be used to diagnose type 2 diabetes in pregnant women less than 20 weeks gestation? [No direct evidence identified]
- What risk factors are associated with increased risk of gestational diabetes? [Informed Recommendation]
- How effective are lifestyle interventions for prevention of gestational diabetes (pre-conception and during pregnancy)? [Informed Recommendation]
- What is the optimal diagnostic threshold for diagnosing gestational diabetes? [Insufficient evidence identified]
- Which screening/diagnostic regimen is optimal for maternal and infant outcomes? [Insufficient evidence identified]
What is the cost effectiveness of commonly using screening/diagnostic strategies? [Informed narrative]

What is the prevalence and incidence of gestational diabetes, including population specific groups? [Informed narrative]

What advice should be provided to women to prevent developing gestational diabetes in pregnancy? [Informed narrative]

Review strategy
A full text assessment of evidence identified for the New Zealand Ministry of Health clinical guidelines for the diagnosis, treatment and management of gestational diabetes in New Zealand was conducted in November-December 2013.

Number of references included: 102

Review findings
There is a considerable body of evidence to support an independent association between risk of gestational diabetes and a range of factors (see Recommendation 21).

There is good evidence that combined physical activity and healthy eating reduce excessive weight gain (but do not directly reduce the risk of gestational diabetes).

There is currently no universally accepted screening or diagnostic regimen for gestational diabetes.

EAC recommendation
In the first trimester, assess a woman’s risk of hyperglycaemia including: her age, body mass index, previous gestational diabetes or high birth weight baby, family history of diabetes, presence of polycystic ovarian syndrome and whether she is from an ethnic group with high prevalence of diabetes, such as Aboriginal and Torres Strait Islander peoples.

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<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
<th>Applicability</th>
<th>Recommendation</th>
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Evidence supporting recommendation (see Section 32.7)


Implications for implementation
No implications associated with implementation of the recommendation were identified.

EAC recommendation
Advise women that physical activity and healthy eating during pregnancy help to reduce excessive weight gain but do not appear to directly reduce the risk of diabetes in pregnancy.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
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Evidence supporting recommendation (see Section 32.7)


Implications for implementation
No implications associated with implementation of the recommendation were identified.
### Consensus-based recommendations

Between 24 and 28 weeks gestation, advise testing for hyperglycaemia to all women who have not previously been tested in the current pregnancy. Advise repeat testing to women who were tested early in pregnancy due to risk factors and had a normal result on an initial test.

Use the World Health Organization/International Association of Diabetes and Pregnancy Study Groups tests and criteria to diagnose diabetes and gestational diabetes in pregnancy.

### 6.4 Early testing for diabetes (reviewed 2016)

**Research questions**

- What is the most appropriate screening test to detect undiagnosed diabetes in early pregnancy? (Informed consensus-based recommendation)
- To whom should it be applied? (Informed narrative)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)
- What are additional considerations for women from culturally and linguistically diverse backgrounds? (Informed narrative)

**Search dates**

2008 to June 2016

**Outcomes analysed**

Perinatal death, major congenital anomalies, preterm birth (<37 wk), pre-eclampsia, induced labour, large for gestation age (>90th centile), macrosomia (>4,000g)

**Evidence statements**

- Outcomes associated with HbA1c 41–46 mmol/mol compared to HbA1c <41 mmol/mol in early pregnancy
- Compared to women with HbA1c <41 mmol/mol in early pregnancy, women with HbA1c 41–46 mmol/mol had a higher risk of perinatal death, major congenital anomalies, preterm birth, pre-eclampsia, induced labour and large for gestational baby and the difference in rates of macrosomia did not reach significance (very low quality evidence).
- Outcomes associated with early treatment compared to later treatment for women with HbA1c 41-49 mmol/mol
- Treatment before 24 weeks was associated with a lower risk of pre-eclampsia than treatment at or after 24 weeks but the differences in other outcomes (perinatal death, preterm birth, induced labour, large for gestation age and macrosomia) did not reach significance (very low quality evidence).

**Consensus-based recommendation**

When a woman has risk factors for hyperglycaemia in the first trimester, suitable tests are glycated haemoglobin (HbA1c) or fasting blood glucose.

### 6.5 Human immunodeficiency virus (reviewed 2010)

**NICE recommendation**

Pregnant women should be offered screening for human immunodeficiency virus (HIV) infection early in antenatal care because appropriate antenatal interventions can reduce mother-to-child transmission of HIV infection. [A]

A system of clear referral paths should be established in each unit or department so that pregnant women who are diagnosed with an HIV infection are managed and treated by the appropriate specialist teams. [D]
### Research questions

- What is the prevalence of HIV infection in pregnant women in Australia? (Informed narrative)
- What is the prevalence of congenitally acquired HIV infection in Australia? (Informed narrative)
- What is the diagnostic accuracy of screening tests for HIV infection? (Informed Recommendation)
- What benefits would result from screening for HIV in pregnancy? (Informed Recommendation)
- What are the harms of not screening for HIV in pregnancy? (Informed Recommendation)
- What are the harms of screening for HIV in pregnancy? (Informed Recommendation)
- What are the additional needs of Aboriginal or Torres Strait Islander women? (Informed narrative)

### Search strategy

Databases searched: Medline; Embase; Australasian Medical Index; ATSihealth; Google Scholar; Cochrane Database

Date of search: November 2010

Limits: English language

Publication dates for search: January 2003 - November 2010

### Review findings

2 level III-2 studies and 1 level IV study used as basis of narrative on Australian prevalence.

1 level III-2 study used as basis for narrative on prevalence of congenital HIV.

3 level III-2 studies support the accuracy of diagnostic tests.

1 level I study, 1 level III-2 study, 1 level IV study and 5 clinical practice guidelines support routine testing of all women in pregnancy due to the availability of effective interventions to prevent mother-to-child transmission.

1 level III-2 study and 1 level IV study identify lack of treatment as a harm arising from not screening.

3 level III-2 studies, 2 level IV studies and 1 clinical practice guideline found no significant harms from antiretroviral therapy during pregnancy.

1 level III-2, 4 level IV and 1 clinical practice guideline informed the narrative. Advice on screening in rural and remote areas also provided by Working Group for Aboriginal and Torres Strait Islander Women’s Antenatal Care.

Current available evidence supports the 2003 NICE recommendations for HIV screening in first trimester of pregnancy.

### EAC recommendation

Routinely offer and recommend HIV testing at the first antenatal visit as effective interventions are available to reduce the risk of mother-to-child transmission.

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Evidence supporting recommendation (see Section 33.7)


### 6.6 Hepatitis B (reviewed 2010)

### NICE recommendation

Serological screening for hepatitis B virus should be offered to pregnant women so that effective postnatal intervention can be offered to infected women to decrease the risk of mother-to-child transmission. [A]

### Research questions

- What are the interventions to reduce mother-to-child transmission of hepatitis B virus? (Informed Recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)
Search strategy

Databases searched: Medline; Embase; Australasian Medical Index; ATSIhealth; Google Scholar; Cochrane Database

Date of search: November 2010

Limits: English language

Publication dates for search: January 2003 - November 2010

Review findings

The 2 level I studies and 3 level IV studies identified support the NICE recommendation. This recommendation is also in accord with United States clinical practice guidelines and the Australian Immunisation Handbook.

EAC recommendation

Routinely offer and recommend hepatitis B virus testing at the first antenatal visit as effective postnatal intervention can reduce the risk of mother-to-child transmission.

Evidence supporting recommendation (see Section 34.5)

Cowan et al 2006; Jensen et al 2003; Lin & Vickery 2009; Summers et al 1987

Grading of evidence: Recommendation 12

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6.7 Hepatitis C (reviewed 2016)

Research questions

- What is the incidence of Hepatitis C in the general Australian child-bearing population (15-45 years)? (Informed narrative)
- What is the diagnostic value and clinical effectiveness of testing for Hepatitis C? (Informed narrative and consensus-based recommendation)
- What is the potential for transmission of Hepatitis C in labour and birth and breastfeeding? (Informed narrative)
- What is the potential for the transmission of blood borne viruses through scalp injuries (fetal scalp blood sampling or clips for heart rate monitoring)? (Informed narrative and consensus-based recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No studies identified)

Search dates

2010 to August 2016

Outcomes analysed

Vertical transmission of hepatitis C, low birth weight

Consensus-based recommendation

At the first antenatal visit, recommend testing for hepatitis C.
6.8 Syphilis (reviewed 2017)

**Research questions**

*Background question*

Q1: What is the prevalence of syphilis in pregnant women in Australia?

*Testing for syphilis*

Q2: What are the harms and benefits of routine antenatal testing for syphilis compared to targeted/no testing?

Q3: What is the diagnostic accuracy of tests available for detection of syphilis infection in pregnancy?

Q4: What are the harms and benefits of point of care testing for syphilis among pregnant women in remote communities?

