An Roinn Sláinte
Department of Health

Stratification of clinical risk in pregnancy

National Clinical Guideline No. 23

Annex A: Systematic review

National Patient Safety Office
Oifig Náisiúnta um Shábháilteacht Othar

NATIONAL CLINICAL EFFECTIVENESS COMMITTEE

HRB Health Research Board

CICER Collaboration in Ireland for Clinical Effectiveness Reviews

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CICER
Collaboration in Ireland for Clinical Effectiveness Reviews

Systematic review of clinical guidelines on risk stratification during pregnancy

September 2017

Health Information and Quality Authority
An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

HRB Health Research Board

NATIONAL CLINICAL EFFECTIVENESS COMMITTEE

RCSI

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Professor Michael Turner	Professor of Obstetrics and Gynaecology, UCD Centre for Human Reproduction, Coombe Women and Infants University Hospital
Dr Karen Power	National Project Manager, Childbirth Guideline Development Group

About HRB-CICER

In 2016, the Department of Health requested the Health Research Board (HRB) to fund a dedicated multidisciplinary research group to support the activities of the Ministerial appointed National Clinical Effectiveness Committee (NCEC). Called HRB-CICER (Collaboration in Ireland for Clinical Effectiveness Reviews), a five-year contract (2017 to 2022) was awarded following a competitive process to the Health Information and Quality Authority (HIQA). The HRB-CICER team comprises a dedicated multidisciplinary research team (including expertise in health economics, qualitative and quantitative research methods and epidemiology) supported by staff from the Health Technology Assessment (HTA) team in HIQA and the HRB Centre for Primary Care Research at the Royal College of Surgeons in Ireland (RCSI), as well as national and international clinical and methodological experts.

Guideline development groups submit clinical guidelines for appraisal and endorsement by the NCEC as National Clinical Guidelines. HRB-CICER provides independent scientific support to guideline development groups tailored according to their specific needs. The main role of the HRB-CICER team is to undertake systematic reviews of the clinical effectiveness and cost-effectiveness of interventions included in the guidelines and to estimate the budget impact of implementing the guidelines. Additional support can be provided by HRB-CICER to guideline development groups including; providing tailored training sessions and working closely with the guideline development groups to develop clinical questions and search strategies; performing systematic reviews of international clinical guidelines; supporting the assessment of suitability of clinical guidelines for adaption to Ireland and assisting in the development of evidence-based recommendations.

Members of the Evaluation Team

Members of HRB-CICER's evaluation team were Barrie Tyner (project lead), Michelle O'Neill, Paul Carty, Dr Barbara Clyne, Prof Susan Smith and Dr Máirín Ryan.

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List of abbreviations used in report

ADAPTE	A systematic approach to guideline adaptation
AETSA	Andalusian Agency for Health Technology Assessment
AGREE II	Appraisal of Guidelines for Research and Evaluation instrument V.2
AHMAC	Australian Health Ministers' Advisory Council
AHRQ	Agency for Healthcare Research and Quality
AJOG	American Journal of Obstetrics and Gynaecology
ANC	Antenatal care
BSH	British Society for Haematology
DoH	Department of Health, Ireland
GAIN	Guidelines and Audit Implementation Network
GDG	Guideline development group
HSE	Health Service Executive, Ireland
ICSI	Institute for Clinical Systems Improvement
KCE	Belgian Health Care Knowledge Centre
NCEC	National Clinical Effectiveness Committee, Ireland
NICE	The National Institute for Health and Care Excellence, England and Wales
PICO	Population, Intervention, Comparison and Outcomes of interest
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT	Randomised controlled trial
SEMFyC	Spanish Society of Family and Community Medicine
QCG	Queensland Clinical Guidelines
USPSTF	U.S. Preventive Services Task Force
WHO	World Health Organisation

1 Introduction

Creating a Better Future Together: National Maternity Strategy 2016–2026, published in February 2016, advocates a risk-based approach to ensure that women are provided with the most appropriate model of care in line with their clinical risk.[1] The Strategy highlighted the need to stratify pregnant women according to their clinical risk into three risk groups: normal-risk, medium-risk and high-risk. Following publication of the National Maternity Strategy Report, the Minister for Health mandated as a matter of priority the commissioning and quality assurance of prioritised national guidelines through the National Clinical Effectiveness Committee (NCEC) to support its implementation.

At the first meeting of the Childbirth Guideline Development Group (GDG) in June 2017, the scope of the first of a suite of clinical guidelines to be developed to support the implementation of the National Maternity Strategy was agreed. The guideline would focus on how to stratify women according to risk during the antenatal period. This would include stratification at the initial antenatal appointment and during all subsequent antenatal appointments. Stratification of risk during labour or post birth would not be considered within this clinical guideline.

The purpose of this review is to provide a synthesis of the clinical guidelines that include stratification of risk during pregnancy within their scope, with the key objectives being to identify and appraise eligible clinical guidelines which stratify a woman's risk during pregnancy. This is to inform the GDG discussions as to whether quality clinical guidelines exist which are similar to the agreed scope and could, thus, be adapted for the Irish setting or, alternatively, if a new clinical guideline (de nova) will need to be developed.

2 Methods

2.1 Search strategy

A search strategy was developed (see Appendix A: Search strategy) to identify relevant clinical guidelines of risk in pregnancy at the initial antenatal appointment and during the antenatal period. A conservative approach was adopted to capture as many relevant clinical guidelines as possible. The search strategy was based on a recent systematic review that aimed at mapping current clinical guidelines in antenatal care.[2] A combination of appropriate medical subject headings (MeSH) terms and free text words were used based on the PICOS (Population, Intervention, Comparison, Outcome, and Study design) framework outlined in Table 2.1.

Table 2.1. PICOS framework for identification of relevant clinical guidelines of risk in pregnancy

Population	Pregnant women during the antenatal period
Intervention	Stratification or identification (through screening, and or diagnostic tests) of the following risks: ▪ Risk based on maternal characteristics which are not modifiable (for example, age, parity or ethnicity) ▪ Risk based on medical history (for example, diabetes, congenital anomaly, HIV, epilepsy or obesity) ▪ Risk based on previous obstetric history (for example, previous caesarean section, previous perineal tear or previous shoulder dystopia) ▪ Risk based on family history ▪ Risk based on modifiable risk factors (for example, smoking, alcohol or illicit drugs) ▪ Risk based on clinical exams during pregnancy – relating to the health of the foetus (for example, chromosomal anomalies or foetal growth)

	– other risk factors (for example, anaemia <9g/dl, multiple pregnancy or development of rhesus antibodies).
Study design	National or regional clinical guidelines

Database searches within PubMed and Embase were performed on the 6 June 2017. Grey literature sources were searched from 6 June 2017 to 20 June 2017 and periodically again until 1 September 2017. Grey literature sources included guideline repositories, guideline developer websites and websites of national ministries of health. The full list of grey literature sources is provided in Appendix A. In addition, Guideline Development Group members identified clinical guidelines from their national and international links.

Eligibility criteria included clinical guidelines published from 2007 onwards and available in the English language. Citations returned from searches were screened by one reviewer, first by title, then by abstract to eliminate clearly irrelevant documents. Selected full-text articles were reviewed against the full inclusion and exclusion criteria (see Table App A.1).

2.2 Data extraction and quality appraisal

Data extracted included the criteria used by the clinical guidelines to stratify women according to clinical risk, details on the evidence base used to inform the recommendations and clinical questions addressed. Where an update to a clinical guideline was available, the update was considered as the primary document. When supplementary or legacy documents were referenced all effort was made to locate and include them.

Eligible clinical guidelines were independently appraised by two reviewers using the Appraisal of Guidelines for Research and Evaluation (AGREE II) quality appraisal tool,[3] with any disagreement resolved by discussion. The AGREE II Instrument assesses the methodological rigour and transparency with which a clinical guideline is developed.

3 Results

3.1 Search results

From 1,608 unique identified citations (see Appendix B: PRISMA flow diagram) seven clinical guidelines[4-11] met the inclusion and exclusion criteria (Table App 1) and are included within the review (Table 3.1). Four of the clinical guidelines were from European settings, namely, Northern Ireland,[6] England and Wales,[10] Spain[8] and Belgium[7]; two from Australia[5, 9, 11] and one from an international public health agency.[4]

Table 3.1. List of clinical guidelines included within the review

Country	Clinical guideline title	Publication date
Australia	Clinical Practice Guidelines: Antenatal Care – Modules 1[9] and 2[11]	2012 and 2014
Belgium	What are the recommended clinical assessment and screening tests during pregnancy?[7]	2015
England and Wales	Antenatal care for uncomplicated pregnancies[10]	2008
Northern Ireland	Guideline for admission to midwife-led units in Northern Ireland and Northern Ireland normal labour and birth care pathway[6]	2016
Queensland, Australia	Queensland Clinical Guidelines: Non-urgent referral for antenatal care operational framework[5]	2016
Spain	Clinical Practice Guideline for Care in Pregnancy and Puerperium[8]	2014
World Health Organisation	WHO recommendations on antenatal care for a positive pregnancy experience[4]	2016

3.2 Overview of clinical guidelines

This section gives an overview of the seven clinical guidelines included within the review.[4-11] The summary for each clinical guideline includes the publication date, the aims and objectives, the target audience and target population. The methodology used in developing the guideline is also described, including how the evidence was assessed and the dates of the most recent searches. Risk assessment or any risk factors included within the clinical

guidelines are summarised. For each guideline, a brief overview of the quality is included below. However, Section 3.4 considers the quality in more detail.

Australia: Clinical Practice Guidelines: Antenatal Care – Module 1 and 2[9, 11]

The Australian national clinical guideline for antenatal care (AHMAC 2012 and 2014) was undertaken in two modules.[9, 11] Module one published in 2012 covers clinical topics that are largely specific to the first trimester, although the timing of a woman's first antenatal contact and the availability of services may mean that some of the clinical assessments or screening tests discussed are carried out later in pregnancy. Module two published in 2014 covers some topics that are relevant to the first trimester, later stages of pregnancy or throughout pregnancy. Both modules are aimed at healthy pregnant women with uncomplicated pregnancies with additional consideration for population groups with specific care needs, such as indigenous women and women in rural and remote areas.

The clinical guideline covers antenatal care in both the community and hospital-based settings. It is guided by the 1998 WHO Principles of Perinatal Care[12] and motivated by the need to reduce variation in screening practice and to improve evidence-based practice in the provision of antenatal care.

Assessment of a woman's risk and need for additional care is recommended at the initial antenatal appointment and should continue throughout pregnancy. Risk assessment is explicitly discussed in the context of weight management, domestic violence and foetal chromosomal abnormalities. Risk factors are also identified for women who may require additional care. These were adapted from the NICE 2008 clinical guideline[10] and are listed in Appendix D.

The methodology used followed the ADAPTE process.[13] Following a systematic search for high-quality clinical guidelines, the NICE 2008 clinical guideline[10] was selected as the reference clinical guideline. Clinical questions were extracted from NICE 2008 and modified to suit their aims, with new clinical questions formed to answer questions not covered in NICE 2008. Clinical questions covered four broad topics: clinical assessment, screening, lifestyle considerations and other aspects of antenatal care, which included education, external cephalic version and post dates pregnancy.

