The 2016 WHO ANC model for a positive pregnancy experience: recommendations mapped to eight scheduled ANC contacts

Overarching aim: To provide pregnant women with respectful, individualized, person-centred care at every contact, with implementation of effective clinical practices (interventions and tests), and provision of relevant and timely information, and psychosocial and emotional support, by practitioners with good clinical and interpersonal skills within a well functioning health system.

Notes:

- These recommendations apply to pregnant women and adolescent girls within the context of routine ANC.
- This table does not include good clinical practices, such as measuring blood pressure, proteinuria and weight, and checking for fetal heart sounds, which would be included as part of an implementation manual aimed at practitioners.
- Remarks detailed in the shaded box with each recommendation should be taken into account when planning the implementation of these recommendations.

Type of intervention	Recommendation	Type of recommendation	Eight scheduled ANC contacts (weeks of gestation)							
			1 (12 weeks)	**2** (20 weeks)	**3** (26 weeks)	**4** (30 weeks)	**5** (34 weeks)	**6** (36 weeks)	**7** (38 weeks)	**8** (40 weeks)
A. Nutritional interventions										
Dietery interventions	**A.1.1:** Counselling about healthy eating and keeping physically active during pregnancy is recommended for pregnant women to stay healthy and to prevent excessive weight gain during pregnancy.[a]	Recommended	X	X	X	X	X	X	X	X
	A.1.2: In undernourished populations, nutrition education on increasing daily energy and protein intake is recommended for pregnant women to reduce the risk of low-birth-weight neonates.	Context-specific recommendation	X	X	X	X	X	X	X	X
	A.1.3: In undernourished populations, balanced energy and protein dietary supplementation is recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates.	Context-specific recommendation	X	X	X	X	X	X	X	X
	A.1.4: In undernourished populations, high-protein supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended								
Iron and folic acid supplements	**A.2.1:** Daily oral iron and folic acid supplementation with 30 mg to 60 mg of elemental iron[b] and 400 µg (0.4 mg) of folic acid[c] is recommended for pregnant women to prevent maternal anaemia, puerperal sepsis, low birth weight, and preterm birth.[d]	Recommended	X	X	X	X	X	X	X	X

continued

a. A healthy diet contains adequate energy, protein, vitamins and minerals, obtained through the consumption of a variety of foods, including green and orange vegetables, meat, fish, beans, nuts, whole grains and fruit.
b. The equivalent of 60 mg of elemental iron is 300 mg of ferrous sulfate hepahydrate, 180 mg of ferrous fumarate or 500 mg of ferrous gluconate.
c. Folic acid should be commenced as early as possible (ideally before conception) to prevent neural tube defects.
d. This recommendation supersedes the previous recommendation found in the 2012 WHO publication *Guideline: daily iron and folic acid supplementation in pregnant women* (36).

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Type of intervention	Recommendation	Type of recommendation	Eight scheduled ANC contacts (weeks of gestation)							
			1 (12 weeks)	**2** (20 weeks)	**3** (26 weeks)	**4** (30 weeks)	**5** (34 weeks)	**6** (36 weeks)	**7** (38 weeks)	**8** (40 weeks)
Iron and folic acid supplements	**A.2.2:** Intermittent oral iron and folic acid supplementation with 120 mg of elemental iron[e] and 2800 µg (2.8 mg) of folic acid once weekly is recommended for pregnant women to improve maternal and neonatal outcomes if daily iron is not acceptable due to side-effects, and in populations with an anaemia prevalence among pregnant women of less than 20%.[f]	Context-specific recommendation	X	X	X	X	X	X	X	X
Calcium supplements	**A.3:** In populations with low dietary calcium intake, daily calcium supplementation (1.5–2.0 g oral elemental calcium) is recommended for pregnant women to reduce the risk of pre-eclampsia.[g]	Context-specific recommendation	X	X	X	X	X	X	X	X
Vitamin A supplements	**A.4:** Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem,[h] to prevent night blindness.[i]	Context-specific recommendation	X	X	X	X	X	X	X	X
Zinc supplements	**A.5:** Zinc supplementation for pregnant women is only recommended in the context of rigorous research.	Context-specific recommendation (research)								
Multiple micronutrient supplements	**A.6:** Multiple micronutrient supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended								
Vitamin B6 (pyridoxine) supplements	**A.7:** Vitamin B6 (pyridoxine) supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended								