*Interventions*

Q5: What interventions are safe and effective in the management of syphilis infection in pregnant women?

*Additional considerations*

Q6: What are the additional considerations for Aboriginal and Torres Strait Islander women?

Q7: What are the additional considerations for migrant and refugee women?

**Search strategy**

Publication date range: 2010 to September 2017

Databases searched: Pubmed, Cochrane, Australian Indigenous HealthInfoNet

**Outcomes analysed**

Congenital syphilis, stillbirth, neonatal mortality, preterm birth

**Evidence statements**

*Outcomes associated with syphilis during pregnancy*

Untreated syphilis during pregnancy is associated with stillbirth and fetal loss, neonatal death, preterm birth, low birthweight and congenital syphilis.

*Routine versus no testing*

An historical cohort study from the United States that compared routine testing for syphilis to no testing concluded that the results provide strong support for universal testing, particularly in countries with high prevalence.

No studies into the cost-effectiveness of routine testing in the Australian context were identified.

*Testing in the third trimester*

Studies conducted in the United States found that universal testing in the third trimester would require a seroconversion incidence of 0.017% (compared to the assumed base case incidence of 0.012%) or a prevalence of 3.5% to be cost-effective. A third study (also from the United States) in an area of high prevalence found that testing and treatment early in the third trimester prevented 78% of cases of congenital syphilis.

*Point-of-care testing*

There is currently only one syphilis point of care test registered by the Therapeutic Goods Administration in Australia, the Determine Syphilis TP™ manufactured by Alere. The CDNA notes the following limitations with current syphilis point-of-care tests:

- currently tests cannot distinguish current from previous syphilis infection, due to either the absence or non-quantified nature of a non-treponemal component
- even in ideal use, sensitivity is slightly lower than laboratory based assays
- the tests are moderately complicated and require staff to be specifically trained in their use
- the results may not be captured by current notification and testing registries.

*Intervention*

Treatment for syphilis with benzathine penicillin in the first or second trimester reduces rates of congenital syphilis (moderate certainty) and may reduce rates of other adverse outcomes (low certainty).

Risks from treatment among pregnant women are likely to be low (very low certainty).

Treatment for syphilis in the first or second trimester is more effective in reducing risk of congenital syphilis than treatment in the third trimester (low certainty).

**Evidence-based recommendation**

 Routinely recommend syphilis testing at the first antenatal visit.

**Harms and health benefits associated with the recommendation**

*Harms:*

No significant harms associated with routine syphilis testing were identified as confirmatory testing following an initial positive result is standard practice (ie reduced risk of false positives).

*Health benefits:*

Untreated syphilis during pregnancy is associated with stillbirth, preterm birth, neonatal death, low birthweight and congenital syphilis. Early treatment for women with confirmed syphilis improves outcomes for the baby.

**Implications for implementation**

As this recommendation does not differ from the previous recommendation, there are no implications for implementation.
### Consensus-based recommendation

Recommend repeat testing early in the third trimester (28–32 weeks) and at the time of birth for women at high risk of infection or reinfection.

<table>
<thead>
<tr>
<th>Harms and health benefits associated with the recommendation</th>
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<tbody>
<tr>
<td>Harms: No significant harms associated with repeat syphilis testing were identified as confirmatory testing following an initial positive result is standard practice (ie reduced risk of false positives).</td>
</tr>
<tr>
<td>Health benefits: Untreated syphilis during pregnancy is associated with stillbirth, preterm birth, neonatal death, low birthweight and congenital syphilis. Early treatment for women with confirmed syphilis improves outcomes for the baby.</td>
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<thead>
<tr>
<th>Implications for implementation</th>
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<tbody>
<tr>
<td>This recommendation may lead to an increase in testing during pregnancy, which is consistent with the increasing prevalence.</td>
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</tbody>
</table>

### Consensus-based recommendation

Seek advice from an expert in sexual health or infectious diseases regarding the care of women who test positive and their partners.

<table>
<thead>
<tr>
<th>Harms and health benefits associated with the recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harms: No harms were identified as this recommendation is consistent with advice from CDNA.</td>
</tr>
<tr>
<td>Health benefits: Treatment for women with confirmed syphilis and their partners improves outcomes for the baby.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Implications for implementation</th>
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<tbody>
<tr>
<td>No implications for implementation identified.</td>
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</table>

### Consensus-based recommendation

Ensure contact tracing (including offering testing and treatment to identified contacts) is carried out. Involve an expert in contact tracing if required or seek advice from a sexual health clinic or other relevant expert.

<table>
<thead>
<tr>
<th>Harms and health benefits associated with the recommendation</th>
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</thead>
<tbody>
<tr>
<td>Harms: The culture and gender of the interviewer and whether or not they are known to and trusted by the woman are relevant considerations.</td>
</tr>
<tr>
<td>Health benefits: Contact tracing and treatment for the woman’s partner(s) are critical to minimise the potential for re-infection as this represents a particular threat to the unborn baby.</td>
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<tr>
<th>Implications for implementation</th>
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<tbody>
<tr>
<td>As syphilis is a notifiable disease and this notification results in contact tracing, it is unlikely that there are implications for implementation associated with the recommendation.</td>
</tr>
</tbody>
</table>

### Evidence-based recommendation

For women with newly confirmed infectious syphilis, recommend an intramuscular dose of 1.8 g (given as two 900 mg injections) benzathine penicillin as soon as possible, ensuring that women receive treatment at least 30 days before the estimated date of birth to ensure adequate treatment before the birth.

<table>
<thead>
<tr>
<th>Harms and health benefits associated with the recommendation</th>
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<tbody>
<tr>
<td>Harms: Rates of adverse outcomes are higher among women receiving treatment in the third trimester compared to those treated in the first or second trimester, although there was considerable heterogeneity for outcomes other than congenital syphilis</td>
</tr>
<tr>
<td>Health benefits: Treatment of syphilis in pregnancy with at least 1.8 g (2.4 MU) benzathine penicillin intramuscularly as a single dose reduces the incidence of congenital syphilis by 97%, stillbirth by 82%, preterm birth by 64% and neonatal deaths by 80%</td>
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<tr>
<th>Implications for implementation</th>
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<tbody>
<tr>
<td>This recommendation may lead to increased treatment of women with confirmed syphilis, which is consistent with managing current outbreaks and rising prevalence.</td>
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</table>

### Consensus-based recommendation

In areas affected by an ongoing syphilis outbreak, recommend testing at the first antenatal visit, at 28 and 36 weeks, at the time of birth and 6 weeks after the birth.

<table>
<thead>
<tr>
<th>Harms and health benefits associated with the recommendation</th>
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<tbody>
<tr>
<td>Harms: No harms were identified as this recommendation is consistent with advice from CDNA.</td>
</tr>
<tr>
<td>Health benefits: Treatment for women with confirmed syphilis improves outcomes for the baby.</td>
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<tr>
<th>Implications for implementation</th>
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<tbody>
<tr>
<td>This recommendation may lead to an increase in testing in areas affected by an ongoing syphilis outbreak, which is likely to lead to improved outbreak management and reduced incidence of congenital syphilis.</td>
</tr>
</tbody>
</table>

### Consensus-based recommendation

In areas affected by an outbreak, treat women as soon as possible, without waiting for confirmatory testing, particularly if there is a risk of loss to follow-up.
Harms and health benefits associated with the recommendation

Harms: No harms were identified as this recommendation is consistent with advice from CDNA.
Health benefits: Treatment for women with syphilis improves outcomes for the baby.

Implications for implementation

This recommendation may lead to an increase in treatment of women in areas affected by an ongoing syphilis outbreak, which has positive implications for outbreak management.

6.9 Rubella (reviewed 2010)

NICE recommendation

Rubella susceptibility screening should be offered early in antenatal care to identify women at risk of contracting rubella infection and to enable vaccination in the postnatal period for the protection of future pregnancies. [B]

Research questions

- What is the prevalence of rubella susceptibility in pregnant women? (Informed narrative)
- Does screening pregnant women for rubella immunity lead to improved maternal and perinatal outcomes? (Informed Recommendations)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)

Search strategy

Databases searched: Medline; Embase; Australasian Medical Index; ATSIhealth; Google Scholar; Cochrane Database

Date of search: November 2010

Limits: English language

Publication dates for search: January 2003 - November 2010

Review findings

1 level IV study informed discussion of prevalence of non-immunity.

Recent evidence on screening (3 level II studies) focused on the risk of congenital rubella syndrome (CRS) for women inadvertently vaccinated during pregnancy or just prior to conception and found this to be very low.

1 level IV study informed discussion of non-immunity among Aboriginal and Torres Strait Islander women.

There was insufficient new evidence to change the NICE recommendation.

EAC recommendation

Routinely offer and recommend testing for rubella immunity at the first antenatal visit to identify women at risk of contracting rubella and enable postnatal vaccination to protect future pregnancies.