Systematic searches were conducted for all clinical questions, with an update performed for those based on NICE 2008. The systematic searches were performed for Module 1 between February 2009 and March 2011 and for Module 2 between April 2011 and January 2013

All evidence was graded according to an adapted form of the *NHMRC Levels of Evidence and Grades for Recommendations for Developers of Guidelines.*[14] Consensus-based recommendations were formulated when no good-quality evidence was identified. Practice points were also developed to cover areas that were beyond the scope of the systematic reviews.

Before publication, a public consultation on the draft clinical guidelines was undertaken, with all submissions on the clinical guidelines considered and recommendations revised accordingly. An update of this clinical guideline is now at the public consultation stage with formal publication due later this year.

This clinical guideline was considered to be high quality and when appraised using the AGREE ll tool achieved 100% in the overall guideline assessment item. It appeared to be well informed with direct links to the evidence. Regarding the domain of rigour of development, it scored 92% as systematic reviews based on clearly defined clinical questions were performed and comprehensively documented. The evidence was graded and summary of findings tables documented. Consensus methods were applied and the process documented, although it was unclear whether the DELPHI[15] approach was used.

Belgium: What are the recommended clinical assessment and screening tests during pregnancy?[7]

Published in 2015, the Belgium national clinical guideline (KCE 2015) is an update of a previous clinical guideline for antenatal care, first published in 2004.[7] It covers the pregnancy period from the initial antenatal appointment up until giving birth. The clinical guideline offers information on best practice for baseline clinical care for all pregnant women and comprehensive information for the follow-up of low-risk women. WHO principles[12] of evidence-based care, promoting the use of appropriate technology and locally available, multi-disciplinary and holistic antenatal care, are emphasised.

A woman with a low-risk pregnancy is defined as one who does not have identified risk factors, known pre-existing conditions or complications requiring additional tests or adapted management. To define these risk factors the Belgium guideline development group (GDG) used the risk factors from the Belgium 2004 clinical guideline (KCE 2004), the NICE 2008 clinical guideline and AHMAC 2014. These risk factors were considered by the GDG members, and the final list produced took into account the GDG comments and those of the wider stakeholders. These can be found in Appendix D.

The methodology employed by the Belgium clinical GDG followed the ADAPTE approach.[13] A literature review was conducted for recent, high-quality clinical guidelines in October 2013. The AHMAC 2014[11] clinical guideline was chosen as the primary reference clinical guideline because it was the most recent, and NICE 2008[10] as the secondary reference clinical guideline.

Clinical questions were developed and the inclusion and exclusion criteria defined. Clinical questions were a mix of 24 existing clinical questions retained from KCE 2004[16] and 10 new clinical questions proposed by the GDG. Many of these new questions relate to the use of tests to screen for or establish the diagnosis of a certain condition or disease.

The evidence provided by the AHMAC 2014 clinical guideline was extracted for the 24 existing clinical questions to be updated, encompassing the included studies, the conclusions and the level of evidence. The corresponding AHMAC clinical recommendations and the strength of each recommendation were also extracted. Where no evidence was provided by the AHMAC 2014 clinical guideline, the NICE 2008 clinical guideline or other sources referred to by the AHMAC 2014 clinical guideline (such as Royal College of Obstetricians and Gynaecologists from United Kingdom) were used.

The systematic searches for evidence were conducted between April 2014 and November 2014 and were limited to English, Dutch, and French languages in Medline and Embase.

The quality of the evidence that met the eligibility criteria was assessed using appropriate tools for different study designs (AMSTAR checklist for systematic reviews,[17] the Cochrane risk of bias tool for radomised controlled trials,[18] a generic assessment for observational studies or the QUADAS-2 checklist[19] for diagnostic accuracy studies). The quality of the

'body of evidence' was classified using GRADE[20] into four categories: high, moderate, low, and very low. An update is planned for 2020.

This clinical guideline, was considered to be high quality and received 100% in the overall guideline assessment item according to the AGREE ll tool appraisal. All required components were addressed and documented in a transparent and accessible way. The domain concerning rigour of development received a score of 98%, as comprehensive systematic searches were performed and documented, with a clear description of the selection criteria and the strengths and limitations of the evidence. The methods for formulating recommendations, the health benefits and potential side effects were also clearly described. The clinical guideline was externally reviewed, and the impact this had on the final result is clearly documented.

Northern Ireland: Guideline for admission to midwife-led units in Northern Ireland and Northern Ireland normal labour and birth care pathway[6]

The Northern Ireland clinical guideline was published in 2016 (GAIN 2016) to standardise eligibility criteria for admission to midwife-led units (alongside midwifery units or freestanding midwifery units). The clinical guideline is intended for women with a straightforward pregnancy at all stages of their antenatal care, up to and including the onset of labour and birth.

A straightforward pregnancy is defined as "a singleton pregnancy, in which the woman does not have any pre-existing condition impacting on her pregnancy, a recurrent complication of pregnancy or a complication in this pregnancy which would require on-going consultant input, has reached 37 weeks gestation and ≤ Term +15".[6]

A risk assessment tool was developed to assist women and maternity care providers in their decision-making with regard to care pathways for women with a straightforward singleton pregnancy. This tool was developed starting with 20 criteria considered and agreed by the GDG to be relevant to assessing risk/suitability in relation to care pathways. After the criteria were agreed, clinical questions were developed based on these and searches for evidence performed.

Women who are within thresholds based on a series of risk factors (Appendix D) are considered suitable to enter a midwife-led care pathway. Further criteria were developed to assess whether for women meeting these thresholds, an alongside midwifery or a free standing midwifery unit is most suitable.

The clinical questions are not documented within the clinical guideline, and it is not clear if the review performed was systematic. Searches for evidence were undertaken from between January 2009 to November 2014. The clinical guideline was developed as the result of an in-depth iterative process, which utilised expert professional, experiential knowledge and a range of evidence. It is not clear if the evidence was assessed for quality or whether a standardised and validated tool for grading the totality of the evidence was used.

The Northern Ireland clinical guideline received an overall assessment score of 75% using the AGREE ll tool. There was a lack of applicability (33%) and low rigour of development (48%). It was unclear if the search for evidence was systematic, and there was no documentation of search terms, PICO questions, search strategy or PRISMA flowchart. Also absent is a standard validated method for grading the evidence, a description of the consensus methods used and documentation of the linkage between evidence and recommendations, which appears to depend largely on expert judgement of the GDG but this is not explicitly stated.

England and Wales: Antenatal care for uncomplicated pregnancies[10]

The England and Wales clinical guideline was first published in 2003 (NICE 2003), with an update in 2008 (NICE 2008). Further evidence updates were performed in 2014, with an updated systematic search for evidence and a reduced supplementary document developed to accompany NICE 2008, featuring new recommendations and the evidence to support them.

The NICE 2008 clinical guideline on antenatal care for uncomplicated pregnancies covers the period from the initial antenatal appointment through the antenatal period. Birth[21] and the postpartum[22] period are covered in separate clinical guidelines.

It is aimed at women exhibiting an uncomplicated singleton pregnancy and offers evidence-based recommendations on woman-centred care and informed decision making, provision and organisation of care, lifestyle considerations, management of common symptoms, clinical examinations, screening tests, fetal growth and wellbeing, and management of specific conditions. Although the clinical guideline addresses screening for many of the complications of pregnancy, it does not include information on the investigation and appropriate ongoing management of these complications if they arise in pregnancy. A list of risk factors that usually require additional care is given. These first appeared in NICE 2003 and remained unchanged in NICE 2008. It is unclear how this list was developed. They are provided in Appendix D.

The scope of NICE 2008 included the development of a questionnaire that enables healthcare professionals to assess the needs and risks of women during the antenatal period and allows the correct care pathway to be offered. Following three rounds of a 'national consensus approach' (modified Delphi technique), a list of 14 possible topics for inclusion were drawn from expert opinion, systematic reviews of the literature and a sample of antenatal booking notes. Multicentre validation studies were stated to be required to validate and evaluate these; however, the progress of these validation studies is unclear.

The methodology used in developing the NICE 2008 clinical guideline involved forming a GDG with relevant stakeholders, including patient representatives. Following this, clinical questions were agreed and systematic searches performed. Relevant quality appraisal checklists were used to assess the quality of evidence. The GRADE approach[20] was followed for presenting evidence, although recommendations were not graded in NICE 2008 or subsequent updates. Recommendations were made on the basis of best evidence through formal consensus rounds using the DELPHI method[15] when required. An update is planned for 2017.

This clinical guideline was considered to be high quality, with an overall assessment score was 92% using the AGREE II tool. In terms of rigour of development, it received 95%. Systematic methods were used to search for evidence and appear comprehensive. Search strategies are included in an accompanying document with search terms, dates and sources of searches, and any filters used. Evidence criteria appeared to be quite broad during the

search phase, but the data extraction process was comprehensive and used a number of different tools to rate the evidence, all of which are listed. Evidence tables are documented. The methods for formulating the recommendations are clearly described.

Queensland, Australia: Non-urgent referral for antenatal care[5]

Queensland Clinical Guidelines developed an operational framework for non-urgent referral for antenatal care which was published in 2016 (QCG 2016).[5] This document is aimed at pregnant women who need a referral to a higher level service. It offers a standardised assessment and referral pathways for pregnant women. The clinical guideline describes itself as 'evidence informed consensus guidelines' as it draws from the evidence base of existing national and international guidelines and from systematic searches of databases. Due to a stated lack of evidence, all the recommendations listed in the clinical guideline are based on the expert consensus of the working party**.**

Risk factors are not explicitly discussed. Neither is a risk assessment tool. A flow chart for non-urgent antenatal transfer is presented, but it is generic. Furthermore, while it includes an initial question "risk/concerns identified?", it lacks clear instructions on how these should be identified or assessed.

The methodology used included identifying topics, deciding clinical questions and performing searches for existing high-quality clinical guidelines. The literature was searched for evidence relating to the clinical questions between February 2010 and December 2010, with a further update performed in April 2016. Major consultative and development processes occurred between January 2010 and October 2010 involving consumer participation and a state-wide consultation of clinicians and stakeholders.

Although the process is stated to follow a rigorous methodology, when appraising the clinical guideline the AGREE ll tool overall assessment score given was 67%. There was a lack of transparency in how each step of development was carried out. The domain relating to rigour of development was given a score of 48%. Items that were particularly lacking were describing the strengths and limitations of evidence, detailing the methods for formulating the recommendations and linking the recommendations to the supporting evidence.

Spain: Clinical practice guideline for care in pregnancy and puerperium[8]

The Spanish national clinical guideline on care in pregnancy and puerperium (AETSA 2014) aims to provide both information about the best clinical practice for referral care of all pregnant women and extensive information on care during pregnancy for an uncomplicated singleton pregnancy in healthy women.

A healthy woman is defined to be not suffering from a disease or a complication during pregnancy, such as hypertensive disorders of pregnancy, intrauterine growth restriction, multiple pregnancy or induction of labour, which might require extra care. These situations or risk factors are listed in the clinical guideline and are designed to be used as indications when a pregnant woman needs additional care (see Appendix D). The evidence source for this list is not provided.

