

Routine antenatal care

	8-12	17-19	24	28	32	36	38	40
History								
Complete	*							
Updated		(*)	*	*	*	*	*	*
Physical examination								
Blood Pressure	*		*	*	*	*	*	*
Maternal weight (BMI)	*		*	*	*	*	*	*
Fundal height			*	*	*	*	*	*
Fetal heart rate/movements			*	*	*	*	*	*
Leopolds maneuvers						*	*	*
Lab tests								
Hemoglobin	*			*				
Blood type and rhesus	*							
Antibody screen	*			anti-D				
Cervical cytology								
HbA1c/OGTT								
Urine dipstick	*	*	*	*	*	*	*	*
Urine culture (ABU)	*							
Syphilis serology	*							
PCR chlamydia/gonorrhoe								
Hepatitis B	*							
HIV serology	*							
Toxoplasmosis								
Rubella								
MRSA, VRE, ESBL								
Ultrasound screening		*						
Information, see text below			*		*	*	*	*
Referral post- term control								*

*: Routine screening of all pregnant women |: if indicated. Se text below



History:

General history:

Previous disease, especially gynecological conditions and abdominal surgery

Chronic diseases: refer to relevant specialist

Medication: assess if it is best to stop or continue medication (www.relis.no)- confer with relevant specialist

Family history: indication for genetic counselling, extra ultrasound, screening for GDM?

Lifestyle: indication for intervention?

Who to refer to relevant specialist: (have to ask to determine if indication is present)

- Severe asthma/allergy
- Age > 38 years
- Autoimmune disease (rheuma and antenatal outpatient clinic)
- Hereditary disease in the family Diabetes type 1, 2 and gestational diabetes
- Experience with violence
- Epilepsy
- More than one fetus
- Bariatric surgery
- Hematological disease
- HIV or Hepatitis B infections
- Cardiovascular disease
- Genital herpes (treat recurrent outbreaks and offer prophylaxis close to due date)
- Hyperemesis
- BMI < 18,5 kg/m² or > 35 kg/m²
- Genital mutilation
- Use of teratogenic/harmful medications
- Use of alcohol or illegal substances
- Kidney disease
- Psychiatric disease
- Socio-economic factors (language, education, income, marital status etc)
- Metabolic disease



Obstetric history:

Note in chronological order: Use logical abbreviations

- Year of pregnancy
- Gender and weight of offspring
- Gestational age
- Spontaneous/induced start of labor
- Mode of delivery (vaginal, vacuum/forceps/cesarean(acute/planned))
- Complications during pregnancy
- Complications during delivery (including previous traumatic experience for the patient)
- Complications postpartum (bleeding, infections etc)
- Complications in puerperium (breast feeding? Depression?etc)

Complications that should lead to extra attendance or referral:

- Postpartum hemorrhage
- Fetus with disease or developmental anomalies
- Post partum depression
- Intrauterine fetal death
- Preeklampsia, HELLP-syndrome, eclampsia
- Preterm birth
- RhD immunization, other irregular antibodies
- Multiple spontaneous abortions
- Traumatic labor/birth experience (refer for consultation at antenatal clinic)
- Previous cesarean section (more than 1 → refer, otherwise on indication, e.g. traumatic birth experience)
- Problems with breast feeding
- Growth restriction or macrosomia

Information/discussion

Week 24: Conversation about fetal movements. Most women will have felt the baby moving for several weeks. In the first pregnancy usually from week 14-16, in later pregnancies usually even earlier. The women should make note of their baby's normal movement pattern, and be taught to react if there is less/different movements.

Week 32: Conversation about breastfeeding and infant nutrition, and bonding (skin-to-skin contact, signals related to hunger, sleep, pain etc).

Week 36: Conversation about labor and post-partum period. Address any concerns or questions the women may have. Ask about tobacco and alcohol.

Week 38: Conversation about labor and post-partum period. Be aware of symptoms/risk factors for post-partum depression.



Physical examination

Blood pressure

Hypertensive disorders in pregnancy- determine baseline at 1st control (essential HT?)

Hypertensive disorders → increased risk of IUGR, IUFD, placental abruption, iatrogenous preterm birth, pulmonary edema, stroke (BP >150/100), superimposed preeclampsia, cesarean delivery. All pregnant women with HT should be referred to the Maternity Ward for antenatal evaluation and follow-up.