continued

e. The equivalent of 120 mg of elemental iron equals 600 mg of ferrous sulfate heptahydrate, 360 mg of ferrous fumarate or 1000 mg of ferrous gluconate.
f. This recommendation supersedes the previous recommendation in the 2012 WHO publication *Guideline: intermittent iron and folic acid supplementation in non-anaemic pregnant women* (55).
g. This recommendation is consistent with the 2011 *WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia* (57) and supersedes the previous recommendation found in the 2013 WHO publication *Guideline: calcium supplementation in pregnant women* (38).
h. Vitamin A deficiency is a severe public health problem if 5% of women in a population have a history of night blindness in their most recent pregnancy in the previous 3–5 years that ended in a live birth, or if 20% of pregnant women have a serum retinol level < 0.70 µmol/L. Determination of vitamin A deficiency as a public health problem involves estimating the prevalence of deficiency in a population by using specific biochemical and clinical indicators of vitamin A status.
i. This recommendation supersedes the previous recommendation found in the 2011 WHO publication *Guideline: vitamin A supplementation in pregnant women* (60).

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Vitamin E and C supplements	**A.8:** Vitamin E and C supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended								
Vitamin D supplements	**A.9:** Vitamin D supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.[j]	Not recommended								
Restricting caffeine intake	**A.10.1:** For pregnant women with high daily caffeine intake (more than 300 mg per day),[k] lowering daily caffeine intake during pregnancy is recommended to reduce the risk of pregnancy loss and low-birth-weight neonates.	Context-specific recommendation	X	X	X	X	X	X	X	X
B. Maternal and fetal assessment[l]										
Anaemia	**B.1.1:** Full blood count testing is the recommended method for diagnosing anaemia in pregnancy. In settings where full blood count testing is not available, on-site haemoglobin testing with a haemoglobinometer is recommended over the use of the haemoglobin colour scale as the method for diagnosing anaemia in pregnancy.	Context-specific recommendation	X		X			X		
Asymptomatic bacteriuria (ASB)	**B.1.2:** Midstream urine culture is the recommended method for diagnosing asymptomatic bacteriuria (ASB) in pregnancy. In settings where urine culture is not available, on-site midstream urine Gram-staining is recommended over the use of dipstick tests as the method for diagnosing ASB in pregnancy.	Context-specific recommendation	X		X		X			

continued

j. This recommendation supersedes the previous recommendation found in the 2012 WHO publication Guideline: vitamin D supplementation in pregnant women (75).
k. This includes any product, beverage or food containing caffeine (i.e. brewed coffee, tea, cola-type soft drinks, caffeinated energy drinks, chocolate, caffeine tablets).
l. Evidence on essential ANC activities, such as measuring maternal blood pressure, proteinuria and weight, and checking for fetal heart sounds, was not assessed by the GDG as these activities are considered to be part of good clinical practice.

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Intimate partner violence (IPV)	**B.1.3:** Clinical enquiry about the possibility of intimate partner violence (IPV) should be strongly considered at antenatal care visits when assessing conditions that may be caused or complicated by IPV in order to improve clinical diagnosis and subsequent care, where there is the capacity to provide a supportive response (including referral where appropriate) and where the WHO minimum requirements are met.m n	Context-specific recommendation	X	X	X	X	X	X	X	X
Gestational diabetes mellitus (GDM)	**B.1.4:** Hyperglycaemia first detected at any time during pregnancy should be classified as either, gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to WHO 2013 criteria.o	Recommended	X	X	X	X	X	X	X	X
Tobacco use	**B.1.5:** Health-care providers should ask all pregnant women about their tobacco use (past and present) and exposure to second-hand smoke as early as possible in the pregnancy and at every antenatal care visit.p	Recommended	X	X	X	X	X	X	X	X
Substance use	**B.1.6:** Health-care providers should ask all pregnant women about their use of alcohol and other substances (past and present) as early as possible in the pregnancy and at every antenatal care visit.q	Recommended	X	X	X	X	X	X	X	X

continued

m. Minimum requirements are: a protocol/standard operating procedure; training on how to ask about IPV, and on how to provide the minimum response or beyond; private setting; confidentiality ensured; system for referral in place; and time to allow for appropriate disclosure.