The clinical guideline follows the ADAPTE methodology.[13] Four clinical guidelines were used as secondary sources: NICE — Postnatal Care 2006,[23] NICE — Antenatal Care 2008,[10] Institute for Clinical Systems Improvement — Prenatal Care, Routine 2010[24] (now retired) and a fourth listed as Bailon 2002. No further information was given in relation to this last guideline and, consequently, it cannot be properly identified. For each recommendation, the latest systematic reviews were extracted from the reference guidelines. These were updated and additional searches conducted to answer clinical questions where gaps were identified in the literature during the initial stages. Searches were performed from February 2012 to October 2012. The evidence was classified according to the GRADE approach.[20]

The clinical guideline was written in Spanish and later translated into English. The English version used for this appraisal is not the full version and some sections relating to the search strategy and possibly other key relevant details may be missing.

AETSA 2014 received an overall assessment score of 75% using the AGREE ll appraisal tool. The domains concerning the scope and purpose, stakeholder involvement, rigour of development and clarity of presentation all received 70% or more. Domain 3 covering rigour of development lacked transparency, especially in the documentation of the process from systematic review results to recommendations.

World Health Organisation (WHO): WHO recommendations on antenatal care for a positive pregnancy experience[4]

Published in November 2016, the WHO guideline is a comprehensive clinical guideline on routine antenatal care for pregnant women and adolescent girls. The aim of this guideline is to complement existing WHO guidelines on the management of specific pregnancy related complications, with the included recommendations intended to inform the development of relevant national- and local-level health policies and clinical protocols. Although predominantly focused on medium to low resource settings, it is also applicable to high resource settings.

There is no reference to risk assessment tools but risk identification is explicitly mentioned as an important component of antenatal care. The WHO clinical guideline is presented in five sections: nutritional interventions, maternal and fetal assessments, preventable measures, interventions for common physiological symptoms and health systems interventions to improve the utilisation and quality of antenatal care.

A comprehensive and systematic mapping exercise of existing guidelines was carried out in April 2014, retrieving 15 antenatal care clinical guidelines and 70 specific situations clinical guidelines.[25] An existing up-to-date clinical guideline that was adaptable to the different resource settings was not identified. Information on the scope of each clinical guideline, type of practice, associated gestational age, recommendation type and the source of evidence were extracted. The corresponding evidence, mostly systematic reviews, was updated if required and appraised using the GRADE approach.[20] The Developing and Evaluating Communication Strategies to support Informed Decisions and Practice based on Evidence (DECIDE) framework,[26] an evidence-to-decision tool that includes intervention effects, values, resources, equity, acceptability and feasibility criteria, was used to guide the formulation and approval of recommendations by the GDG. This led to the development of 39 recommendations based on mapping exercise and 10 additional recommendations from existing WHO guidelines.

The Agree II appraisal scores reflect the high quality of this clinical guideline. Overall assessment was 100%. Each of the domains also achieved an assessment score of 100% except for the two domains concerned with rigour of development (96%) and applicability

(83%). General comments include a note regarding a failure to consider cost-effectiveness, conduct de novo economic evaluations or carry out a budget impact analysis. However, as this clinical guideline is aimed at a variety of resource settings this is understandable.

3.3 Currency

Four of the seven included clinical guidelines are based on evidence reviews conducted within the last three years (Table 3.2). It is also clear that there is considerable overlap in the evidence base to support these clinical guidelines, where in all cases they have been developed building upon previously published guidelines.

Table 3.2. Most recent search for evidence for each clinical guideline and reference guidelines used

Clinical Guideline	Most recent search	Reference clinical guideline(s)
KCE 2015[7]	July 2014	AHMAC 2014 and NICE 2008
WHO 2016[4]	August 2014	NICE 2008, ICSI 2012, AHMAC 2012
AHMAC 2012[9]and 2014 [11]	November 2010 and July 2012	NICE 2008
NICE 2008[10]	December 2012	NICE 2003
AETSA 2014[7]	October 2012	NICE 2008 and ICSI 2012 Routine Prenatal Care
QCG 2016[5]	April 2016	AHMAC 2012 2014, National Midwifery Guidelines for Consultation and Referral 3rd Edition Issue 2
GAIN 2016[6]	November 2014	NICE 2008

Key: AHMAC — Australian Health Ministers' Advisory Council; AETSA — Andalusian Agency for Health Technology Assessment; ICSI — Institute for Clinical Systems Improvement, US; NICE — National Institute for Health and Care Excellence, England and Wales; GAIN — Guidelines and Audit Implementation Network, Northern Ireland; KCE — Belgian Health Care Knowledge Centre; QCG — Queensland Clinical Guidelines; WHO — World Health Organsiation.

3.4 Quality appraisal

In this section, the included clinical guidelines are examined in the context of rigour, comprehensiveness and transparency of development. This quality appraisal (conducted using AGREE ll) aids in identifying which clinical guidelines may be suitable for consideration in the ADAPTE process.[13] A full summary of AGREE ll scores for each of the included clinical guidelines is presented in Table 3.3. Of particular interest is the formulation of clinical questions; documentation of full search strategy with search terms, dates and sources; and the availability of evidence tables, including quality appraisal of evidence and the presentation of summary of findings. These elements are captured within Domain 1 (Scope and Purpose) and Domain 3 (Rigour of Development) of the AGREE ll tool, and these are discussed in detail for each clinical guideline.

Table 3.3. AGREE ll scaled domain and overall assessment scores

Clinical guideline	Domain 1 Scope and purpose	Domain 2 Stakeholder involvement	Domain 3 Rigour of development	Domain 4 Clarity of presentation	Domain 5 Applicability	Domain 6 Editorial independence	Overall Guideline assessment
AHMAC 2012[9]and 2014[11]	89%	100%	93%	92%	94%	100%	100%
KCE 2015[7]	100%	86%	98%	97%	81%	92%	100%
NICE 2008[10]	89%	89%	95%	100%	90%	63%	92%
GAIN 2016[6]	75%	86%	53%	86%	33%	79%	67%
QCG 2016[5]	83%	83%	48%	100%	52%	67%	75%
AETSA 2014[7]	97%	89%	74%	86%	54%	67%	75%
WHO 2016[4]	100%	100%	96%	100%	83%	100%	100%

Key: AHMAC — Australian Health Ministers' Advisory Council; AETSA — Andalusian Agency for Health Technology Assessment; NICE — National Institute for Health and Care Excellence, England and Wales; GAIN — Guidelines and Audit Implementation Network, Northern Ireland; KCE — Belgian Health Care Knowledge Centre; QCG — Queensland Clinical Guidelines; WHO — World Health Organsiation.

3.3.1 Definition of objectives, target audience and clinical questions

Domain 1 (Scope and Purpose) of the AGREE ll tool assesses whether the overall objectives of the guideline, the clinical questions covered by the guideline and the population to whom the guideline is meant to apply are specifically described.

The aims and target population of each clinical guideline have been described in Section 3.2; this section focuses only on clinical questions and their availability for adapting by a GDG. However, it is important to note that the overall score presented for Domain 1 is a reflection of the definition of all three components (and not simply that of the clinical questions).

All seven clinical guidelines identified in this review state that they develop or use clinical questions to inform their literature search, with five out of the seven listing these questions.[4, 7-11] The PICO (population, intervention, comparison and outcome) framework is a widely used structured approach for developing questions. Four of the clinical guidelines adopted the PICO framework when defining their clinical questions.[4, 6-8]

Each clinical guideline's AGREE ll scores for this domain are discussed below, with reference to the clinical questions and their availability for use by other guideline development groups. All clinical questions that are within the scope of this review have been extracted and are presented in Appendix D.

AHMAC 2012 and 2014 (AGREE ll Domain 1 score: 89%)

- The clinical guideline contained 26 clinical questions relating to risk assessments, risk factors and screening. These were based on the relevant clinical questions used in the NICE 2008 clinical guideline.

KCE 2015 (AGREE ll Domain 1 score: 100%)

- The clinical guideline listed 34 clinical questions — 24 from the KCE 2004 clinical guideline and 10 new questions. These clinical questions relate to screening tests, the diagnosis of a certain condition or disease and the monitoring of vital statistics such as BMI and blood pressure.

GAIN 2016 (AGREE ll Domain 1 score: 75%)

- Although it is stated that clinical questions were used to inform the literature search, the clinical questions are not listed nor is a structured framework for defining the clinical questions presented. It was stated that the clinical questions were based on a

list of 20 criteria, agreed by the GDG to be relevant in assessing risk in relation to appropriate care pathways.

NICE 2008 (AGREE ll Domain 1 score: 89%)

- The NICE 2008 clinical guideline includes nine clinical questions which are within the scope of this review. They are concerned with the safe level of alcohol consumption during pregnancy and the benefits and effectiveness of screening methods for certain conditions and risk factors.

QCG 2016 (AGREE ll Domain 1 score: 83%)

- The QCG 2016 clinical guideline chose four broad questions and did not define these in line with the PICO framework. These broad questions then appeared to inform the development of more specific clinical questions which, as stated in the clinical guideline, were in PICO format. These clinical questions were not listed in the clinical guideline document.

AETSA 2014 (AGREE ll Domain 1 score: 97%)

- There was a clear description of clinical questions. The clinical guideline incorporates 36 clinical questions. Of these, 25 relate to screening, six to diagnoses/clinical assessments and five to risk factors.

WHO 2016 (AGREE ll Domain 1 score: 100%)

- The clinical guideline includes eight clinical questions within the scope of this review. Five relate to screening and three to diagnostic tests. The PICO format was used for each clinical question, all of which are clearly documented.

3.3.2 Availability of full search strategy, evidence tables and summary of findings

Domain 3 (Rigour of Development) of the AGREE ll tool relates to the processes used to gather and synthesis the evidence and the methods used to formulate and update the recommendations. The key findings relevant to each clinical guideline under this domain are described below.

AHMAC 2012 and 2014 (AGREE ll Domain 3 score: 93%)

- There was a high standard of rigour and transparency in the reporting of the guideline development process. The GDG, who followed the ADAPTE process, chose the NICE 2008 clinical guideline (identified through a systematic search) as the reference clinical guideline for adaptation. For most of the clinical areas under consideration, the relevant research questions were included in the NICE 2008 clinical guideline. The studies identified by NICE were included in the evidence tables and regraded using the standard Australian method of grading evidence.[14] New searches were then conducted to update the literature review. The search dates, search terms, exclusion/inclusion criteria, databases searched, filters and any limits used are comprehensively documented. The findings of each review are presented with recommendations and their supporting references.

KCE 2015 (AGREE ll Domain 3 score: 98%)

- This clinical guideline followed the ADAPTE process, systematically searching for existing clinical guidelines suitable for adaptation. The AHMAC 2012 and 2014 clinical guideline was chosen as the reference clinical guideline with the NICE 2008 clinical guideline acting as a secondary reference.
- For the 24 existing clinical questions, the original KCE 2004 recommendations are documented and included in a summary of recommendations, which includes the corresponding evidence quoted by the AHMAC 2014 clinical guideline (or, if lacking, then NICE 2008) and the quality of evidence given. The AHMAC 2014 (or NICE 2008) recommendation is also given along with the corresponding grade of recommendation. These are then followed by the KCE recommendation and the results of consensus discussions (by the Belgium GDG) about the recommendations and associated evidence.
- For the 10 new clinical questions, search strategies were constructed and are comprehensive and thoroughly documented. Quality appraisal results, evidence tables and summary of findings table with GRADE profiles are also comprehensively documented and presented.