Evidence base     Consistency     Clinical impact     Generalisability     Applicability     Recommendation
B                 A                 B                 A                 A                 B

Evidence supporting recommendation (see Section 37.5)

Grageot-Keros & Enders 1997; Grillner et al 1983; Miller et al 1982

EAC recommendation

Inform women who have been vaccinated against rubella before they were aware of the pregnancy that the baby is highly unlikely to have been affected by the vaccine.

Evidence base     Consistency     Clinical impact     Generalisability     Applicability     Recommendation
A                 A                 B                 A                 A                 A

Evidence supporting recommendation (see Section 37.5)

Badilla et al 2007; Bar-Oz et al 2004; Hamkar et al 2006
6.10 Asymptomatic bacteriuria (reviewed 2010)

**NICE recommendation**

Women should be offered routine screening for asymptomatic bacteriuria by midstream urine culture early in pregnancy. Identification and treatment of asymptomatic bacteriuria reduces the risk of pyelonephritis. [no grading; area for further research]

**Research questions**

- What is the diagnostic accuracy of screening tests for asymptomatic bacteriuria? (Informed Recommendation)
- What benefits would result from screening for asymptomatic bacteriuria? (Informed Recommendation)
- What are the harms of not screening for asymptomatic bacteriuria? (No studies identified)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)

**Search strategy**

Databases searched: Medline, EMBASE, MIDIRS, CINAHL, BNI, SIGLE, JBI, CENTRAL, COCHRANE, PsycINFO, LILACS, DARE, CONTROLLED TRIALS, CONFERENCE PROCEEDINGS, NDLTD, APAIS - ATSIhealth, Health Collection, Health Source, Nursing Academic Edition, AHRQ, ISI Web of Knowledge, TRIP, MD Consult, HTA, NHS EED, Scopus, Google Scholar, Academic OneFile, MEDNAR, ANZCTR

Date of search: December 2010

Limits: Female/women, human

Publication dates for search: January 2003 - December 2010

**Review findings**

1 level I study, 3 level II studies, 3 level III-2 studies and 5 level IV studies supported the accuracy of urine culture.

The NICE recommendation is supported by a Cochrane review and an analysis of cost-effectiveness and cost-benefit of screening. No additional specific studies were identified which indicated benefits from screening. 1 level III-2 study found that urine cultures are of little clinical importance for predicting preterm labour.

No studies identified.

1 level IV study identified challenges with screening for Aboriginal women in remote communities. The Working Group for Aboriginal and Torres Strait Islander Women’s Antenatal care also provided advice on testing in rural and remote areas.

The evidence supports the NICE recommendation.

**EAC recommendation**

Routinely offer and recommend testing for asymptomatic bacteriuria early in pregnancy as treatment is effective and reduces the risk of pyelonephritis.

**Evidence supporting recommendations** (see Section 38.5)

Rouse et al 1995; Smaill & Vasquez 2007

**EAC recommendation**

Use urine culture testing wherever possible as it is the most accurate means of detecting asymptomatic bacteriuria.

**Evidence supporting recommendations** (see Section 38.5)

6.11 Group B streptococcus (reviewed 2013)

**NICE recommendation**

Pregnant women should not be offered routine antenatal screening for Group B streptococcus (GBS) because evidence of its clinical effectiveness and cost effectiveness remains uncertain. [C]

**Research questions**

- What is the prevalence and incidence of GBS in pregnancy, including population specific groups? [Informed narrative]
- What is the diagnostic test accuracy of screening for GBS? [Informed Recommendation]
- What is the cost effectiveness of screening for GBS? [Informed narrative]
- When should pregnant women be screened for GBS? [Informed Recommendation]
- What are the benefits and risk of screening for GBS? [Informed Recommendation]
- What interventions or treatments for GBS are effective and safe in pregnancy, and what advice should women receive? [Informed narrative]

**Search strategy**

Date of search: 27 January 2012
Publication date range: 2003-2011
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 75
Date of top-up search: 6 February 2013
Number of additional references included: 9

**Review findings**

The incidence of early onset Group B streptococcus infection in the newborn is reduced by preventive approaches that include intrapartum antibiotic treatment.

The diagnostic accuracy of culture-based testing is highest late in pregnancy.

Vaginal-rectal swabs provide collection yields whether collected by the woman or health professional.

**EAC recommendation**

Offer either routine antenatal testing for Group B streptococcus colonisation or a risk factor-based approach to prevention, depending on organisational policy.

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Evidence supporting recommendation (see Section 39.6)


**Implications for implementation**

No implications associated with implementation of the recommendation were identified.

**EAC recommendation**

If offering antenatal testing for Group B streptococcus, arrange for testing to take place at 35-37 weeks gestation.

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Evidence supporting recommendation (see Section 39.6)

Hiller et al 2005; Towers et al 2010; Valkenburg-van den Berg et al 2010

Implications for implementation

The EAC noted that the recommendation has resource implications (e.g., pathology costs), may lead to changes in the way that care is organised (e.g., women may need to change their planned place of birth and model of care) and that the associated resource and emotional implications that come with changes late in pregnancy may act as a barrier to implementation. Ways that women can still receive intravenous antibiotics outside conventional labour ward settings (i.e., in birth centres or at home) need to be explored and tested to ensure that women who choose to give birth in these settings can still have access to prophylactic treatment should this be required.

EAC recommendation

Encourage women to self-collect vaginal-rectal specimens for culture testing for Group B streptococcus and offer information about how to do this.

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Evidence supporting recommendation (see Section 39.6)

Price et al 2006; Kovavisarach et al 2007; Arya et al 2008; Daniels et al 2009; Hicks & Diaz-Perez 2009

Implications for implementation

The EAC noted that the recommendation may lead to changes in usual care and the way in which care is organised in some settings.
7 Targeted maternal health tests

7.1 Chlamydia (reviewed 2017)

Research questions

Testing for chlamydia

Q1: Compared to a reference test, what is the diagnostic accuracy of the following methods of identifying genital chlamydia among pregnant women: age, urine testing, endocervical swabs, history?

Q2: What are the harms and benefits of routine testing for chlamydia in pregnancy compared to targeted/no testing?

Q3: What are the harms and benefits of point-of-care testing compared to a reference test for chlamydia among pregnant women in remote communities?

Additional considerations

Q4: What are the additional needs of Aboriginal and Torres Strait Islander women?

Q5: What are the additional considerations for migrant and refugee women

Search strategy

Publication date range: 2010 to June 2017

Databases searched: Pubmed, Cochrane, Australian Indigenous HealthInfoNet

Outcomes analysed

Perinatal mortality, preterm birth, low birth weight, premature rupture of the membranes, miscarriage

Evidence statements

Sensitivity and specificity of urine samples for chlamydia relative to endocervical samples were 96.5% (95% CI 90.1 to 99.3%) and 100% (99.8 to 100%), respectively. The positive and negative predictive values were 100% (95% CI 95.6 to 100%) and 99.8% (95% CI 99.5 to 100%), respectively.

The prevalence of chlamydia is highest among women aged <30 years. Early treatment reduces the risk of preterm birth among young women.

An Australian cost-effectiveness study found that, from an Australian government perspective, chlamydia testing of all women aged 16–25 years old during an antenatal visit was likely to be cost-effective compared with no testing or selective testing, especially with increasing chlamydia prevalence.

Consensus-based recommendation

When testing for chlamydia in pregnant women, consider the use of urine samples or self-collected vaginal samples.

Harms and health benefits associated with the recommendation

Harms: No significant harms were identified as the recommendation is consistent with the Australian STI Management Guidelines.

Health benefits: Untreated chlamydia infection during pregnancy is associated with preterm birth, low birth weight and perinatal mortality. Early treatment of chlamydia infection in pregnancy improves outcomes for the baby.

Implications for implementation

No implications for implementation identified.

Consensus-based recommendation

Routinely offer chlamydia testing at the first antenatal visit to pregnant women younger than 30 years.

Harms and health benefits associated with the recommendation

Harms: No significant harms associated with chlamydia testing were identified as sensitivity, specificity and positive and negative predictive values were high.

Health benefits: Untreated chlamydia infection during pregnancy is associated with preterm birth, low birth weight and perinatal mortality. Early treatment of chlamydia infection in pregnancy improves outcomes for the baby.

Implications for implementation

This recommendation has the potential to increase testing in women aged 25 to 30 as the previous recommendation was to offer testing to women younger than 25 years. This is consistent with rising prevalence in this age group.
7.2 Gonorrhoea (reviewed 2012)

**NICE recommendation**

There is no NICE recommendation for gonorrhoea in pregnancy.