n. This recommendation is consistent with the 2013 publication *Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines* (86).

o. This is not a recommendation on routine screening for hyperglycaemia in pregnancy. It has been adapted and integrated from the 2013 WHO publication Diagnostic criteria and classification of hyperglycaemia first detected in pregnancy (94), which states that GDM should be diagnosed at any time in pregnancy if one or more of the following criteria are met:
- fasting plasma glucose 5.1–6.9 mmol/L (92–125 mg/dL)
- 1-hour plasma glucose ≥10.0 mmol/L (180 mg/dL) following a 75g oral glucose load
- 2-hour plasma glucose 8.5–11.0 mmol/L (153–199 mg/dL) following a 75g oral glucose load.

Diabetes mellitus in pregnancy should be diagnosed if one or more of the following criteria are met:
- fasting plasma glucose ≥7.0 mmol/L (126 mg/dL)
- 2-hour plasma glucose ≥11.1 mmol/L (200 mg/dL) following a 75g oral glucose load
- random plasma glucose ≥11.1 mmol/L (200 mg/dL) in the presence of diabetes symptoms.

p. Integrated from the 2013 publication WHO recommendations for the prevention and management of tobacco use and second-hand smoke exposure in pregnancy (96).

q. Integrated from the 2014 WHO publication *Guidelines for the identification and management of substance use and substance use disorders in pregnancy* (97).

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Type of intervention	Recommendation	Type of recommendation	Eight scheduled ANC contacts (weeks of gestation)							
			1 (12 weeks)	**2** (20 weeks)	**3** (26 weeks)	**4** (30 weeks)	**5** (34 weeks)	**6** (36 weeks)	**7** (38 weeks)	**8** (40 weeks)
Human immunodeficiency virus (HIV) and syphilis	**B.1.7:** In high prevalence settings,[r] provider-initiated testing and counselling (PITC) for HIV should be considered a routine component of the package of care for pregnant women in all antenatal care settings. In low-prevalence settings, PITC can be considered for pregnant women in antenatal care as a key component of the effort to eliminate mother-to-child transmission of HIV, and to integrate HIV testing with syphilis, viral or other key tests, as relevant to the setting, and to strengthen the underlying maternal and child health systems.[s]	Recommended	X							
Tuberculosis (TB)	**B.1.8:** In settings where the tuberculosis (TB) prevalence in the general population is 100/100 000 population or higher, systematic screening for active TB should be considered for pregnant women as part of antenatal care.[t]	Context-specific recommendation	X							
Daily fetal movement counting	**B.2.1:** Daily fetal movement counting, such as with "count-to-ten" kick charts, is only recommended in the context of rigorous research.	Context-specific recommendation (research)								
Symphysis-fundal height (SFH) measurement	**B.2.2:** Replacing abdominal palpation with symphysis-fundal height (SFH) measurement for the assessment of fetal growth is not recommended to improve perinatal outcomes. A change from what is usually practiced (abdominal palpation or SFH measurement) in a particular setting is not recommended.	Context-specific recommendation	X	X	X	X	X	X	X	X
Antenatal cardio-tocography	**B.2.3:** Routine antenatal cardiotocography[u] is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended								

continued

r. High-prevalence settings are defined in the 2015 WHO publication *Consolidated guidelines on HIV testing services as settings with greater than 5% HIV prevalence in the population being tested* (98). Low-prevalence settings are those with less than 5% HIV prevalence in the population being tested. In settings with a generalized or concentrated HIV epidemic, retesting of HIV-negative women should be performed in the third trimester because of the high risk of acquiring HIV infection during pregnancy; please refer to Recommendation B.1.7 for details.

s. Adapted and integrated from the 2015 WHO publication *Consolidated guidelines on HIV testing services* (98).

t. Adapted and integrated from the 2013 WHO publication *Systematic screening for active tuberculosis: principles and recommendations* (105).

u. Cardiotocography (CTG) is a continuous recording of the fetal heart rate and uterine contractions obtained via an ultrasound transducer placed on the mother's abdomen.