GAIN 2016 (AGREE ll Domain 3 score: 53%)

- A search strategy is documented but it is not comprehensively described. Search dates, exclusion/inclusion criteria and databases searched are given; however, search terms, filters, limits and PRISMA flowchart were not documented.
- Evidence tables featuring identified primary studies, systematic reviews and clinical guidelines are provided for each of the 20 criteria listed as possible risk factors. These tables are the result of literature searches carried out between January 2009 and November 2014. The evidence listed was not assessed for quality, but comments from the GDG are included. Neither a summary of findings nor GRADE tables are provided.

NICE 2008 (AGREE ll Domain 3 score: 95%)

- A comprehensive search strategy is documented. Search terms, dates, filters, limits, exclusion/inclusion criteria and databases searched are all listed for each clinical question and topic.
- The clinical guideline documentation provides comprehensive evidence tables for each version of the NICE 2008 clinical guideline, the grading method applied and the quality of each study. Additionally, the evidence synthesis methods are transparently described, and feedback and actions resulting from stakeholder involvement and public consultation are presented.

QCG 2016 (AGREE ll Domain 3 score: 48%)

- The documented search strategy is limited but does provide search dates, sources and limits. The clinical questions were very broad, and the associated search terms are not listed. Furthermore, the inclusion/exclusion criterion is not provided.
- The clinical guideline presents neither evidence tables nor grading of the body of evidence. As such, it is unclear whether any quality appraisal tool was used in rating the evidence that informed the recommendations.

AETSA 2014 (AGREE ll Domain 3 score: 70%)

- Dates of searches, databases searched and any limits used were provided. However, search terms, inclusion exclusion criteria, outcomes of interest and a PRISMA flowchart detailing results were absent from the clinical guideline.
- The GRADE system was used to assess the quality of the evidence and a summary of evidence for each recommendation was provided. This includes the source of the evidence (randomised controlled trial, systematic review or another clinical guideline) and the associated level of evidence and strength of recommendation. However, the evidence tables are not provided.

WHO 2016 (AGREE ll Domain 3 score: 100%)

- The strategy specified search terms, dates of searches, databases searched (including grey literature sources) and detailed any restrictions that were applied. Additionally, a PRISMA flowchart was presented, and inclusion/exclusion criteria were defined.
- The clinical guideline development process employed the GRADE approach with a GRADE profile prepared for each quantitative outcome within each clinical question. These include important study design elements, effect estimates and the quality assessments for each included study.

4 Conclusion

The key objectives of this review were to identify and appraise eligible clinical guidelines which stratify a woman's risk during pregnancy. Seven clinical guidelines were identified that cover the antenatal period period from the initial antenatal appointment and include a consideration of risk in pregnancy.

The quality of the clinical guidelines were assessed using a validated appraisal tool. Four clinical guidelines (AHMAC 2012 and 2014, KCE 2015, NICE 2008 and WHO 2016) emerged as being of very high quality. In particular, these four offered the availability of precise clinical questions, comprehensive search strategies and graded evidence tables. These are the required components when considering using an existing clinical guideline for the adaption process. Two of these four clinical guidelines (KCE 2015, WHO 2016) were informed by evidence bases gathered in the last three years. With the other two guidelines in the process of being either reviewed or updated. AHMAC 2012 and 2014 completed a public consultation on a draft version in June 2017. Seven topics from Modules 1 and 2 were identified for review (domestic violence, hepatitis C, vitamin D, fetal growth and wellbeing, risk of pre-eclampsia, risk of preterm birth and thyroid dysfunction). New evidence on cell-free DNA testing, illicit substance use, monitoring of weight gain and early testing for diabetes has been included. It is planned that the remaining topics will be updated next and Modules 1 and 2 will be combined to form a single set of consolidated guidelines. NICE 2008 is stated to be scheduled for a full update in 2017; however, no further details are available regarding publication date.

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Appendix A: Search strategy

The following outlines the search strategy that was used to identify clinical guidelines that include within their scope stratifying a woman's risk during pregnancy, including the first antenatal appointment and all subsequent antenatal appointments. The processes outlined in the National Clinical Effectiveness Committee guideline developer's manual were followed and are described below.[27]

National or regional clinical guidelines, covering the period from first antenatal appointment up to intrapartum, published in English, from 2007 or later were considered within scope (see Table App A.1. Inclusion and exclusion criteria).

Table App A.0.1. Inclusion and exclusion criteria

Inclusion	Exclusion
Clinical or Regional guidelines (based on a systematic review of evidence)	Consensus statements, consensus development, decision making or decision aid, systematic reviews, clinical trials, editorials and letters, and documents that are available in abstract only
Initial Antenatal appointment and antenatal period	Intrapartum and postpartum period
Published between 2007 and June 2017	Focuses on low resource settings
Available in English	Management and Treatment options

The search strategy was adapted from that used by WHO 2016.[4] Searches were performed within PubMed and Embase databases on the 6 June 2017. Search strings included free text, MeSH terms and filters specific for clinical guidelines, see Table App 2 Search strings.

Grey literature sources were searched from 6 June 2017 to 20 June 2017 and periodically again until 1 September 2017. Grey literature sources included guideline repositories, guideline developer websites and websites of national ministries of health. The full list of grey literature sources is provided below. In addition, GDG members identified clinical guidelines from their national and international links.

The following sources were included within the search.

Guideline repositories:

- NHS Evidence database (UK)
- US National Clearing House
- eGuidelines (UK)
- United States National Guideline Clearinghouse
- the Guidelines International Network
- NLH (National Library of Guidelines UK).

National health ministry websites and other publishers of guidelines:

- Australian National Health and Medical Research Council Clinical Practice Guidelines
- Canadian Medical Association InfoBase of Clinical Practice Guidelines
- New Zealand Guidelines Group
- NICE (The National Institute for Health and Care Excellence, UK)
- NCEC (National Clinical Effectiveness Committee, Ireland)
- the Institute for Healthcare Improvement (USA)
- the Scottish Intercollegiate Guidelines Network
- Japan Council for Quality Health
- CMA Infobase (Canadian Medical Association)
- ANHMRC (Australian National Health and Medical Research Council)
- Danish Secretariat for Clinical Guidelines
- ACOG (The American Congress of Obstetricians and Gynecologists)
- JOGC (Journal of Obstetrics and Gynaecology Canada)
- Singapore Ministry of Health
- Socialstyrelsen (Health and Medical Care and Social Services, Sweden)
- The Finnish Medical Society Duodecim

- Danish Health Authority
- Geneva Foundation for Medical Education and Research
- Belgian Health Care Knowledge Centre
- AETSA (Andalusian Agency for Health Technology Assessment)
- Haute Autorité de santé
- German Institute of Medical Documentation and Information

Data collection and analysis

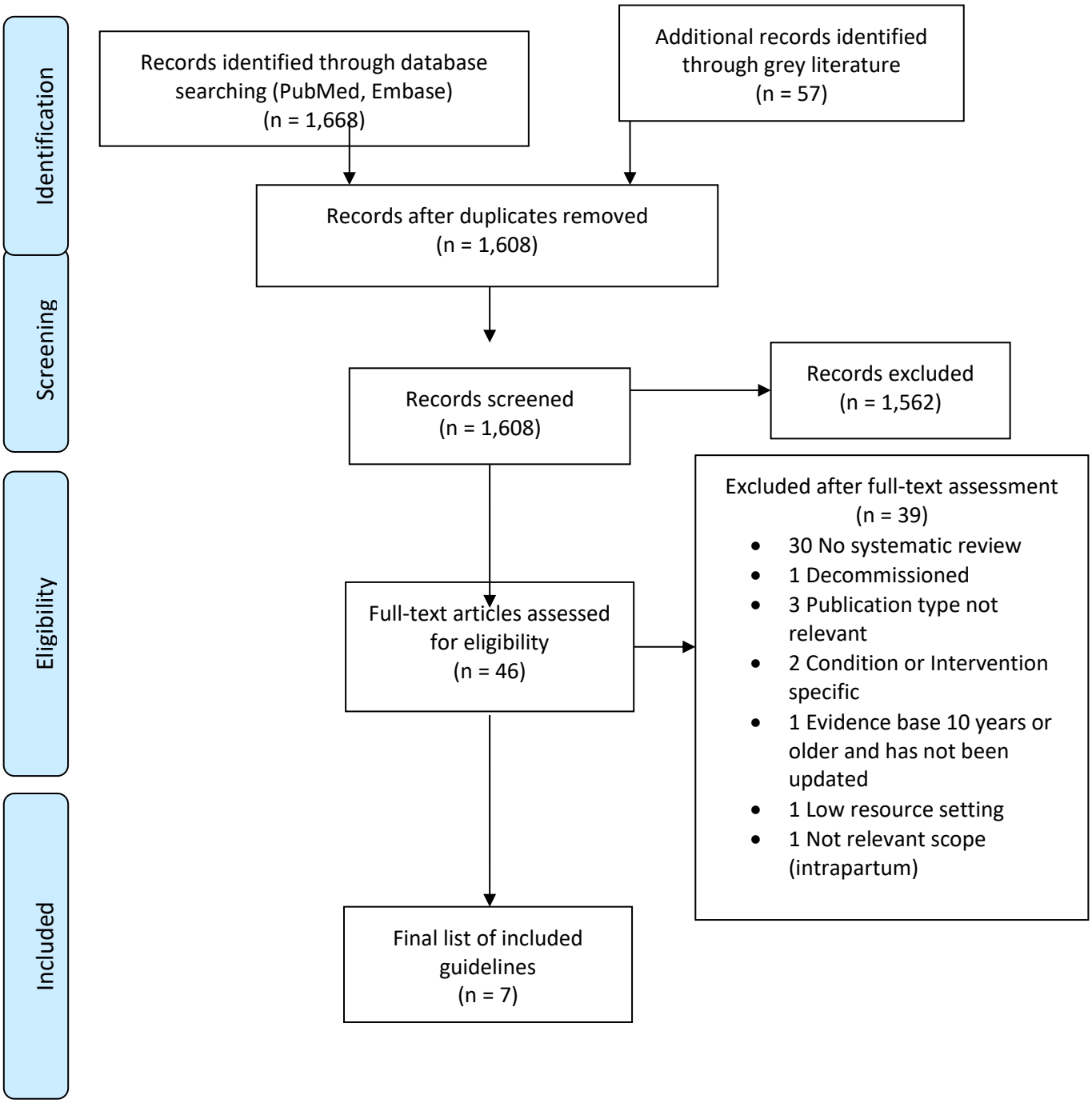
Citations were screened by one reviewer to eliminate clearly irrelevant studies. The remaining citations were reviewed per the inclusion criteria.