**Research questions**

- What is the prevalence and incidence of gonorrhoea in pregnancy, including in population specific groups? [Informed narrative]
- What is the diagnostic test accuracy of screening for gonorrhoea? [Informed narrative]
- What is the cost effectiveness of screening for gonorrhoea? [No evidence identified]
- What are the harms of not screening for gonorrhoea? [No evidence identified]
- When should pregnant women be screened for gonorrhoea? [Informed narrative]
- What are the additional needs of population specific groups? [No evidence identified]
- What are the maternal and/or fetal benefits of screening for gonorrhoea? [No evidence identified]
- What interventions or treatments for gonorrhoea are effective and safe in pregnancy; and what advice should women receive? [Informed narrative]

**Search strategy**

Date of search: 24 November 2011

Publication date range: 2003–2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Number of references included: 15

Date of top-up search: 23 October 2012 [No additional studies identified]

**Review findings**

There is insufficient evidence to support a recommendation on screening for gonorrhoea.

**Consensus-based recommendation**

Do not routinely offer gonorrhoea testing to all women as part of antenatal care.

Offer gonorrhoea testing to pregnant women who have known risk factors or who live in or come from areas where prevalence is high.

7.3 Trichomoniasis (reviewed 2013)

**NICE recommendation**

Not covered in NICE guidelines.

**Research questions**

- What is the prevalence and incidence of trichomoniasis, including population specific groups? [Informed narrative]
- What are the risk factors for developing trichomoniasis? [Informed narrative]
- What is the predictive and diagnostic test accuracy of screening for trichomoniasis? [Informed narrative]
- What are the benefits and risks of screening for trichomoniasis? [No evidence identified]
- When in pregnancy should screening for trichomoniasis be carried out? [Informed narrative]
- What treatment/s for trichomoniasis is effective and safe in pregnancy? (Informed Recommendation]
- What advice should be provided to women to prevent developing trichomoniasis in pregnancy? [Informed narrative]
Search strategy
Date of search: 23 May 2012
Publication date range: 2003-2011
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 46
Date of top-up search: 10 April 2013. No additional studies identified.

Review findings
The benefits of screening for trichomoniasis are limited by uncertainties about the effect of treatments during pregnancy. Treatment of asymptomatic pregnant women is not recommended.

EAC recommendation
Offer testing to women who have symptoms of trichomoniasis, but not to asymptomatic women.

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Evidence supporting recommendation (see Section 42.6)

Implications for implementation
No implications associated with implementation of the recommendation were identified.

7.4 Toxoplasmosis (reviewed 2013)

NICE recommendations
Routine antenatal serological screening for toxoplasmosis should not be offered because the risks of screening may outweigh the potential benefits. [B]

Pregnant women should be informed of primary prevention measures to avoid toxoplasmosis infection, such as:

- washing hands before handling food
- thoroughly washing all fruit and vegetables, including ready-prepared salads, before eating
- thoroughly cooking raw meats and ready-prepared chilled meals
- wearing gloves and thoroughly washing hands after handling soil and gardening
- avoiding cat faeces in cat litter or in soil. [C]
Research questions

- What is the prevalence and incidence of toxoplasmosis in pregnancy, including population specific groups? [Informed narrative]
- What is the predictive and diagnostic test accuracy of screening for toxoplasmosis? [Informed Recommendation]
- What is the cost effectiveness of screening for toxoplasmosis? [No evidence identified]
- What are the harms of not screening for toxoplasmosis? [Informed Recommendation]
- When should pregnant women be screened for toxoplasmosis? [Informed narrative]
- What are the maternal and/or fetal benefits of screening for toxoplasmosis? [Informed Recommendation]
- What advice should be provided to women to prevent developing toxoplasmosis in pregnancy? [Informed Recommendation]
- What interventions or treatments for toxoplasmosis are effective and safe in pregnancy? [Informed narrative]

Search strategy

Date of search: 29 November 2011
Publication date range: 2003–2011
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 44
Date of top-up search: 14 January 2013
Number of additional references included: 2

Review findings

The evidence on the benefits to women and babies of screening for toxoplasmosis is limited and inconclusive. There is suggestive evidence that women may have low levels of knowledge about the risks associated with T. gondii and that health education approaches may help reduce risk of congenital toxoplasmosis.

EAC recommendation

Do not routinely offer testing for toxoplasmosis to pregnant women.

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Evidence supporting recommendation (see Section 43.6)


Implications for implementation

No implications associated with implementation of the recommendation were identified.

EAC recommendation

Advise pregnant women about measures to avoid toxoplasmosis infection such as:
- washing hands before handling food
- thoroughly washing all fruit and vegetables, including ready-prepared salads, before eating
- thoroughly cooking raw meat and ready-prepared chilled meals
- wearing gloves and thoroughly washing hands after handling soil and gardening
- avoiding cat faeces in cat litter or in soil.
Evidence base | Consistency | Clinical impact | Generalisability | Applicability | Recommendation
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D | C | C | B | B | C

**Evidence supporting recommendation** (see Section 43.6)

Gollub et al 2008; Ferguson et al 2011

**Implications for implementation**

No implications associated with implementation of the recommendation were identified.

### 7.5 Cytomegalovirus (reviewed 2018)

**Research questions**

**Prevalence and risk factors**

Q1: What is the prevalence and incidence of cytomegalovirus in pregnancy, including population specific groups?
Q2: What are the risk factors for developing cytomegalovirus in pregnancy?

**Testing for cytomegalovirus**

Q3: What is the diagnostic accuracy of testing for cytomegalovirus?
Q4: What is the cost effectiveness of testing for cytomegalovirus?
Q5: What are the harms and benefits of testing for cytomegalovirus?
Q6: When should pregnant women be screened for cytomegalovirus?

**Interventions**

Q7: What interventions or treatment for cytomegalovirus are effective and safe in pregnancy?

**Additional considerations**

Q8: What are the additional considerations for Aboriginal and Torres Strait Islander women?
Q9: What are the additional considerations for migrant and refugee women

**Search strategy**

Publication date range: 2010 to April 2018

Databases searched: Pubmed, Ovid Medline, Embase, Cochrane, Australian Indigenous HealthInfoNet

**Outcomes analysed**

Perinatal mortality, preterm birth, low birth weight, premature rupture of the membranes, miscarriage

**Evidence summary**

**Background**

Congenital cytomegalovirus is the most frequent infectious cause of newborn disability in developed countries. Mother-child transmission of cytomegalovirus is higher for maternal primary infection than re-activated (non-primary) infection (30-35% versus 1.4%). The risk for long-term outcomes appears to be highest in infants born to mothers with primary infection in the first half of pregnancy.

About 10% of babies infected with cytomegalovirus are born with symptoms and are at risk of developing sensorineural hearing loss (35%) or cognitive deficits (up to 60%) or of death (4%). Babies who are infected and who are born without symptoms may have normal hearing at birth but are also at risk of developing long-term neurological sequelae (10-15%), in particular hearing impairment (7-10%). In developed countries, congenital cytomegalovirus accounts for 21% and 24% of cases of hearing loss at birth and 4 years of age, respectively.

**Prevalence and risk factors**

Cytomegalovirus is a highly prevalent infectious agent in the general population; seropositivity rates in adult women range between 40 and 90%, with the highest rates occurring in individuals from lower socio-economic background.

Approximately 40% of Australian women of childbearing age are at risk of a primary cytomegalovirus infection during pregnancy. The rate of symptomatic disease resulting from congenital cytomegalovirus infection has been estimated at 3.7 per 100,000 live births (0.004%) but this may be an underestimate as it is based on voluntary reporting. Based on average global figures in all socioeconomic groups, it has been estimated that each year 437 children in Australia will be born with or develop cytomegalovirus-related disease resulting from primary or non-primary maternal infection.

Primary cytomegalovirus infection occurs following close personal contact and is transmitted via body fluids or objects that are likely to carry infection (eg utensils) between individuals, or vertically across the placenta resulting in congenital infection in the fetus. Children, when infected vertically or in the first few years of life, can shed virus in urine and saliva for many years either continuously or intermittently. Cytomegalovirus therefore spreads readily in settings where preschool children are concentrated. This places seronegative pregnant women who work in child care centres or who have a young child in the home or in day care at increased risk of seroconversion.

**Testing for cytomegalovirus**

Up to 50% of maternal cytomegalovirus infections have nonspecific clinical manifestations, and most remain undetected unless specific serological testing is undertaken. The combination of serology tests for cytomegalovirus-specific IgM, IgG
and IgG avidity provide improved distinction between primary and secondary maternal infections. However, difficulties in accurate diagnosis, absence of effective interventions in preventing transmission of cytomegalovirus from mothers with primary cytomegalovirus infection to their infant, possibility of reinfection or reactivation, and the challenges in providing definite prognosis to an individual mother means that universal testing of pregnant women is not currently recommended in most countries including the UK and North America. The International Congenital Cytomegalovirus Recommendations Group noted that universal testing of pregnant women for primary cytomegalovirus infection is currently not recommended. The consensus document recommends that cytomegalovirus serology tests (cytomegalovirus-specific IgG, IgM, and IgG avidity) should be offered when a pregnant woman develops an illness with influenza-like symptoms (typically fever, fatigue, and headache) not attributable to another specific infection, or when imaging findings (ultrasound or the less frequently used MRI) are suggestive of fetal cytomegalovirus infection. Conclusions on the cost-effectiveness of testing for cytomegalovirus are limited by insufficient evidence on the effectiveness of treatments in preventing congenital cytomegalovirus.