Gestational Hypertension

- Systolic BP \geq 140 or diastolic BP \geq 90 mm Hg for first time during pregnancy
- No proteinuria
- BP returns to normal before 12 weeks postpartum
- Final diagnosis made only postpartum
- May have other signs or symptoms of preeclampsia

Preeclampsia

- Systolic BP \geq 140 or diastolic BP \geq 90 mm Hg after 20 weeks gestation (but clinically must consider rise from baseline)
- Proteinuria \geq 300 mg/24 hours or \geq 1+ dipstick
- Severe preeclampsia: Systolic BP \geq 160 or diastolic BP \geq 110 mm Hg, cerebral or visual disturbance, upper right quadrant pain, pulmonary edema or cyanosis, general malaise

HELLP-Syndrome

- HELLP= Hemolysis - Elevated Liver enzymes - Low Platelets.
- In general practice: Be aware of general malaise/preeclampsia symptoms and/or right upper quadrant pain in pregnant women
- Differential diagnosis: Severe preeclampsia, acute fatty liver of pregnancy
- Elevated blood pressure not necessary to meet preeclampsia criteria
- Hemolysis is diagnosed by low S- haptoglobin (<0,2 g/l) and increased bilirubin and/or LD.
- Liver affection is diagnosed by elevated levels of ASAT, ALAT and LD.
- Thrombocyte count $<100 \times 10^9/l$

Eclampsia

- Seizures in a pregnant woman is eclampsia until proven otherwise. Transport to Labor Ward immediately

Chronic Hypertension

- BP \geq 140/90 mm Hg before pregnancy or diagnosed before 20 weeks' gestation not attributable to gestational trophoblastic disease
- Treatment goal: BP <150/100. Use appropriate medication (e.g. not ACE-inhibitors)



Maternal Weight

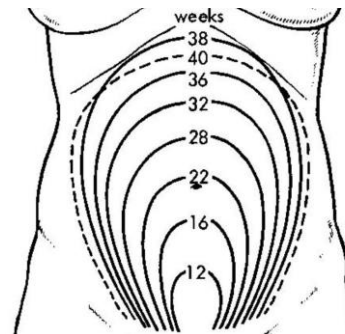
Recommended Ranges of Weight Gain During Singleton Gestations Stratified by Prepregnancy BMI

Weight-for-Height Category		Recommended Total Weight Gain	
Category	BMI	kg	Lb
Low	< 19.8	12.5-18.0	28-40
Normal	19.8-26	11.5-16.0	25-35
High	26-29	7.0-11.5	15-25
Obese	> 29	≥ 7.0	≥ 15.0

23rd Edition Williams Obstetrics, page 201

SF-height

- Between 20 and 34 weeks, the height of the uterine fundus measured in centimeters correlates closely with gestational age in weeks.
- The fundal height should be measured as the distance over the abdominal wall from the upper edge of the symphysis pubis to the top of the fundus.
- The bladder must be emptied before making the measurement.
- Should, if possible, be performed by the same examiner during the pregnancy
- Is only feasible in case of a singleton fetus in longitudinal lie
- Using the fundal height alone, fetal-growth restriction may be undiagnosed in up to a third of cases.
- **High SF-measurement:**
 - Incorrect term date
 - Multiple gestation
 - Large fetus
 - Adiposity
 - Polyhydramnios
 - Mass (e.g. placenta previa, fibroid)
- **Low or stagnating SF-measurement:**
 - Incorrect term date
 - Intrauterine growth restriction
 - Oligohydramnios
 - Rupture of membranes



Fetal heart rate (110 – 150/160 bpm)

Best heard on the fetal back, between the scapulae. Assessed by Pinard stethoscope or Doppler from 23-24 weeks. In early pregnancy we allow a FHR of 160, but in the last trimester 150 is the cutoff. Be aware of the fetus' baseline. They will normally keep a much narrower individual range. A fetus with a "personal range" of 110-120 will not normally present with a FHR of 15

Leopold's Maneuvers

Terminology

Situs (no: leie, eng: lie)

Fetal longitudinal axis related to mother's longitudinal axis, e.g. longitudinal vs transversal

Presentatio (no: presenterende del, eng: presenting part)

Leading (=most descended in pelvis) bony part of fetus

Position (no: posisjon, eng: position)

To what side of the mother the fetus' back is directed (1st=left side, 2nd=right side)

Altitude (no: stand, eng: station)

How far the leading part has descended

Habitus (no: holdning, eng: attitude)

Fetal head in relation to fetal body

Engagement: the presenting part is said to be engaged (no: festet) when it is locked in the pelvis and therefore cannot be made to ballot between the fingers.