Table App A.2. Search strings

Database	Search string	Citations	Date of last search
PubMed	Search ("Pregnancy"[MeSH] OR "Hospitals, Maternity"[MeSH] OR "Maternal Health Services"[MeSH] OR "Gynecology"[MeSH] OR "Obstetrics"[MeSH] OR "prenatal care"[MeSH Terms] OR "antenatal care"[Text Word]) Filters: Guideline; published in the last 10 years; Humans; English Sort by: [pubsolr12]	857	09/08/2017
Embase	('prenatal care'/exp OR 'ante natal care':ti,ab OR 'antenatal care':ti,ab OR 'antenatal control':ti,ab OR 'prenatal care':ti,ab OR 'maternal care'/exp OR 'maternal care' OR 'pregnancy'/exp) AND 'practice guideline'/de AND (2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py OR 2012:py OR 2013:py OR 2014:py OR 2015:py OR 2016:py OR 2017:py) AND [female]/lim AND [embase]/lim NOT [medline]/lim	811	09/08/2017

Appendix B: PRISMA flow diagram

Figure App B.1. PRISMA flow diagram



Appendix C: Excluded studies

Table App C.0.1. Full-text articles excluded from systematic review

Clinical guideline title and reference	Reason for exclusion
Menard MK, Kilpatrick S, Saade G, et al. Levels of maternal care. American journal of obstetrics and gynecology.212(3):259-71.	Publication type not relevant
Takeda T, Wong TF, Adachi T, Ito K, Uehara S, Kanaoka Y, et al. Guidelines for office gynecology in Japan: Japan Society of Obstetrics and Gynecology and Japan Association of Obstetricians and Gynecologists 2011 edition. The journal of obstetrics and gynaecology research.38(4):615-31.	No reference made to systematic search for evidence
Minakami H, Maeda T, Fujii T, et al. Guidelines for obstetrical practice in Japan: Japan Society of Obstetrics and Gynecology (JSOG) and Japan Association of Obstetricians and Gynecologists (JAOG) 2014 edition. The journal of obstetrics and gynaecology research.40(6):1469-99.	No reference made to systematic search for evidence
ACOG. Committee Opinion No. 478: Family history as a risk assessment tool. Obstetrics and gynecology.117(3):747-50.	Condition specific
ACOG. Hospital-Based Triage of Obstetric Patients. 2016.	No reference made to systematic search for evidence
ACOG. Approaches to Limit Interventions During Pregnancy and Birth. 2017.	No reference made to systematic search for evidence
ACOG. Planned Birth At Home. 2017.	No reference made to systematic search for evidence
Akkerman D, Cleland L, Croft G, Eskuchen K, Heim C, Levine A, et al. Routine prenatal care. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI). 2012;7:2013-03.	Out of date

Australian College of Midwives. National Midwifery Guidelines for Consultation and Referral 3rd Ed Issue 2. 2014.	No reference made to systematic search for evidence
Dubai Health Authority. Antenatal care protocols. 2015.	No reference made to systematic search for evidence
All Wales Birth Centre. Midwife-led care guidelines. 2007.	No reference made to systematic search for evidence
Vanderbilt University Medical Centre. Guidelines for Triage of Obstetric Patients. 2010.	No reference made to systematic search for evidence
National Research Council. An Update on Research Issues in the Assessment of Birth Settings: Workshop Summary: National Academies Press (US); 2013.	Conference summary
Croydon Health Services NHS. Clinical risk assessment (antenatal). 2013.	No reference made to systematic search for evidence
Division Ministry of Health and Family Welfare Government of India. Antenatal care and skilled attendance at birth. 2010.	No reference made to systematic search for evidence
Division of Reproductive Health Ministry of Public Health and Sanitation. National Guidelines for Quality Obstetrics and Perinatal Care. 2012.	No reference made to systematic search for evidence
Eastern Health A. Expected Pathways of Care for Pregnant Women. 2014.	No reference made to systematic search for evidence
Eastern Health A. Guidelines for Consultation and Collaborative Maternity Care Planning. 2014.	No reference made to systematic search for evidence
Family Health Bureau MoH. Maternal Care Package: A Guide to Field Healthcare Workers. 2011.	Low resource setting only
Gloucestershire Hospitals NHS. Antenatal Clinic / Maternity Assessment / Maternity Assessment Centre / Triage Policy. 2017.	No reference made to systematic search for evidence

Gold Coast Health. Maternity Shared Care Guidelines. 2014.	No reference made to systematic search for evidence
ICGP. Antenatal Care. 2010.	Intervention specific
NHS Nottingham. Birth place decisions. 2014.	No reference made to systematic search for evidence
NHS Scotland. Pathways for Maternity Care. 2009.	No reference made to systematic search for evidence
Wales NHS. Maternity Triage Guideline (Acute and Community) 2016.	No reference made to systematic search for evidence
Norfolk and Norwich University Hospitals NHS. Antenatal Booking and subsequent Antenatal Appointments and Risk Assessment. 2015.	No reference made to systematic search for evidence and recommendations not linked to evidence
Nottingham NHS. Antenatal Risk Assessment. 2017.	No reference made to systematic search for evidence
Nottingham University Hospitals NHS. Guideline for Clinical Risk Assessment ANC. 2010.	No reference made to systematic search for evidence
Oxford University Hostpitals NHS. Antenatal Care. 2016.	No reference made to systematic search for evidence
Perinatal Services BC. Prenatal Care Pathway. 2014.	No reference made to systematic search for evidence
Plymouth Hospitals NHS. No.35 Risk assessment and identification of low- and high-risk antenatal care pathways. 2013.	No reference made to systematic search for evidence
RANZCOG. Routine antenatal assessment in the absence of pregnancy complications. 2016.	No reference made to systematic search for evidence

RANZCOG. Maternal suitability for models of care. 2015	No reference made to systematic search for evidence
RCM. Evidence Based Guidelines for midwifery led care in labour. 2012.	Not relevant stage of pregnancy - intrapartum
RCOG. Improving patient safety: risk management for maternity and gynaecology. 2009.	Not relevant publication type - clinical governance advice
SA Maternal and Neonatal Clinical Network. Normal Pregnancy, Labour and Puerperium Management. 2015.	No reference made to systematic search for evidence
Shrewsbury Telford NHS. Clinical Risk Assessment (Antenatal) V 11.0. 2015.	No reference made to systematic search for evidence
VA/DoD. Clinical practice guideline for pregnancy management. 2009.	Evidence base 10 years or older and has not been updated
Western Isles NHS. Patient care pathway. Unknown.	No reference made to systematic search

Key: ACOG — The American Congress of Obstetricians and Gynecologists; NHS — National Health Service; ICGP — Irish College of General Practitioners; BC — British Columbia; RANZCOG — Royal Australian and New Zealand College of Obstetricians and Gynaecologists; RCM — Royal College Of Midwives; RCOG — Royal College of Obstetricians and Gynaecologists; SA — South Africa; VA/DoD — Department of Veterans Affairs/ United States Department of Defense

Appendix D: Risk factors and clinical questions to identify women who may require additional care

Table App D.4. Risk factors and clinical questions to identify women who may require additional care, based on their maternal characteristics for each clinical guideline

Maternal Characteristics		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
Maternal age at booking	Criteria	Age <16 yrs or >40 yrs	Age < 18 yrs or > 40 yrs	Adolescent-teenager or > 40 yrs	Age ≥40 yrs	Not included	Age < 18 yrs or > 40 yrs
	Evidence base (search date)	Based on existing local practice	Systematic review (Oct 2012)	NICE 2003	NICE 2003		KCE 2003 NICE 2008 AHMAC 2014
Weight of woman	Criteria	BMI >30 kg/m^2 or BMI <18kg/m^2	BMI ≥ 30 kg/m^2 or BMI <18kg/m^2	Obesity or underweight	BMI ≥35 kg/m^2 and ≤18 kg/m^2	Not included	Not included
	Evidence base (search date)	Based on existing local practice	Systematic review (Oct 2012)	NICE 2008	NICE 2003		
	Clinical	Not included	What is the	Not included	What specific	Not included	Not included

	question		purpose of the routine examination of the BMI and weight watching in early pregnancy?		risk assessments are required for pregnant women above and below their most healthy weight?		
	Evidence base (search date)		Systematic review (Oct 2012)		Systematic review (March 2011)		
Social services input (SSI)	Criteria	Women who have required SSI & there is no related impact on the pregnancy or the woman's health	Vulnerable women at high risk of social exclusion	Psychosocial issues/ mental health problems: developmental delay or other disabilities or vulnerability or	Women who are particularly vulnerable or who lack social support	Not included	Lack of social support, domestic violence, psycho-social vulnerability

				lack of social support			
	Evidence base (search date)	Based on existing local practice	Systematic review (Oct 2012)	NICE 2008	NICE 2003		KCE 2003 NICE 2008 AHMAC 2014
	Criteria	Not included	Delivery of the newborn for adoption, asylum seeker or refugee, homeless, sexual abuse	Not included	Not included	Not included	Not included
	Evidence base (search date)		ACOG 2006 CSGC 2007 NICE 2008 ACOG 2010 ICSI 2010				
	Criteria	Not included	Women who	Not included	Not included	Not included	Not included

			suffer from domestic violence				
	Evidence base (search date)		NICE 2008 ACOG 2012				
Occupational hazards	Criteria	Not included	Not included	Not included	Occupational hazards	Not included	Not included
	Evidence base (search date)				NICE 2003		
Late antenatal care	Criteria	Not included	1st antenatal consultation after 20 weeks	Not included	Not included	Not included	1st antenatal consultation after 20 weeks
	Evidence base (search date)		ACOG 2006 CSGC 2007 NICE 2008 ACOG 2010				KCE 2003 NICE 2008 AHMAC 2014

			ICSI 2010				

Key: ACOG 2006 — ACOG Committee Opinion No. 343: psychosocial risk factors: perinatal screening and intervention; CSGC 2007 — Cancer Genetics Studies Consortium 2007; ACOG 2010 — ACOG Committee opinion no. 453: Screening for depression during and after pregnancy; ICSI 2010 — Institute for Clinical Systems Improvement — Routine prenatal care.

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed) undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

Table App D.5. Risk factors and clinical questions to identify women who may require additional care, based on their medical history for each clinical guideline

Medical History		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
Cardiovascular disease (CVD)	Criteria	CVD including hypertension	Not included	CVD (e.g. hypertension, rheumatic heart disease)	Cardiac disease, including hypertension	Not included	Cardiac disease
	Evidence base (search date)	Based on existing local practice		NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
	Clinical question	Not included	Not included	What pre-existing medical conditions affect blood pressure in the first trimester of pregnancy?	Not included	Not included	Not included
	Evidence base (search			Systematic review (March			

	date)			2011)			
Endocrine disdorder	Criteria	Endocrine disorder or insulin dependent diabetes or H/O gestational	Endocrine disorders	Endocrine disorder	Endocrine disorder	Not included	Endocrine disorder
	Evidence base (search date)	Based on existing local practice	NICE 2008, Spanish Group of Diabetes and Pregnancy 2006	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Diabetes	Criteria	Diabetes	Diabetes	Diabetes	Diabetes	Not included	Diabetes
	Evidence base (search date)	Based on existing local practice	NICE 2008 Spanish Group of Diabetes and Pregnancy, 2006	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Gestational	Clinical	Risk factors:	Not included	What risk	Not included	Not included	Not included

diabetes	question	previous history of gestational diabetes or glucose intolerance; family history of diabetes or ethnicity; maternal age (>35 y); BMI before pregnancy ≥25 or 30; maternal birth weight >4.1 or < 2.7 kg; previous macrosomia (> 4 or 4.5 kg), previous unexplained stillbirth,		factors are associated with increased risk of gestational diabetes?			