**Prevention and treatment**

Prevention of maternal infection using hygiene and behavioural interventions reduces maternal seroconversion rates during pregnancy. Knowledge about cytomegalovirus among women who are pregnant or planning a pregnancy is limited to one in five women and only one in ten health professionals routinely discuss cytomegalovirus prevention with pregnant women. Cytomegalovirus hyperimmune globulin treatment does not appear to reduce the risk of congenital infection and the evidence on adverse effects is inconsistent. The evidence on cytomegalovirus antiviral therapy as prophylaxis or treatment is too limited for conclusions to be drawn.

**Consensus-based recommendation**

Advising all pregnant women about hygiene measures to help reduce the risk of cytomegalovirus infection, including avoiding contact with a child’s saliva or urine and hand washing after such exposure.

**Harms and health benefits associated with the recommendation**

**Harms:** There is no significant increase in anxiety among women given information about cytomegalovirus in pregnancy. However, as there are currently no treatments that significantly reduce the risk of congenital infection, women with a positive result may experience anxiety if they receive a positive test result.  
**Health benefits:** Cytomegalovirus is associated with late miscarriage, stillbirth, hydrops and growth restriction. Congenital cytomegalovirus is the most frequent cause of newborn disability in Australia. Hygiene measures help to reduce the risk of cytomegalovirus infection. Provision of information regarding congenital cytomegalovirus prevention strategies to pregnant women improves their knowledge and is acceptable to them.

**Implications for implementation**

No direct implications for implementation identified. However, due to the current lack of knowledge among women and low levels of health professionals providing information on cytomegalovirus to pregnant women awareness raising beyond the information in the Guidelines may be required.

**Consensus-based recommendation**

Offering testing for cytomegalovirus to pregnant women if they have symptoms suggestive of cytomegalovirus that are not attributable to another specific infection or when imaging findings suggest fetal infection.

**Harms and health benefits associated with the recommendation**

**Harms:** There is potential for women with identified infection to experience anxiety due to the absence of an effective treatment.  
**Health benefits:** Women with identified infection can be referred for expert advice, including neonatal guidance after the birth.

**Implications for implementation**

This recommendation has the potential to increase testing for cytomegalovirus during pregnancy.

**Consensus-based recommendation**

Offering testing for cytomegalovirus to women who come into frequent contact with large numbers of very young children (e.g. childcare workers), using serology (cytomegalovirus-specific IgG only).

**Harms and health benefits associated with the recommendation**

**Harms:** There is potential for women with identified infection to experience anxiety due to the absence of an effective treatment.  
**Health benefits:** Women with identified infection can be referred for expert advice, including neonatal guidance after the birth.

**Implications for implementation**

This recommendation has the potential to increase testing for cytomegalovirus during pregnancy.
7.6 Asymptomatic bacterial vaginosis (reviewed 2010)

### NICE recommendation

Pregnant women should not be offered routine screening for bacterial vaginosis because the evidence suggests that the identification and treatment of asymptomatic bacterial vaginosis does not lower the risk for preterm birth and other adverse reproductive outcomes. [A]

### Research questions

- What is the diagnostic accuracy of screening tests for asymptomatic bacterial vaginosis? (Informed narrative)
- What benefits would result from screening for asymptomatic bacterial vaginosis? (Informed Recommendation)
- What are the harms of not screening for asymptomatic bacterial vaginosis? (Informed Recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No studies identified)

### Search strategy

Databases searched: Medline, EMBASE, MIDIRS, CINAHL, BNI, SIGLE, JBI, CENTRAL, COCHRANE, PsycINFO, LILACS, DARE, CONTROLLED TRIALS, CONFERENCE PROCEEDINGS, NDLTD, APAIS - ATSIhealth, Health Collection, Health Source, Nursing Academic Edition, AHRQ, ISI Web of Knowledge, TRIP, MD Consult, HTA, NHS EED, Scopus, Google Scholar, Academic OneFile, MEDNAR, ANZCTR

Date of search: December 2010

Limits: English language

Publication dates for search: January 2003 - December 2010

### Review findings

9 level III-2 studies discussed tests for asymptomatic bacterial vaginosis and suggested that Gram stains were effective. 1 level I, 1 level III-1, 1 level III-2 and 1 level III-3 study suggested that the general population seems to lack any clear clinical benefit from screening and treatment for asymptomatic bacterial vaginosis during pregnancy.

1 level I study suggested that, although a subgroup of high-risk women may benefit from screening and treatment for bacterial vaginosis in pregnancy, a sizable group would receive either no benefit or may experience harm.

No relevant studies identified.

The recent evidence supports the NICE recommendation.

### EAC recommendation

Do not routinely offer pregnant women testing for bacterial vaginosis.

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### Evidence supporting recommendation (see Section 43.5)

McDonald et al 2007; Nygren et al 2008
## Thyroid dysfunction (reviewed 2016)

### Research questions

- What is the prevalence and incidence of thyroid dysfunction in pregnancy, including population specific groups? (Informed narrative)
- What is the diagnostic test accuracy of screening for thyroid dysfunction? (Informed narrative)
- What are the benefits and harms of routine screening for thyroid dysfunction? (Informed evidence-based and consensus-based recommendations)
- When should pregnant women be screened for thyroid dysfunction? (Informed narrative)
- What interventions or treatments for thyroid dysfunction are effective and safe in pregnancy, and what advice should women receive? (No evidence identified)
- What is the cost effectiveness of universal screening in pregnancy for hypothyroidism? (No evidence identified)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No evidence identified)

### Outcomes analysed

Fetal or neonatal death, neurosensory disability of the infant as child, diagnosis of hypothyroidism, diagnosis of hyperthyroidism, pre-eclampsia, preterm birth, miscarriage, caesarean section

### Evidence statements

**Universal testing vs case finding**

- Universal testing for thyroid dysfunction identifies more women with hypothyroidism than case finding (high quality evidence) and more women with hyperthyroidism are identified (moderate quality evidence).
- The rate of preterm birth does not differ substantially between women who undergo case finding for thyroid dysfunction and those who are universally tested (high quality evidence).
- Rates of miscarriage, pre-eclampsia and neonatal death are not clearly different between women who undergo case finding for thyroid dysfunction and those who are universally tested (moderate quality evidence).

**Universal testing vs no testing**

- Universal testing for thyroid dysfunction identifies more women with hypothyroidism than no testing (moderate quality evidence)
- Prevalence of neurosensory disability of the infant is not clearly different between the two groups (moderate quality evidence).
- Rates of miscarriage are lower and those of caesarean section are higher among women universally tested for thyroid dysfunction compared to those not tested (low quality evidence).
- Rates of preterm birth are not clearly different between women universally tested for thyroid dysfunction and those not tested (very low quality evidence).

### Evidence-based recommendation

Do not routinely test pregnant women for thyroid dysfunction.

### References

(see Section 46.6)

Level I: Spencer et al 2015; Level II: Ma et al 2016

### Implications for implementation

No implications associated with implementation of the recommendation were identified as it is consistent with the recommendation given in Module II (Australian Health Ministers’ Advisory Council 2014)

### Consensus-based recommendation

Recommend thyroid testing to pregnant women who are at increased risk of thyroid dysfunction.

### Implications for implementation

No implications associated with implementation of the recommendation were identified as it is consistent with the recommendation given in Module II (Australian Health Ministers’ Advisory Council 2014)
### 7.8 Vitamin D status (reviewed 2016)

#### Research questions

- Who should be tested for vitamin D status? (Informed narrative and evidence-based recommendation)
- What are the benefits and risks of vitamin D supplementation in pregnancy? (Informed narrative and evidence-based recommendation)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (Informed narrative)
- What are the additional considerations for women from culturally and linguistically diverse groups? (Informed narrative)

#### Search dates

2010 to April 2016

#### Outcomes analysed

Pre-eclampsia, gestational diabetes, preterm birth, low birth weight (<2,500g), adverse effects of supplementation, maternal vitamin D status at term

#### Evidence statements

**Vitamin D supplementation alone compared to placebo or no treatment**

- The risk of preterm birth and low birthweight (<2,500g) is lower among women who take vitamin D supplements in pregnancy than among women who do not (moderate quality evidence).
- Serum vitamin D level at term is higher in women who take vitamin D supplements in pregnancy than in women who do not (low quality evidence).
- The risk of pre-eclampsia is lower among women who take vitamin D supplements in pregnancy than among women who do not but the statistical significance is borderline (low quality evidence).
- There is no clear difference in the risk of gestational diabetes between women who take vitamin D supplements in pregnancy and those who do not (very low quality evidence).
- There is insufficient evidence for conclusions to be drawn on adverse effects associated with vitamin D supplementation in pregnancy.