What to decide by the different maneuvers

1st maneuver

- What part of the fetus is in the fundus? (Verify 4th maneuver)

2nd maneuver

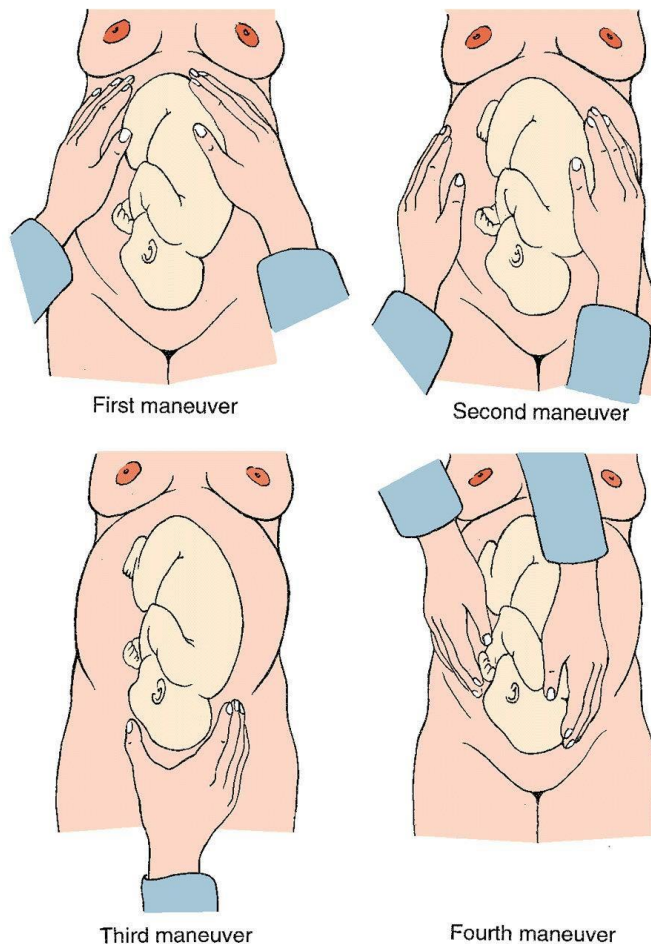
- Position?
- Lie?

3rd maneuver

- Presenting part?
- Station/engagement?

4th maneuver

- Presenting part when this is difficult to decide by 3rd maneuver
- Attitude? (this is difficult and not expected to be mastered by students)



Laboratory tests

Hemoglobin (Hgb or Hb)

ANEMIA	
1 st trimester	Hgb < 11.0 g/dL
28 weeks	Hgb < 10.5 g/dL

If anemic:

- MCV: If <82: microcytic anemia
- If S-ferritin below 12ug/L → Iron supplementation (and testing for occult blood in stool)
- Other causes than iron-deficiency and thalassemia minor in pregnancy → refer to specialist care

Iron deficiency and acute blood loss

The two most common causes of anemia in pregnancy and the puerperium are iron deficiency and acute blood loss. Iron deficiency anemia during pregnancy has been associated with an increased risk of low birth weight, preterm delivery, and perinatal mortality. Pregnant women with iron deficiency anemia should be treated with supplemental iron.

Patients with anemia other than iron deficiency anemia should be further evaluated

For example Hgb electrophoresis (for sickle cell trait in African-Americans; for β -thalassemia in Mediterranean/Italians), genetic testing for α -thalassemia in Mediterranean/Italians (especially if anemia unresponsive to iron supplementation). If suspected; refer to hematologist

Test	Results Indicating Iron Deficiency Anemia	Results Indicating Thalassemia	Results Indicating Anemia of Chronic Disease
Iron level	Decreased level	Normal	Decreased level
Total iron-binding capacity	Increased capacity	Normal	Decreased capacity
Ferritin level	Decreased level	Normal	Increased level
Iron/total iron-binding capacity	Less than 18%	Normal	More than 18%

Blood type and Rh factor

ABO Blood Group System

Although incompatibility for the major blood group antigens A and B is the most common cause of hemolytic disease in the newborn, the resulting anemia is usually mild. ABO isoimmunization is a disease of pediatric rather than obstetrical concern. Although there is no need for antenatal monitoring, careful neonatal observation is essential because hyperbilirubinemia may require treatment. Treatment usually consists of phototherapy or simple/exchange transfusion with O-negative blood.

Rhesus Blood Group System

15% of women are Rh(D)-negative. If the father of the offspring is Rh(D)-positive there is risk of Rh(D) alloimmunization. The fetus is at risk of hemolytic anemia which can range from mild to life-threatening.