		unexplained preterm birth, pre-eclampsia, repeated miscarriage; previous neonatal hypoglycemia, hypocalcemia, or hyperbilirubinemia; repeated glycosuria in pregnancy; polyhydramnios; suspected macrosomia; polycystic ovary syndrome; corticoid treatment;					

		gestational HTA					
	Evidence base (search date)	Based on existing local practice		New Zealand Ministry of Health clinical guidelines for diabetes (Dec 2013)			
Thyroid	Criteria	Not included	Not included	Thyroid disorder	Not included	Not included	Not included
	Evidence base (search date)			NICE 2008			
Trichomoniasis	Clinical question	Not included	What are the risk factors for developing trichomoniasis?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (May 2012)				
Pre-	Clinical	Not included	Not included	What are the	Not included	Not included	Not included

eclampsia	question			risk factors for developing pre-eclampsia?			
	Evidence base (search date)			Systematic review (Sep 2012)			
Haematological	Criteria	Haematological disorder, Thromboembolic disorders	Thromboembolic disease	Haematological disorder	Haematological disorders, including sickle cell or thalassaemia, thromboembolic disease	Not included	Not included
	Evidence base (search date)	Based on existing local practice	UpToDate	NICE 2008	NICE 2003		
Dental	Clinical question	Not included	Not included	Does periodontal	Not included	Not included	Not included

				disease confer any risks to pregnancy or to the neonate?			
	Evidence base (search date)			Systematic review (Nov 2010)			
	Clinical question	Not included	Not included	Does dental caries confer any risks in pregnancy or to the neonate?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Nov 2010)			
Mental health	Criteria	Women on Tier 1 and Tier 2 of the Integrated	Psychiatric disease requiring	Psychiatric disorders	Existing psychiatric disorders (on	Not included	Not included

		Perinatal Mental Health Care Pathway, Psychiatric disorder – Severe/Moderate/Mild	medication		medication)		
	Evidence base (search date)	Based on existing local practice	ACOG 2010	NICE 2008	NICE 2003		
Renal disease	Criteria	Renal disease	Kidney disease	Kidney disease	Renal disease	Not included	Renal disease
	Evidence base (search date)	Based on existing local practice	NICE 2008	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Immunisation	Criteria	Not included	Not included	Immunisation	Not included	Not included	Immunization status (lack of vaccination against

							hepatitis B, rubella and/or lack of history of rubella, varicella, toxoplasmosis, CMV)
	Evidence base (search date)			NICE 2008			KCE 2003, NICE 2008, AHMAC 2014
Hepatic disease	Criteria	Liver disease	Liver disease with failure	Not included	Hepatic disease	Not included	Hepatic disease
	Evidence base (search date)	Based on existing local practice	NICE 2008		NICE 2003		KCE 2003, NICE 2008
Epilepsy	Criteria	Neurological disorder e.g. epilepsy	Epilepsy and other neurological	Epilepsy	Epilepsy requiring anticonvulsant	Not included	Not included

			diseases		drugs		
	Evidence base (search date)	Based on existing local practice	AJOG -Dunlop, 2008	NICE 2008	NICE 2003		
Malignant disease	Criteria	Malignant disease	Neoplastic disease	Malignancy	Malignancy disease	Not included	Not included
	Evidence base (search date)	Based on existing local practice	ACOG 2006, CSGC 2007, NICE 2008, ACOG 2010, ICSI 2010	NICE 2008	NICE 2003		
Asthma	Criteria	Severe asthma or other respiratory disease	Chronic respiratory disease: severe asthma	Severe asthma	Severe asthma	Not included	Not included
	Evidence base (search	Based on existing local	OCPG- not specified	NICE 2008	NICE 2003		

	date)	practice					
Autoimmune disorders	Criteria	Autoimmune diseases	Autoimmune diseases with systemic involvement: antiphospholipid antibody syndrome	Autoimmune disorders	Autoimmune disorders such as antiphospholipid syndrome	Not included	Autoimmune disorders
	Evidence base (search date)	Based on existing local practice	ACOG 2006, CSGC 2007, NICE 2008, ACOG 2010, ICSI 2010	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Infertility treatment this pregnancy	Criteria	Infertility treatment this pregnancy	Not included	Not included	Not included	Not included	Not included
	Evidence base (search	Based on existing local					

	date)	practice					
Infections	Criteria	Infections e.g. Group B Streptococcus	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
HIV	Criteria	Not included	HIV	HIV	HIV	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Nov 2010)	NICE 2003		
Hepatitis B	Clinical question	Not included	Hepatitis B virus infection	Hepatitis B	Hepatitis B virus (HBV) infected	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	NICE 2008	NICE 2003		

Hepatitis C	Criteria	Not included	Not included	Hepatitis C infection	Not included	Not included	Not included
	Evidence base (search date)			NICE 2008			
Cystic Fibrosis	Criteria	Not included	Cystic Fibrosis	Not included	Cystic Fibrosis	Not included	Not included
	Evidence base (search date)		ACOG 2006, CSGC 2007, NICE 2008, ACOG 2010, ICSI 2010		NICE 2003		
Skeletal problems	Criteria	Skeletal problems e.g. scoliosis, rheumatoid arthritis	Not included	Not included	Not included	Not included	Not included
	Evidence	Based on					

	base (search date)	existing local practice					
Gastro intestinal disorders	Criteria	Gastro intestinal disorders	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Latex allergy	Criteria	Latex allergy	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Major abdominal surgery	Criteria	Major abdominal surgery, Uterine surgery	Myomectomy or cone biopsy	Uterine surgery (e.g. myomectomy or cone biopsy)	Uterine surgery including myomectomy or cone biopsy	Not included	Uterine surgery including myomectomy or cone biopsy
	Evidence	Based on	OCPG-not	NICE 2008	NICE 2003		KCE 2003,

	base (search date)	existing local practice	sepcified				NICE 2008, AHMAC 2014
Uterine pathology	Criteria	Not included	Not included	Not included	Not included	Not included	Uterine pathology (congenital anomaly, abnormal cervix cytology)
	Evidence base (search date)						KCE 2003, NICE 2008, AHMAC 2014
Cervical treatment	Criteria	Women who have had previous cervical treatment, now term, >2 LLETZ procedures	Not included	Not included	Not included	Not included	Not included

	Evidence base (search date)	Based on existing local practice					
Genital mutilation	Criteria	Female Genital Mutilation	Female Genital Mutilation	Genital mutilation	Not included	Not included	Genital mutilation
	Evidence base (search date)	Based on existing local practice	ACOG 2006, CSGC 2007, NICE 2008, ACOG 2010, ICSI 2010	NICE 2008			KCE 2003, NICE 2008, AHMAC 2014
Disability	Criteria	Not included	Physical or mental disability	Not included	Not included	Not included	Not included
	Evidence base (search date)		Not stated				
General	Criteria	Medical	On medication	Not included	Not included	Not included	Use of

medical		condition that is not impacting on the pregnancy or the woman's health					medicines
	Evidence base (search date)	Based on existing local practice	NICE 2008				KCE 2003, NICE 2008, AHMAC 2014
	Criteria	Not included	Other serious medical and surgical conditions	Not included	Not included	Not included	Not included
	Evidence base (search date)		Unknown				

Key: ACOG 2006 — ACOG Committee Opinion No. 343: psychosocial risk factors: perinatal screening and intervention; CSGC 2007 — Cancer Genetics Studies Consortium 2007; ACOG 2010 — ACOG Committee opinion no. 453: Screening for depression during and after pregnancy; ICSI 2010 — Institute for Clinical Systems Improvement — Routine prenatal care; AJOG — Dunlop, 2008 — American Journal of Obstetrics and Gynaecology Preconception Series; UpToDate — Evidence-based clinical decision support resource.

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed), undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

Table App D.6: Risk factors and clinical questions to identify women who may require additional care, based on their previous obstetric history for each clinical guideline

Previous obstetric history		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
Previous congenital abnormality	Criteria	Previous congenital abnormality, with no evidence of reoccurrence	Newborn with congenital (structural or chromosomal) malformation	Baby with a congenital abnormality (structural or chromosomal)	A baby with a congenital anomaly (structural or chromosomal)	Not included	Severe perinatal morbidity (congenital or acquired)
	Evidence base (search date)	Based on existing local practice	Unknown	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Severe perinatal morbidity	Criteria	Not included	Newborn with severe malformations, aneuploidy or sick	Not included	Not included	Not included	Severe perinatal morbidity (congenital or acquired)
	Evidence base (search date)		AJOG Stubblefield 2008; RCOG 2011				KCE 2003, NICE 2008, AHMAC 2014
Stillbirth or neonatal death	Criteria	Stillbirth	Neonatal death	Stillbirth or neonatal death	A stillbirth or neonatal death	Not included	Not included
	Evidence base (search date)	Based on existing local practice	Unknown	NICE 2008	NICE 2003		
Abortion	Criteria	Not included	Repeated abortions	Not included	Not included	Not included	Not included
	Evidence base (search date)		RCOG 2011				
Recurrent miscarriage	Criteria	Recurrent miscarriage >2	Recurrent miscarriage	Recurrent miscarriage (>3 consecutive pregnancy losses) or a mid-trimester loss	Not included	Not included	>3 documented miscarriages
	Evidence base (search date)	Based on existing local practice	AJOG Stubblefield, 2008	NICE 2008			KCE 2003, NICE 2008, AHMAC 2014

Pre-term birth	Criteria	preterm birth/cervical suture	Prematurity	Pre-term birth	Not included	Not included	Preterm birth
	Evidence base (search date)	Based on existing local practice	AJOG¬Stubblefield, 2008; RCOG, 2011	NICE 2008			KCE 2003, NICE 2008, AHMAC 2014
Induction	Criteria	Prostaglandin induction resulting in the onset of labour	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Severe pre-eclampsia, HELLP syndrome or eclampsia	Criteria	Severe pre eclampsia, HELLP or eclampsia	Severe preeclampsia, HELLP syndrome or eclampsia	Pre-eclampsia or eclampsia	Severe pre-eclampsia, HELLP syndrome or eclampsia	Not included	Pregnancy induced hypertension and preeclampsia (HELLP syndrome)
	Evidence base (search date)	Based on existing local practice	Systematic review (Oct 2012) and NICE 2008	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Rhesus isoimmunisation	Criteria	Rhesus isoimmunisation	Rh isoimmunisation or other blood antibody	Rhesus isoimmunisation or other significant blood group antibodies	Rhesus isoimmunisation or other significant blood group antibodies	Not included	Rhesus isoimmunisation or other significant blood group antibodies
	Evidence base (search date)	Based on existing local practice	SEMFyC, 2002; USPSTF, 2004; BSH, 2008; NICE, 2008; AHRQ, 2010; ICSI, 2010	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Caesarean section	Criteria	Previous caesarean section	Caesarean section	Caesarean section	Caesarean section	Not included	Caesarean section
	Evidence base (search date)	Based on existing local practice	Unknown	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
	Criteria	Not included	Surgical and postsurgical complications due to caesarean section	Not included	Not included	Not included	Not included

	Evidence base (search date)		Unknown				
Previous shoulder dystocia	Criteria	Previous shoulder dystocia	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Previous difficult instrumental delivery	Criteria	Previous difficult instrumental delivery	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Previous uterine rupture	Criteria	Previous uterine rupture	Women with a history of 2 or more episodes of uterine bleeding before or after childbirth	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice	AJOG Stubblefield 2008; RCOG 2011				
Previous Postpartum haemorrhage	Criteria	Previous PPH, not requiring blood transfusion or surgical intervention	Postpartum haemorrhage and childbirth pathology	Antenatal or postpartum haemorrhage	Antenatal or postpartum haemorrhage on two occasions	Not included	Antenatal or postnatal Haemorrhage
	Evidence base (search date)	Based on existing local practice	OCPG- not specifed	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Previous baby with Group B Streptococcus	Criteria	Previous baby with Group B Streptococcus	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Previous placental abruption	Criteria	Previous placental abruption	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Puerperal psychosis	Criteria	Not included	Postpartum psychosis	Puerperal psychosis	Puerperal psychosis	Not included	Puerperal psychosis