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Ultrasound scan	**B.2.4:** One ultrasound scan before 24 weeks of gestation (early ultrasound) is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience.	Recommended	X	X	X	X	X	X	X	X
Doppler ultrasound of fetal blood vessels	**B.2.5:** Routine Doppler ultrasound examination is not recommended for pregnant women to improve maternal and perinatal outcomes.[v]	Not recommended								
C. Preventive measures										
Antibiotics for asymptomatic bacteriuria (ASB)	**C.1:** A seven-day antibiotic regimen is recommended for all pregnant women with asymptomatic bacteriuria (ASB) to prevent persistent bacteriuria, preterm birth and low birth weight.	Recommended	X		X		X			
Antibiotic prophylaxis to prevent recurrent urinary tract infections	**C.2:** Antibiotic prophylaxis is only recommended to prevent recurrent urinary tract infections in pregnant women in the context of rigorous research.	Context-specific recommendation (research)								
Antenatal anti-D immunoglobulin administration	**C.3:** Antenatal prophylaxis with anti-D immunoglobulin in non-sensitized Rh-negative pregnant women at 28 and 34 weeks of gestation to prevent RhD alloimmunization is only recommended in the context of rigorous research.	Context-specific recommendation (research)								
Preventive anthelminthic treatment	**C.4:** In endemic areasw, preventive anthelminthic treatment is recommended for pregnant women after the first trimester as part of worm infection reduction programmes.x	Context-specific recommendation		X						

continued

v. Doppler ultrasound technology evaluates umbilical artery (and other fetal arteries) waveforms to assess fetal well-being in the third trimester of pregnancy.

w. Areas with greater than 20% prevalence of infection with any soil-transmitted helminths.

x. Consistent with the 2016 WHO publication *Guideline: preventive chemotherapy to control soil-transmitted helminth infections in high-risk groups* (140).

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Tetanus toxoid vaccination	**C.5:** Tetanus toxoid vaccination is recommended for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus.[y]	Recommended		X						
Malaria prevention: Intermittent preventive treatment in pregnancy (IPTp)	**C.6:** In malaria-endemic areas in Africa, intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) is recommended for all pregnant women. Dosing should start in the second trimester, and doses should be given at least one month apart, with the objective of ensuring that at least three doses are received.[z]	Context-specific recommendation	X (13 weeks)	X	X	X		X		X
Pre-exposure prophylaxis for HIV prevention	**C.7:** Oral pre-exposure prophylaxis (PrEP) containing tenofovir disoproxil fumarate (TDF) should be offered as an additional prevention choice for pregnant women at substantial risk of HIV infection as part of combination prevention approaches.[aa]	Context-specific recommendation								
D. Interventions for common physiological symptoms										
Nausea and vomiting	**D.1:** Ginger, chamomile, vitamin B6 and/or acupuncture are recommended for the relief of nausea in early pregnancy, based on a woman's preferences and available options.	Recommended	X	X	X	X	X	X	X	X
Heartburn	**D.2:** Advice on diet and lifestyle is recommended to prevent and relieve heartburn in pregnancy. Antacid preparations can be used to women with troublesome symptoms that are not relieved by lifestyle modification.	Recommended	X	X	X	X	X	X	X	X
Leg cramps	**D.3:** Magnesium, calcium or non-pharmacological treatment options can be used for the relief of leg cramps in pregnancy, based on a woman's preferences and available options.	Recommended	X	X	X	X	X	X	X	X

continued

y. This recommendation is consistent with the 2006 WHO guideline on *Maternal immunization against tetanus* (134). The dosing schedule depends on the previous tetanus vaccination exposure; please refer to Recommendation C.5 for details.

z. Integrated from the 2015 WHO publication *Guidelines for the treatment of malaria*, which also states: "WHO recommends that, in areas of moderate-to-high malaria transmission of Africa, IPTp-SP be given to all pregnant women at each scheduled antenatal care visit, starting as early as possible in the second trimester, provided that the doses of SP are given at least 1 month apart. WHO recommends a package of interventions for preventing malaria during pregnancy, which includes promotion and use of insecticide-treated nets, as well as IPTp-SP" (153). To ensure that pregnant women in endemic areas start IPTp-SP as early as possible in the second trimester, policy-makers should ensure health system contact with women at 13 weeks of gestation.

aa. Integrated from the 2015 WHO publication *Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV* (99). Substantial risk of HIV infection is defined by an incidence of HIV infection in the absence of PrEP that is sufficiently high (> 3% incidence) to make offering PrEP potentially cost-saving (or cost–effective). Offering PrEP to people at substantial risk of HIV infection maximizes the benefits relative to the risks and costs.