**Vitamin D supplementation plus calcium compared to placebo or no treatment**

- The risk of pre-eclampsia is lower and risk of preterm birth higher among women who take supplements of vitamin D plus calcium in pregnancy than among those who do not (moderate quality evidence).
- The risk of gestational diabetes is lower among women who take supplements of vitamin D plus calcium in pregnancy than among those who do not; however, given the scarcity of data and the wide confidence interval no firm conclusions can be drawn (low quality evidence).
- 2000 international units (IU) compared to 4000 IU vitamin D supplementation in pregnancy
- Women are more likely to achieve vitamin D levels of ≥80 nmol/L with doses of 4000 IU than with doses of 2000 IU (low quality evidence).
- Differences between groups in the risk of gestational diabetes (moderate quality evidence), preterm birth (moderate quality evidence) and hypertensive disorders of pregnancy (low quality evidence) did not reach statistical significance.

#### Evidence-based recommendation

Do not routinely recommend testing for vitamin D status to pregnant women in the absence of a specific indication.

#### References (see Section 47.5)

**Implications for implementation**

The EAC noted that testing for vitamin D status among pregnant women is routinely conducted in some settings and that resource use would be reduced in these settings (for the health system, health care providers and women who would previously have been recommended supplementation). The existing MBS item 66833 for vitamin D testing can be used for the investigation of a person who: has deeply pigmented skin, or chronic and severe lack of sun exposure for cultural, medical, occupational or residential reasons (irrespective of pregnancy status) but not for people who do not meet these criteria.

**Consensus-based recommendations**

If testing is performed, only recommend vitamin D supplementation for women with levels lower than 50 nmol/L.

**Implications for implementation**

The EAC noted that limiting supplementation to women with identified levels lower than 50 nmol/L will reduce resource implications for women.

### 7.9 Human papilloma virus (reviewed 2012)

**NICE recommendation**

Not covered in NICE guidelines.

**Research questions**

- What are the indications for performing a cervical smear during pregnancy? [Informed narrative]
- What are the benefits and risks of performing a cervical smear during pregnancy? [Informed narrative]
- When in pregnancy should a cervical smear be performed? [Informed narrative]
- What is the prevalence and incidence of abnormal cervical smear results in pregnancy, including in population specific groups? [Informed narrative]
- What is the diagnostic test accuracy of cervical smear in pregnancy? [Informed narrative]
- What advice should be provided to women who have abnormal cervical smear results in pregnancy? [Informed narrative]

**Search strategy**

Date of search: 10 July 2012

Publication date range: 2003–2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Number of references included: 14

Date of top-up search: 24 October 2012

Number of additional references included: 1

**Review findings**

There is insufficient evidence to support a recommendation on screening for cervical abnormalities.

**Consensus-based recommendation**

Offer women cervical screening as specified by the National Cervical Screening Program.
8 Fetal chromosomal anomalies

8.1 Chromosomal anomalies (reviewed 2011)

NICE recommendation

All pregnant women should be offered screening for Down’s syndrome. Women should understand that it is their choice to embark on screening for Down’s syndrome.

Screening for Down’s syndrome should be performed by the end of the first trimester (13 weeks 6 days), but provision should be made to allow later screening (which could be as late as 20 weeks 0 days) for women booking later in pregnancy.

The ‘combined test’ (nuchal translucency, beta-human chorionic gonadotrophin, pregnancy-associated plasma protein-A) should be offered to screen for Down’s syndrome between 11 weeks 0 days and 13 weeks 6 days. For women who book later in pregnancy the most clinically and cost-effective serum screening test (triple or quadruple test) should be offered between 15 weeks 0 days and 20 weeks 0 days.

When it is not possible to measure nuchal translucency, owing to fetal position or raised body mass index, women should be offered serum screening (triple or quadruple test) between 15 weeks 0 days and 20 weeks 0 days.

Information about screening for Down’s syndrome should be given to pregnant women at the first contact with a healthcare professional. This will provide the opportunity for further discussion before embarking on screening. (Refer to Section 3.3 for more information about giving antenatal information). Specific information should include:

- the screening pathway for both screen-positive and screen-negative results
- the decisions that need to be made at each point along the pathway and their consequences
- the fact that screening does not provide a definitive diagnosis and a full explanation of the risk score obtained following testing
- information about chorionic villus sampling and amniocentesis
- balanced and accurate information about Down’s syndrome.

If a woman receives a screen-positive result for Down’s syndrome, she should have rapid access to appropriate counselling by trained staff.

Research questions

- Which tests should be used to screen for chromosomal abnormalities? (Informed Recommendations)
- What is the impact of maternal age on chromosomal screening and choice of test? (Inconsistent evidence)
- Which tests are available/should be used in rural/remote locations? (Informed narrative)
- Who should be offered prenatal testing? (Informed narrative)
- What is the psychological impact of prenatal screening? (Informed Consensus-based recommendation)
- What is the psychological impact of not offering prenatal screening? (No studies identified)
- What counselling is required before and after screening? What constitutes informed consent? (Informed Consensus-based recommendations)
- What additional information do pregnant women require regarding the results of their chromosomal screening tests? (Informed narrative)
- What are the additional considerations for Aboriginal and Torres Strait Islander women? (No studies identified)
Search strategy

Databases searched: Medline; Embase; Australasian Medical Index; ATSIhealth; Google Scholar; Cochrane Database

Date of search: January 2011

Limits: English language


Review findings

The findings from 4 level I studies, 4 level II studies and 12 level III-2 studies suggest that nuchal translucency thickness scans before 12 weeks are more accurate. Adding biochemical markers will either improve detection of chromosomal abnormalities or not change it. The addition of first trimester screening may lead to reduced rates of invasive testing and fewer losses of normal pregnancies. Detailed ultrasound examination at early gestational age may not be superior to nuchal scan in screening for fetal abnormalities. Second trimester amniocentesis is safer than early amniocentesis. Amniocentesis at 13 weeks carries an increased risk of talipes equinovarus compared with chorionic villus sampling.

The evidence from 2 Level II studies, 22 Level III-2 studies, 2 Level III-3 studies and 2 Level IV studies was inconsistent regarding maternal age in relation to screening for chromosomal abnormalities and choice of test.

2 Level III-2 studies suggested that interventions should be targeted at rural areas as there is unequal access to screening in these areas.

2 level III-2 and 3 Level III-3 studies suggested that combining first trimester screening with screening in the second trimester is most effective.

2 level I and 2 level II studies supported the need for counselling following screening. 1 level I study informed the narrative on the use of decision aids.

1 level I study supported the provision of information about screening.

Advice on information provision provided by the Working Group for Aboriginal and Torres Strait Islander Women’s Antenatal Care.

EAC recommendation

If a woman chooses to have a diagnostic test for chromosomal anomaly, base the choice of test on gestational age (chorionic villus sampling before 14 weeks pregnancy and amniocentesis after 15 weeks) and the woman’s/couple’s preferences.

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Evidence supporting recommendations (see Section 53.2)

Alfirevic et al 2003; Philip et al 2004

Consensus-based recommendations

In the first trimester, give all women/couples information about the purpose and implications of testing for chromosomal anomalies to enable them to make informed choices.

If a woman chooses to have the combined test (nuchal translucency thickness, free beta-human chorionic gonadotrophin, pregnancy associated plasma protein-A), make arrangements so that blood for biochemical analysis is collected between 9 weeks and 13 weeks 6 days and ultrasound assessment takes place between 11 weeks 0 days and 13 weeks 6 days gestation.

Offer rapid access to appropriate counselling and ongoing support by trained health professionals to women who receive a diagnosis of fetal chromosomal anomaly.
8.2 Cell-free DNA testing (reviewed 2016)

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<tr>
<td>• Are there additional benefits and costs associated with replacing the first trimester serum and nuchal translucency screening with non-invasive prenatal testing (cell-free deoxyribonucleic acid [cfDNA] testing)? (Informed narrative)</td>
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<td>• Are there specific issues for Aboriginal and Torres Strait Islander women and rural and remote populations? (No evidence identified)</td>
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<tbody>
<tr>
<td>2008 to May 2016</td>
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</table>

<table>
<thead>
<tr>
<th>Outcomes analysed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection of trisomy 21, detection of trisomy 18, detection of trisomy 13, detection of sex chromosome anomalies, detection of atypical anomalies, rates of invasive procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cfDNA testing compared to combined first trimester screening for detection of fetal chromosomal anomalies</strong></td>
</tr>
<tr>
<td>• Cell-free DNA testing has a higher detection rate for the more common trisomies (trisomies 21, 18 and 13), lower detection rates for sex chromosome and atypical aneuploidies and a lower risk of invasive procedures compared with combined first trimester screening (low quality evidence).</td>
</tr>
</tbody>
</table>

| **Second-line cfDNA testing compared to combined first trimester screening for detection of fetal chromosomal anomalies** |
| • Second-line cfDNA testing has a higher detection rate for the more common trisomies (trisomies 21, 18 and 13), lower detection rates for atypical aneuploidies, lower risk of invasive procedures compared with combined first trimester screening and the difference in detection of sex chromosome aneuploidies did not reach significance (low quality evidence). |

No new recommendations were developed
9 Common conditions in pregnancy

9.1 Nausea and vomiting (reviewed 2010)

**NICE recommendation**

Women should be informed that most cases of nausea and vomiting in pregnancy will resolve spontaneously within 16 to 20 weeks and that nausea and vomiting are not usually associated with a poor pregnancy outcome. If a woman requests or would like to consider treatment, the following interventions appear to be effective in reducing symptoms: non-pharmacological: ginger, P6 (wrist) acupressure; pharmacological: antihistamines.