	Evidence base (search date)		NICE 2008	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Number of previous births	Criteria	Grand multiparity>4	Not included	Four or more previous births	Grand multiparity (parity four or more)	Not included	Grand multiparity (parity four or more)
	Evidence base (search date)	Based on existing local practice		NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Small or large-for-gestational-age baby	Criteria	Baby weighing <2500g or >4500g < 5th centile > 95th centile	< 5th centile or > 95th centile	Small or large-for-gestational-age baby	Small-for-gestational-age (SGA) infant (less than 5th centile) - a large-for-gestational-age (LGA) infant (greater than 95th centile) - a baby weighing <2500g or > 4500g	Not included	Baby weighing <2500 or >4500, <5th centile or >95th centile
	Evidence base (search date)	Based on existing local practice	Unknown	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
Retained placenta	Criteria	Retained placenta on 2 occasions	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Perineal trauma	Criteria	Significant perineal trauma i.e 3rd or 4th degree tears	Severe perineal trauma	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice	Unknown				

Key: AJOG Stubblefield 2008 — American Journal of Obstetrics and Gynaecology Stubblefield 2008[28]; RCOG 2011 – Royal College of Obstetricians and Gynaecologists[29]

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed), undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

Table App D.7. Risk factors and clinical questions to identify women who may require additional care, based on their family history for each clinical guideline

Family history		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
General family history	Criteria	Family history of genetic disorders	Family history of genetic diseases	family history of genetic disorder	Family history of genetic disorder	Not included	Familial diseases or genetic disorders
	Evidence base (search date)	Based on existing local practice	Unknown	NICE 2008	NICE 2003		KCE 2003 NICE 2008
Sickle cell	Clinical question	Not included	Not included	Not included	What is the diagnostic value and effectiveness of the following screening methods in identifying clinically important genotypes of sickle cell disease and sickle cell carrier status (trait) including: history taking; family origin; full blood count: Hb electrophoresis; ferritin; mean cell volume; high performance liquid chromatography; sickle solubility testing (Sickledex)?	Not included	Not included
	Evidence base (search date)				Systematic review (Dec 2012)		

Key: AJOG Stubblefield, 2008 — American Journal of Obstetrics and Gynaecology — The clinical content of preconception care: reproductive history[28]; RCOG, 2011 — Royal College of Obstetricians and Gynaecologists — The investigation and treatment of couples with recurrent first-trimester and second-trimester miscarriage.[29]

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed), undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

Table App D.8. Risk factors and clinical questions to identify women who may require additional care, based on their modifiable risk factors for each clinical guideline

Modifiable risk factors e.g. Smoking, alcohol, illicit drugs		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
Substance abuse	Criteria	Use of recreational drugs	Addiction to toxic substances	Use of recreational drugs such as heroin, cocaine (including crack cocaine), ecstasy and cannabis	Drug use such as herion, cocaine (including crack cocaine) and ecstasy	Not included	Drug use
	Evidence base (search date)	Based on existing local practice	Unknown	NICE 2008	NICE 2003		KCE 2003, NICE 2008, AHMAC 2014
	Clinical question	Not included	Not included	Not included	Not included	Does screening women for substance abuse at ANC visits compared with not screening improve health outcomes?	Not included
	Evidence base (search date)					WHO 2014	
Alcohol	Criteria	Alcohol dependency	Addiction to toxic substances	History of alcohol misuse	Not included	Not included	Alcohol consumption
	Evidence base (search date)	Based on existing local practice	AJOG-Floyd 2008	NICE 2008			KCE 2003, NICE 2008, AHMAC 2014
	Clinical question	Not included	What are the consequences of drinking alcohol during pregnancy?	Not included	What is the minimum level of alcohol intake associated with fetal alcohol syndrome and other baby	Does screening women for alcohol abuse at ANC visits compared with not screening improve health outcomes?	Not included

					outcomes?		
	Evidence base (search date)		Systematic review (Oct 2012)		Systematic review (Dec 2012)	WHO 2014	
Smoking	Criteria	Smoker	Heavy smoker	Not included	Not included	Not included	Active and/or passive smoking
	Evidence base (search date)	Based on existing local practice	AJOG-Floyd, 2008				KCE 2003, NICE 2008, AHMAC 2014
	Clinical question	Not included	What are the consequences of active and passive smoking during pregnancy?	What are the maternal and perinatal outcomes associated with smoking in pregnancy?	Not included	Does screening women for tobacco use at ANC visits compared with not screening improve health outcomes?	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Nov 2010)		WHO 2013	
Sexual activity	Criteria	Not included	Not included	Not included	Not included	Not included	Sexual behaviours that may impact the pregnancy
	Evidence base (search date)						KCE 2003, NICE 2008, AHMAC 2014

Key: AJOG-Floyd, 2008 — American Journal of Obstetrics and Gynaecology — The clinical content of preconception care: reproductive history[28]; WHO 2013 Systematic screening for active tuberculosis: principles and recommendations.[30]

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed), undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

Table App D.9. Risk factors and clinical questions to identify women who may require additional care, based on clinical exams during pregnancy relating to the health of the foetus for each clinical guideline

Clinical exams during pregnancy relating to the health of the foetus		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
Chromosomal anomalies	Criteria	Fetal abnormality	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
	Clinical question	Not included	Not included	Which tests should be used to screen for chromosomal abnormalities?	What is the diagnostic value and effectiveness of the following screening methods in identifying babies with chromosomal anomalies: bood tests; nuchal translucency; maternal age; ultrasound – soft markers (choroid plexus cyst, thickened nuchal fold, echogenic echocardiac focus, echogenic bowel, renal pylectasis, humeral and femoral shortening); ultrasound – nasal bone. Different timings include: first trimester; second trimester;	Not included	Not included

					integrated. First-trimester screening for chromosomal anomalies		
	Evidence base (search date)			Systematic review (Jan 2011)	Systematic review (Dec 2012)		
Downs syndrome	Clinical question	Not included	Not included	Not included	What is the diagnostic value and effectiveness of the following screening methods in identifying babies with Down's Syndrome: bood tests; nuchal translucency; maternal age; ultrasound – soft markers (choroid plexus cyst, thickened nuchal fold, echogenic echocardiac focus, echogenic bowel, renal pylectasis, humeral and femoral shortening); ultrasound – nasal bone. Different timings include: first trimester; second trimester;	Not included	Not included

					integrated. First-trimester screening for Down's syndrome and other chromosomal anomalies		
	Evidence base (search date)				Systematic review (Dec 2012)		
Structural anomalies	Criteria	Fetal abnormality	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
	Clinical question	Not included	Not included	Not included	What is the diagnostic value and effectiveness of the following screening methods in identifying serious structural anomalies?	Not included	Not included
	Evidence base (search date)				Systematic review (Dec 2012)		
Foetal growth and wellbeing	Criteria	Fetal macrosomia	Intrauterine growth restriction	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice	Consensus				
	Criteria	Reduced fetal movements (after 2 admissions)	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
	Criteria	IUGR	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
	Clinical	Not included	What is the benefit of the Doppler study of uterine	Not included	Not included	Not included	Not included

	question		artery and umbilical artery in low risk pregnancies?				
	Evidence base (search date)		Systematic review (Oct 2012)				
	Clinical question	Not included	Are routine cardiotocography checks needed for the prenatal assessment of foetal wellbeing? If so, in what week of pregnancy?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Oligohydramnios	Criteria	Oligohydramnios	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Polyhydramnios	Criteria	Polyhydramnios	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Low lying placenta	Criteria	Low lying placenta	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed), undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

Table App D.10. Risk factors and clinical questions to identify women who may require additional care, based on clinical exams during pregnancy relating for each clinical guideline

Clinical exams during pregnancy relating to other risk factors		GAIN 2016	AETSA 2014	AHMAC 2012 & 2014	NICE 2008	WHO 2016	KCE 2015
Anaemia	Criteria	Anaemia <9g/dl	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
	Clinical question	Not included	What is the purpose of universal screening for anaemia and at what stage of pregnancy should it be done?	What are the maternal and/or fetal benefits and risks of screening for anaemia?	Not included	What is the diagnostic value of on-site tests for assessing blood haemoglobin concentration compared with the reference standard (full blood count) to detect maternal anaemia?	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Dec 2012)		Systematic review (IFGO 2017)	
	Clinical question	Not included	What is the purpose of determining the level of ferritin in a biochemical test?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Screening for cervical cancer	Clinical	Not included	What is the purpose of universal screening	What are the benefits and risks of performing a	Not included	Not included	Not included

	question		for cervical cancer and on what stage of pregnancy should it be done?	cervical smear during pregnancy?			
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Oct 2012)			
Routine breast and gynaecological exploration	Clinical question	Not included	What is the purpose of the routine examination of breast and gynaecological exploration in early pregnancy?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Gonorrhoea	Clinical question	Not included	Not included	What are the maternal and/or fetal benefits of screening for gonorrhoea?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Oct 2012)			
	Clinical question	Not included	Not included	What are the harms of not screening for gonorrhoea?	Not included	Not included	Not included

	Evidence base (search date)			Systematic review (Oct 2012)			
HIV	Clinical question	Not included	What is the purpose of universal screening for human immunodeficiency virus in pregnant women and at what stage of pregnancy should it be done?	What are the harms of not screening for HIV in pregnancy?	Not included	Does screening women for HIV infection in ANC settings compared with not screening for HIV improve health outcomes?	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Nov 2010)		WHO, 2015	
	Clinical question	Not included	Not included	What benefits would result from screening for HIV in pregnancy?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Dec 2010)			
Rubella	Clinical question	Not included	What is the purpose of universal screening for rubella in pregnant women and at what stage of pregnancy should it be done?	Does screening pregnant women for rubella immunity lead to improved maternal and perinatal outcomes?	Not included	Not included	Not included

	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Nov 2010)			
TB infection	Clinical question	Not included	Not included	Not included	Not included	Does screening women for TB infection in ANC settings compared with not screening for TB improve health outcomes?	Not included
	Evidence base (search date)					WHO 2013	
Hepatitis B virus	Clinical question	Not included	What is the purpose of universal screening for hepatitis Bvirus in pregnant women and at what stage of pregnancy should it be done?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Hepatitis C	Clinical question	Not included	What is the purpose of universal screening for hepatitis C in pregnant women and at what stage of pregnancy should it be done?	What is the diagnostic value and clinical effectiveness of screening for hepatitis C?	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Nov 2010)			

Group B streptococcus	Clinical question	Not included	What is the purpose of universal screening for group B streptococcus in pregnant women and at what stage of pregnancy should it be done?	What are the benefits and risk of screening for GBS?	Not included	Not included	What are the benefits and harms of group B streptococcus screening in all healthy pregnant women, compared with a. GBS prophylaxis without a particular protocol (no screening or non-specified ad hoc intrapartum antibiotic use)? b. risk factor based prophylaxis?
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Feb 2013)			Systematic review (Jul 2014)
Toxoplasma	Clinical question	Not included	What is the purpose of universal screening for toxoplasma infection in pregnant women and at what stage of pregnancy should it be done?	What are the harms of not screening for toxoplasmosis?	Not included	Not included	What are the benefits and harms of toxoplasmosis screening in all healthy pregnant women, compared with no routine screening?
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Jan 2013)			Systematic review (May 2014)
	Clinical question	Not included	Not included	When should pregnant women be screened for toxoplasmosis?	Not included	Not included	Not included
	Evidence base			Systematic review			

	(search date)			(Jan 2013)			
	Clinical question	Not included	Not included	What are the maternal and/or fetal benefits of screening for toxoplasmosis?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Jan 2013)			
UTI	Criteria	Not included	Recurrent urinary tract infection	Not included	Not included	Not included	Not included
	Evidence base (search date)		Berens 2011				
Trichomoniasis	Clinical question	Not included	Not included	What are the benefits and risks of screening for trichomoniasis?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Apr 2013)			
Syphilis	Clinical question	Not included	What is the purpose of universal screening for syphilis in pregnant women and at what stage of pregnancy should it be done?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Varicella	Clinical question		What is the purpose of universal screening for varicella in pregnant women and at what stage of pregnancy should it be done?				