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Low back and pelvic pain	**D.4:** Regular exercise throughout pregnancy is recommended to prevent low back and pelvic pain. There are a number of different treatment options that can be used, such as physiotherapy, support belts and acupuncture, based on a woman's preferences and available options.	Recommended	X	X	X	X	X	X	X	X
Constipation	**D.5:** Wheat bran or other fibre supplements can be used to relieve constipation in pregnancy if the condition fails to respond to dietary modification, based on a woman's preferences and available options.	Recommended	X	X	X	X	X	X	X	X
Varicose veins and oedema	**D.6:** Non-pharmacological options, such as compression stockings, leg elevation and water immersion, can be used for the management of varicose veins and oedema in pregnancy, based on a woman's preferences and available options.	Recommended	X	X	X	X	X	X	X	X
E: Health systems interventions to improve utilization and quality of antenatal care										
Woman-held case notes	**E.1:** It is recommended that each pregnant woman carries her own case notes during pregnancy to improve continuity, quality of care and her pregnancy experience.	Recommended	X	X	X	X	X	X	X	X
Midwife-led continuity of care	**E.2:** Midwife-led continuity of care models, in which a known midwife or small group of known midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum, are recommended for pregnant women in settings with well functioning midwifery programmes.	Context-specific recommendation	X	X	X	X	X	X	X	X
Group antenatal care	**E.3:** Group antenatal care provided by qualified health-care professionals may be offered as an alternative to individual antenatal care for pregnant women in the context of rigorous research, depending on a woman's preferences and provided that the infrastructure and resources for delivery of group antenatal care are available.	Context-specific recommendation (research)	X	X	X	X	X	X	X	X

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Community-based interventions to improve communication and support	**E.4.1:** The implementation of community mobilization through facilitated participatory learning and action (PLA) cycles with women's groups is recommended to improve maternal and newborn health, particularly in rural settings with low access to health services.ab Participatory women's groups represent an opportunity for women to discuss their needs during pregnancy, including barriers to reaching care, and to increase support to pregnant women.	Context-specific recommendation	X	X	X	X	X	X	X	X
	E.4.2: Packages of interventions that include household and community mobilization and antenatal home visits are recommended to improve antenatal care utilization and perinatal health outcomes, particularly in rural settings with low access to health services.	Context-specific recommendation	X	X	X	X	X	X	X	X
Task shifting components of antenatal care delivery[ac]	**E.5.1:** Task shifting the promotion of health-related behaviours for maternal and newborn healthad to a broad range of cadres, including lay health workers, auxiliary nurses, nurses, midwives and doctors is recommended.	Recommended	X	X	X	X	X	X	X	X
	E.5.2: Task shifting the distribution of recommended nutritional supplements and intermittent preventive treatment in pregnancy (IPTp) for malaria prevention to a broad range of cadres, including auxiliary nurses, nurses, midwives and doctors is recommended.	Recommended	X	X	X	X	X	X	X	X
Recruitment and retention of staff in rural and remote areas[ae]	**E.6:** Policy-makers should consider educational, regulatory, financial, and personal and professional support interventions to recruit and retain qualified health workers in rural and remote areas.	Context-specific recommendation	X	X	X	X	X	X	X	X
Antenatal care contact schedules	**E.7:** Antenatal care models with a minimum of eight contacts are recommended to reduce perinatal mortality and improve women's experience of care.	Recommended	X	X	X	X	X	X	X	X

ab. Integrated from the 2014 publication WHO recommendations on community mobilization through facilitated participatory learning and action cycles with women's groups for maternal and newborn health (183).

ac. Including promotion of the following: care-seeking behaviour and ANC utilization; birth preparedness and complication readiness; sleeping under insecticide-treated bednets; skilled care for childbirth; companionship in labour and childbirth; nutritional advice; nutritional supplements; other context-specific supplements and interventions; HIV testing during pregnancy; exclusive breastfeeding; postnatal care and family planning; immunization according to national guidelines.

ad. Recommendations adapted and integrated from the 2012 WHO guideline on Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting (OptimizeMNH) (201).

ae. Adapted and integrated from the 2010 WHO publication Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations (202).

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