Information about all forms of self-help and nonpharmacological treatments should be made available for pregnant women who have nausea and vomiting. [PP]

**Research question**

- Are there effective interventions to treat nausea and vomiting in pregnancy and what are the perinatal outcomes associated with these interventions? (Informed narrative)

**Search strategy**

*Databases searched: Medline; Embase; Google Scholar*

*Date of searches: November 2009; November 2010*

*Limits: English language*

*Publication dates for searches: January 2003 - August 2009*

*January 2008 - November 2010*

**Review findings**

While there is a growing body of evidence in support of the use of various interventions for symptoms of nausea and vomiting, as yet there remain insufficient data to recommend any particular treatment. The recent Cochrane review strengthens the evidence base but found insufficient evidence to recommend specific interventions or alter the NICE practice point.

9.2 Constipation (reviewed 2010)

**NICE recommendation**

Women who present with constipation in pregnancy should be offered information regarding diet modification, such as bran or wheat fibre supplementation. [A]

**Research question**

- What is the prevalence of constipation in pregnant women? (Informed narrative)
- What interventions help relieve constipation and are safe in pregnancy? (Informed Recommendations)
Search strategy
Databases searched: Medline; Embase; Psychinfo; Cochrane Database of Systematic Reviews, Australasian Medical Index.
Date of searches: March 2009; November 2010
Limits: English language

Review findings
4 level IV studies informed the narrative.
The 1 level I study (a Cochrane review) identified was consistent with the NICE recommendation. This review, 1 level III-3 study and 1 level IV study also supported a recommendation on laxatives.

EAC recommendation
Offer women who are experiencing constipation information about increasing dietary fibre intake and taking bran or wheat fibre supplementation.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
<th>Applicability</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>NA</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>C</td>
</tr>
</tbody>
</table>

Evidence supporting recommendation (see Section 55.5)
Jewell & Young 2010

EAC recommendation
Advise women who choose to take laxatives that preparations that stimulate the bowel are more effective than those that add bulk but may cause more adverse effects such as diarrhoea and abdominal pain.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
<th>Applicability</th>
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<tr>
<td>C</td>
<td>C</td>
<td>B</td>
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</tr>
</tbody>
</table>

Evidence supporting recommendation (see Section 55.5)
Jewell & Young 2010; Neri et al 2004; Vasquez 2008

9.3 Reflux (reviewed 2012)

NICE recommendations
Women who present with symptoms of heartburn in pregnancy should be offered information regarding lifestyle and diet modification. [Good practice point]
Antacids may be offered to women whose heartburn remains troublesome despite lifestyle and diet modification. [A]

Research questions
- What is the prevalence and incidence of heartburn in pregnancy, including population specific groups? [Informed narrative]
- What interventions or treatments for heartburn are effective and safe in pregnancy? [Informed Recommendation]
- What advice should women receive who are experiencing heartburn? [Narrative reviews informed consensus-based recommendation]
Search strategy

Date of search: 31 August 2012
Publication date range: 2003-2012

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Search terms: Premature labour (labor), aetiology, prevention, control, prevalence, incidence, Aborigine, Australia, systematic review, clinical trial, comparative study, meta-analysis practice guideline

Number of references included: 18

Date of top-up search: 5 November 2012 [No additional studies identified]

Review findings

There is limited evidence on the effectiveness of treatments to relieve reflux in pregnancy and low-level evidence on its safety.

EAC recommendation

Give women who have persistent reflux, information about treatments.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
<th>Applicability</th>
<th>Recommendation</th>
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<td>B</td>
<td>D</td>
<td>B</td>
<td>B</td>
<td>C</td>
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</tbody>
</table>

Supporting evidence (see Section 56.5)


Implications for implementation

No implications associated with implementation of the recommendation were identified.

Consensus-based recommendation

Offer women experiencing mild symptoms of heartburn advice on lifestyle modifications and avoiding foods that cause symptoms on repeated occasions.

9.4 Haemorrhoids (reviewed 2012)

NICE recommendation

In the absence of evidence for the effectiveness of treatments for haemorrhoids in pregnancy, women should be offered information concerning diet modification. If clinical symptoms remain troublesome, standard haemorrhoid creams should be considered. [Good practice point]

Research questions

- What is the prevalence and incidence of haemorrhoids in pregnancy? [No evidence identified]
- What advice should women receive on how to prevent haemorrhoids? [No evidence identified]
- What interventions or treatments for haemorrhoids are effective and safe in pregnancy? [Informed narrative]
- What advice should women receive who are diagnosed with haemorrhoids? [No evidence identified]
Search strategy

Date of search: 21 September 2011
Publication date range: 2003-2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.


Number of references included: 1
Date of top-up search: 5 November 2012
Number of additional studies included: 1

Review findings

There is insufficient evidence to support a recommendation on interventions, treatments or advice on haemorrhoids.

Consensus-based recommendation

Offer women who have haemorrhoids information about increasing dietary fibre and fluid intake. If clinical symptoms remain, advise women that they can consider using standard haemorrhoid creams.

9.5 Varicose veins (reviewed 2012)

NICE recommendation

Women should be informed that varicose veins are a common symptom of pregnancy that will not cause harm and that compression stockings can improve the symptoms but will not prevent varicose veins from emerging. [A]

Research questions

• What advice should women receive on how to prevent varicose veins? [No evidence identified]

• What interventions or treatments for varicose veins are effective and safe in pregnancy? [Informed narrative]

• What advice should women receive who are diagnosed with varicose veins? [Informed narrative]

Search strategy

Date of search: 22 November 2011
Publication date range: 2003-2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Number of references included: 5
Date of top-up search: 19 October 2012 [No additional studies identified]

Review findings

There is insufficient evidence to support a recommendation on interventions, treatments or advice on varicose veins.

Consensus-based recommendation

Advise women that varicose veins are common during pregnancy, vary in severity, will not generally cause harm and usually improve after the birth. Correctly fitted compression stockings may be helpful.
## 9.6 Pelvic girdle pain (reviewed 2012)

### NICE recommendation

More research on effective treatments for symphysis pubis dysfunction is needed. [Evidence summary]

### Research questions

- What is the prevalence and incidence of symphysis pubis dysfunction in pregnancy, including population specific groups? [Informed narrative]
- What interventions or treatments for symphysis pubis dysfunction are effective and safe in pregnancy? [Informed Recommendation]
- What advice should women receive who are diagnosed with symphysis pubis dysfunction? [Informed narrative]

### Search strategy

**Date of search:** 26 October 2011  
**Publication date range:** 2003-2011  
**Databases searched:** Medline, Embase, Cochrane, PsychINFO, Cinahl.  
**Number of references included:** 26

**Date of top-up search:** 26 October 2012  
**Number of additional references included:** 6

### Review findings

Exercises, physiotherapy, acupuncture or using a support garment may be effective in relieving pelvic girdle pain.

### EAC recommendation

Advise women experiencing pelvic girdle pain that pregnancy-specific exercises, physiotherapy, acupuncture or using a support garment may provide some pain relief.

### Evidence base

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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Evidence supporting recommendation (see Section 59.5)

Pennick & Young 2007; Ee et al 2008; Ekdahl & Petersson 2010; Richards et al 2012; Schiff Boissonnault et al 2012

### Implications for implementation

No implications associated with implementation of the recommendation were identified.

## 9.7 Carpal tunnel syndrome (reviewed 2013)

### NICE recommendation

There is a lack of research evaluating effective interventions for carpal tunnel syndrome. [Evidence summary]

### Research questions

- What is the prevalence and incidence of carpal tunnel syndrome in pregnancy? [Informed narrative]
- What interventions or treatments for carpal tunnel syndrome are effective and safe in pregnancy? [Informed narrative]
- What advice should women receive who are diagnosed with carpal tunnel syndrome? [Informed narrative]
Search strategy
Date of search: 23 September 2011
Publication date range: 2003-2011
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 10
Date of top-up search: 9 April 2013. No additional studies identified.