	Evidence base (search date)		Systematic review (Oct 2012)				
Chlamydia	Clinical question	Not included	What is the purpose of universal screening for chlamydia in pregnant women and at what stage of pregnancy should it be done?	Not included	What is the diagnostic value and effectiveness of the following screening methods in identifying genital Chlamydia: age; uring testing testing; endocervical swab; serum antibody testing; history?	Not included	What are the benefits and harms of chlamydia screening in all healthy pregnant women, compared with no screening or targeted tests in women with risk factors?
	Evidence base (search date)		Systematic review (Oct 2012)		Systematic review (Dec 2012)		Systematic review (July 2014)
Cytomegalovirus	Clinical question	Not included	What is the purpose of universal screening for cytomegalovirus in pregnant women and at what stage of pregnancy should it be done?	What are the benefits and risks of screening for cytomegalovirus?	Not included	Not included	What are the benefits and harms of CMV screening in all healthy pregnant women, compared with no routine screening?
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Apr 2013)			Systematic review (May 2014)
	Clinical question	Not included	Not included	When should pregnant women be screened for cytomegalovirus?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Apr 2013)			
Chagas disease	Clinical question	Not included	What is the purpose of universal screening	Not included	Not included	Not included	Not included

			for Chagas disease in pregnant women and at what stage of pregnancy should it be done?				
	Evidence base (search date)		Systematic review (Oct 2012)				
Primary genital herpes	Criteria	Primary genital herpes	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Sepsis	Criteria	Sepsis	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Maternal infection	Criteria	Maternal infection	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Thyroid dysfunction	Clinical question	Not included	What is the purpose of universal screening for thyroid disease and at what stage of pregnancy should it be done?	What are the benefits and harms of routine screening for thyroid dysfunction?	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Jan 2013)			
hypothyroidism	Criteria	Risk factors: history of previous thyroid dysfunction, goitre, positive thyroid antibodies, cervical irradiation, or thyroid surgery; age>30; family history of thyroid disease; diabetes type 1 or any other	Not included	Not included	Not included	Not included	Not included

		autoimmune disease; history of repeated abortions, prematurity, or infertility; morbid obesity; treatment with lithium, amiodarone, or recent administration of iodinated contrast; living in an area with moderate to severe deficiency of iodine.					
	Evidence base (search date)	Based on existing local practice					
	Clinical question						What are the benefits and harms of routine screening for hypothyroidism in asymptomatic pregnant women compared with no routine screening (or targeted screening of clinically at risk women)?
	Evidence base (search date)						Systematic review (April 2014)
Gestational diabetes	Criteria	Abnormal glucose tolerance	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					

	Clinical question	Not included	What is the most suitable screening method for gestational diabetes testing? At what stage of pregnancy should gestational diabetes screening be done? What are the appropriate criteria to consider a pregnant woman gestational diabetic?	Not included	What is the diagnostic value and effectiveness of screening tests to identify women at risk of diabetes in pregnancy?	What diagnostic criteria should be used to distinguish between GDM and diabetes in pregnancy to improve maternal and perinatal outcomes?	"Which screening strategies are more accurate and effective to screen healthy pregnant women for gestational diabetes? a. At which threshold? b. At which gestational age (<24 weeks, 24-30 weeks, 30 weeks or more)? c. In all women (universal) or in women at risk?"
	Evidence base (search date)		Systematic review (Oct 2012)		Systematic review (Dec 2012)	WHO 2013	Systematic review (Sep 2014)
Type 2 diabetes	Clinical question	Not included	Not included	What thresholds should be used to diagnose type 2 diabetes in pregnant women less than 20 weeks gestation?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review NZ, 2013 (Dec 2013)			
Blood pressure	Criteria	Hypertension, diastolic>90, systolic >140	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
	Clinical	Not included	What is the purpose of	Not included	Not included	Not included	Not included

	question		universal screening for hypertensive disorders [measurement of blood pressure (BP) and test strips] and in on what stage of pregnancy should it be done?				
	Evidence base (search date)		Systematic review (Oct 2012)				
Haemoglobinopathies	Clinical question	Not included	Not included	What are the benefits and risks of screening for haemoglobinopathies in pregnancy?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Nov 2012)			
Thalassaemia	Clinical question				What is the diagnostic value and effectiveness of the following screening methods in identifying clinically significant thalassaemia and thalassaemia carrier status (trait): history; family origin, full blood count; Hb electrophoresis; ferritin; mean cell volume?		
	Evidence base (search date)				Systematic review (Dec 2012)		
Proteinuria (+)	Criteria	Proteinuria (+) on	Not included	Not included	Not included	Not included	Not included

on more than 1 occasion		more than 1 occasion					
	Evidence base (search date)	Based on existing local practice					
Plasma urea level	Clinical question	Not included	What is the purpose of determining the plasma urea level in a biochemical test?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Plasma creatinine level	Clinical question	Not included	What is the purpose of determining the plasma creatinine level in a biochemical test?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Plasma uric acid	Clinical question	Not included	What is the purpose of determining the plasma uric acid level in a biochemical test?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				

Symptomatic bacteraemia	Clinical question	Not included	What is the purpose of universal screening for symptomatic bacteraemia in pregnant women and at what stage of pregnancy should it be done?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
Rhesus incompatibility	Clinical question	Not included	What is the purpose of universal screening for Rh incompatibility and at what stage of pregnancy should it be done?	Not included	Not included	Not included	Not included
	Evidence base (search date)		Systematic review (Oct 2012)				
	Criteria	Development of rhesus antibodies	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Antepartum haemorrhage requiring admission	Criteria	Antepartum haemorrhage requiring admission	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Malpresentation after 36 weeks	Criteria	Malpresentation after 36 weeks	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Multiple	Criteria	Multiple pregnancy	Not included	Not included	Not included	Not included	Not included

pregnancy	Evidence base (search date)	Based on existing local practice					
Epigastric pain	Criteria	Epigastric pain	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Bacterial Vaginosis	Clinical question	Not included	What is the purpose of universal screening for bacterial vaginosis in asymptomatic pregnant women and at what stage of pregnancy should it be done?	What are the harms of not screening for asymptomatic bacteriuria?	Not included	For pregnant women, what is the diagnostic value of Gram stain and dipstick on-site urine tests compared with the reference standard (urine culture) to detect asymptomatic bacteriuria?	Not included
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Dec 2010)		OCPG 2013- not specified	
Assisted conception	Criteria	Assisted conception with Clomifene or similar	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Genital bleeding	Criteria	Not included	Genital bleeding	Not included	Not included	Not included	Not included
	Evidence base (search date)		Consensus (Bailey, 2008)				
Threatened preterm labour	Criteria	Threatened premature labour	Preterm childbirth	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice	Consesnsus				
Risk factors for pre-term delivery	Clinical question	Not included	What is the purpose of universal screening for risk of preterm delivery and at	What are the risk factors for developing pre-term labour?	Not included	Not included	Not included

			what stage of pregnancy should it be done?				
	Evidence base (search date)		Systematic review (Oct 2012)	Systematic review (Jan 2013)			
Threatened miscarriage	Criteria	Threatened miscarriage, now resolved	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Pre-eclampsia	Clinical question	Not included	Not included	What are the harms of not screening for pre-eclampsia?	What is the diagnostic value of different screening methods in identifying women at risk of developing pre-eclampsia?	Not included	Not included
	Evidence base (search date)			Systematic review (Jan 2013)	Systematic review (Dec 2012)		
Low lying placenta	Criteria	Suspected low lying placenta, now resolved	Placenta previa after week 32	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice	Consesnsus				
Placental abruption	Criteria	Placental abruption	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Serum antibodies	Criteria	Serum antibodies of no clinical significance	Not included	Not included	Not included	Not included	Not included
	Evidence base (search date)	Based on existing local practice					
Bacterial Vaginosis	Clinical question	Not included	Not included	What benefits would result from screening for asymptomatic	Not included	Not included	Not included

				bacterial vaginosis?			
	Evidence base (search date)			Systematic review (Dec 2010)			
	Clinical question	Not included	Not included	What are the harms of not screening for asymptomatic bacterial vaginosis?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Dec 2010)			
Asymptomatic bacteriuria	Clinical question	Not included	Not included	What benefits would result from screening for asymptomatic bacteriuria?	Not included	Not included	Not included
	Evidence base (search date)			Systematic review (Dec 2010)			
Vitamin D deficiency	Criteria	Possible risk factors of vitamin D deficiency: women of South Asian, African, Caribbean or Middle Eastern family origin; women who have limited exposure to sunlight, such as women who are predominantly housebound, or usually remain covered when outdoors; women who eat a diet particularly low in vitamin D, such as	Not included	Not included	Not included	Not included	Not included

		women who consume no oily fish, eggs, meat, vitamin D-fortified margarine or breakfast cereal; women with a pre-pregnancy BMI>30 kg/m2					
	Evidence base (search date)	Based on existing local practice					
	Clinical question	Not included	Not included	Not included	Not included	Not included	What are the benefits and harms of routine vitamin D deficiency screening of all healthy pregnant women compared with no routine screening (or targeted screening of clinically at risk women)?
	Evidence base (search date)						Systematic review (April 2014)

Key: IFGO, 2017 — International Federation of Gynecology and Obstetrics — Accuracy of on-site tests to detect anemia during prenatal care[31]; WHO 2015 Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV[32]; WHO 2013 Systematic screening for active tuberculosis: principles and recommendations[30]; AJOG Stubblefield, 2008 — American Journal of Obstetrics and Gynaecology — The clinical content of preconception care: reproductive history[28]; OCPG — Other clinical practice guideline; RCOG, 2011 — Royal College of Obstetricians and Gynaecologists — The investigation and treatment of couples with recurrent first-trimester and second-trimester miscarriage.[29]

Notes:

- Criteria refers to the criteria used within the guidelines to identify women who may need additional care.
- Evidence base refers to the evidence used to underpin the criteria; this includes using previous high quality guidelines (which are listed), undertaking a systematic review (the date of the systematic review is provide in brackets) or using existing practice.

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