Review findings
There is insufficient evidence to support a recommendation on interventions, treatments or advice for carpal tunnel syndrome.

Consensus-based recommendation
Advise women who are experiencing symptoms of carpal tunnel syndrome that the evidence to support either splinting or steroid injections is limited and symptoms may resolve after the birth.
## 10 Clinical care in late pregnancy

### 10.1 Fetal presentation (reviewed 2013)

**NICE recommendations**

Fetal presentation should be assessed by abdominal palpation at 36 weeks or later, when presentation is likely to influence the plans for the birth. Routine assessment of presentation by abdominal palpation should not be offered before 36 weeks because it is not always accurate and may be uncomfortable. [C]

Suspected fetal malpresentation should be confirmed by an ultrasound assessment. [Good practice point]

All women who have an uncomplicated singleton breech pregnancy at 36 weeks of gestation should be offered external cephalic version (ECV). Exceptions include women in labour and women with a uterine scar or abnormality, fetal compromise, ruptured membranes, vaginal bleeding and medical conditions. [A]

Where it is not possible to schedule an appointment for ECV at 37 weeks of gestation, it should be scheduled at 36 weeks. [Good practice point]

**Research questions**

**Abdominal palpation**

- What are the predictive and diagnostic accuracy of performing abdominal palpation for determining fetal growth and wellbeing? (Informed narrative on fetal growth and wellbeing)
- What are the benefits and risks of performing an abdominal palpation at each antenatal visit? (Informed narrative on fetal growth and wellbeing)
- At what gestation is abdominal palpation effective and/or accurate? [Informed Recommendation]

**Breech presentation**

- What is the prevalence of breech presentation at term? [Informed narrative]
- What is the optimal gestation to discuss management plans with women who have a breech presentation? [No evidence identified]
- What are the risks of breech presentation at term? [Informed narrative]
- How effective is ECV, and what are the risks and benefits? [Informed Recommendation]
- Other than ECV, what options are available that are effective and safe for women who have a breech presentation nearing term? [Informed narrative]

**Search strategy**

**Abdominal palpation**

Date of search: 29 August 2012
Publication date range: 2003-2012
Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.
Number of references included: 11

Date of top-up search: 6 November 2012
Number of additional references included: 0
**Breech presentation**

Date of search: 6 July 2012

Publication date range: 2003-2011

Databases searched: Medline, Embase, Cochrane, PsychINFO, Cinahl.

Number of references included: 89

Date of top-up search: 2 February 2013

Number of additional references included: 10

**Review findings**

There is no evidence to refute the current NICE recommendation that presentation be assessed by abdominal palpation at 36 weeks or later.

There is no evidence to refute the current NICE recommendation that all women who have an uncomplicated singleton breech pregnancy at 36 weeks of gestation should be offered ECV. Exceptions include women in labour and women with a uterine scar or abnormality, fetal compromise, ruptured membranes, vaginal bleeding and medical conditions.

**EAC recommendation**

Assess fetal presentation by abdominal palpation at 36 weeks or later, when presentation is likely to influence the plans for the birth.

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<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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</table>

Evidence supporting recommendation (see Section 61.8)

Webb et al 2011

**Implications for implementation**

No implications associated with implementation of the recommendation were identified.

**EAC recommendation**

Offer external cephalic version to women with uncomplicated singleton breech pregnancy after 37 weeks of gestation.

<table>
<thead>
<tr>
<th>Evidence base</th>
<th>Consistency</th>
<th>Clinical impact</th>
<th>Generalisability</th>
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<td>B</td>
<td>B</td>
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<td>B</td>
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</table>

Evidence supporting recommendation (see Section 61.8)


**Implications for implementation**

No implications associated with implementation of the recommendation were identified.

**Consensus-based recommendation**

Relative contraindications for external cephalic version include a previous caesarean section, uterine anomaly, vaginal bleeding, ruptured membranes or labour, oligohydramnios, placenta praevia and fetal anomalies or compromise.
## 10.2 Prolonged pregnancy (reviewed 2018)

### Research questions

<table>
<thead>
<tr>
<th>Definition</th>
<th>Q1: What is the definition of post-term pregnancy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harms and benefits</td>
<td>Q2: What are the maternal risks and/or benefits associated with post-term pregnancy?</td>
</tr>
<tr>
<td></td>
<td>Q3: What are the fetal risks and/or benefits associated with post-term pregnancy?</td>
</tr>
<tr>
<td>Intervention</td>
<td>Q4: What options are available for women to prevent post-term pregnancy?</td>
</tr>
<tr>
<td>Additional considerations</td>
<td>Q5: What are the additional needs of Aboriginal and Torres Strait Islander women?</td>
</tr>
<tr>
<td></td>
<td>Q6: What are the additional considerations for migrant and refugee women</td>
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</tbody>
</table>

### Search strategy

As a Cochrane review on induction of labour for improving birth outcomes for women at or beyond term has recently been published, it was agreed that the review be used as the basis for this evaluation of the evidence on prolonged pregnancy. Subsequent to the publication of the Cochrane review a large randomised controlled trial relevant to the topic was published. The review presented to the EWG to inform development of the Guidelines provides a summary of the findings of the Cochrane review updated with the RCT results against the pre-specified research questions.

### Outcomes analysed

Perinatal death, stillbirth, neonatal death, admission to neonatal intensive care unit, Apgar score less than seven at 5 minutes, macrosomia, caesarean section

### Evidence summary

Compared with a policy of expectant management, a policy of labour induction was associated with fewer (all-cause) perinatal deaths (risk ratio (RR) 0.37, 95% confidence interval (CI) 0.10 to 0.87; 15 RCTs, n=8,408, moderate certainty). Fewer babies born to women in the induction group had an Apgar score lower than seven at 5 minutes (RR 0.18, 95% CI 0.13 to 0.24; 12 RCTs, n=7,913; low certainty) and rates were further reduced among women induced at 41 to 42 weeks (RR 0.09, 95% CI 0.06 to 0.14, 1 RCT, n=3,398). Fewer babies born to women in the induction group weighed more than 4,000 g (macrosomia) (RR 0.65, 95% CI 0.53 to 0.79, 8 RCTs, n=4,736, low certainty) and the reduction in macrosomia was higher among women induced at 41° to 41° weeks (RR 0.50, 95% CI 0.37 to 0.66, 6 RCTs, n=1,225). For women in the induction arms of trials, there were fewer caesarean sections compared with expectant management (RR 0.90, 95%CI 0.83 to 0.98; 17 RCTs, n=8,803; moderate certainty).

There were no clear differences between groups for stillbirth (RR 0.34, 95% CI 0.09 to 1.24, 15 RCTs, n=8,404, low certainty), neonatal death (RR 0.37, 95% CI 0.10 to 1.38, 15 RCTs, n=8,408, low certainty) or rates of admission to neonatal intensive care (RR 0.88, 95% CI 0.76 to 1.01, 9 RCTs, n=7,397, low certainty).

### Evidence-based recommendation

Discuss options, including induction of labour, with a woman who is nearing prolonged pregnancy.

### Harms and health benefits associated with the recommendation

**Harms**: No significant harms associated with providing women with information about options in prolonged pregnancy were identified.

**Health benefits**: Prolonged pregnancy is associated with perinatal death. Information about prolonged pregnancy (eg being aware of changes in fetal movements and the potential need for monitoring) allows women to make informed choices about management.

### Implications for implementation

Implementation of the recommendation will be supported by the availability of shared decision-making tools.
## Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANRQ</td>
<td>Antenatal Risk Questionnaire</td>
</tr>
<tr>
<td>BMI</td>
<td>Body mass index</td>
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<tr>
<td>cfDNA</td>
<td>Cell-free deoxyribonucleic acid</td>
</tr>
<tr>
<td>CRG</td>
<td>Cardiotography</td>
</tr>
<tr>
<td>EAC</td>
<td>Expert Advisory Committee</td>
</tr>
<tr>
<td>ECV</td>
<td>External cephalic version</td>
</tr>
<tr>
<td>EPDS</td>
<td>Edinburgh Postnatal Depression Scale</td>
</tr>
<tr>
<td>GBS</td>
<td>Group B streptococcus</td>
</tr>
<tr>
<td>GRADE</td>
<td>Grading of Recommendations, Assessment, Development and Evaluation</td>
</tr>
<tr>
<td>HbA1c</td>
<td>Glycated haemoglobin</td>
</tr>
<tr>
<td>IU</td>
<td>International units</td>
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<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
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<tr>
<td>NICE</td>
<td>National Institute of Health and Clinical Excellence (UK)</td>
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</tbody>
</table>
Related documents

- Clinical Practice Guidelines: Pregnancy Care
- Short-form Guideline
- Administrative Report
- Economic Analyses