Antibody screen week 12

Rh(D) negative + Anti-Rh(D) negative

- New test with antenatal (fetal) Rh(D)-typing in week 24 and anti(D)-prophylaxis week 28 in Rh(D) positive fetus.

Rh(D) negative + Anti-Rh(D) positive (antibodies detected in maternal blood on first screening)

- New test in week 18 week with antenatal Rh(D)-typing
- If anti-D titer \geq 128 and Rh(D)-positive fetus: Refer patient to antenatal outpatient clinic



Screening for gestational diabetes

(www.helsedirektoratet.no/retningslinjer/svangerskapsdiabetes)

1st antenatal control: *Assess risk factors:*

- Ethnicity (Asia and Africa),
- 1st degree relative with diabetes
- pre-pregnant BMI >30
- previous macrosomia (>4,5kg)
- previous gestational diabetes, pregnancy
- labour complications associated with gestational diabetes (shoulder dystocia, preeclampsia).

If risk factor present → Hba1c (not useful after gestational week 16 or in cases where hemoglobin is affected (anemia, chronic malaria, transfusions)

HbA1c > 41-47 mmol/mol (5,9-6,4%): refer for education in self monitoring and dietary advice. Treatment goals: fasting blood sugar <5,3 and 2-hours post prandial < 6,7.

If treatment goals not met: refer endocrinologist.

HbA1c ≥ 48 mmol/mol (≥ 6,5 %); diagnostic criteria for diabetes met: refer endocrinologist and antenatal outpatient clinic.

Week 24-28: Oral glucose tolerance test (OGTT)

The test should only be performed in pregnant women at increased risk of gestational diabetes (GDM). The test should be performed in week 24-28 (also in patients with a normal Hba1c in the 1st trimester). NB! OGTT should NOT be performed in the case of manifest diabetes (fasting blood sugar > 5,3), or in patients after bariatric surgery (should instead self-monitor before and after meals).

Indication for screening:

- age > 24 years in primipara
- age >40 in multiparas
- ethnicity (Asia, Africa)
- type 1- or type 2-diabetes in parents or siblings
- BMI > 25 kg/m² at the beginning of pregnancy
- Gestational diabetes in previous pregnancy
- Previous macrosomia (birth weight >4,5kg)
- Previous pregnancy or labor complications associated with gestational diabetes
- Please note: Glucosuria is NOT a criteria for OGTT

Results and interpretation:

	Gestational diabetes	Diabetes
Fasting glucose	5,3-6,9 mmol/L	>6,9 mmol/L
2-hour value	9,0-11,0 mmol/L	>11 mmol/L

Gestational diabetes: Dietary and lifestyle advice. Education in self-monitoring of blood sugar. Treatment goal: Fasting blood sugar <5,3 and 2-hours post prandial < 6,7. Refer to antenatal outpatient clinic in week 36 for fetal growth assessment.

Refer to endocrinologist when: Treatment goals are not met.



Urine protein assessment

Urine dipstick to screen for proteinuria is associated with frequent false-positive and false-negative results, especially when the urine is particularly concentrated or dilute, respectively. It is most predictive of abnormal 24-hour proteinuria if +2 or greater. The best quality test is obtained through *clean midstream morning urine*.

Preeclampsia is the most common cause of proteinuria in pregnancy and **must be excluded** in all women with proteinuria first identified after 20 weeks of gestation. If preeclampsia is excluded, then the presence of primary or secondary renal disease should be considered.

Urine culture

Pregnant women commonly have less symptoms of UTIs than non-pregnant women, and hence a higher risk of developing ascending UTIs (pyelonephritis). Asymptomatic bacteriuria is associated with preterm birth and neonatal sepsis in the case of group B streptococci colonization (see below).

All women should be screened for asymptomatic bacteriuria (ABU) at the first control.

Positive culture: $\geq 10^5$ uropathogenic bacteria/mL: repeat urine culture within one week.

If confirmed same microbe, antibiotics are given according to resistance pattern.

If recurrent bacteriuria, the patient should be treated again according to the resistance pattern.

Cystitis in pregnancy: treat for 7 days.

NB! This is *also true for GBS detected in urine*. Contamination of the urine sample from vaginal bacteria are common. It is therefore important that the sample should be from a clean, midstream morning urine. See below for handling.

Cervical cytology

Every woman in Norway between 25 and 70 years of age is recommended to *follow the cervical cytology screening program*. If the time for the test is during pregnancy, this test should be offered early in the pregnancy. Otherwise cervical cytology during pregnancy on indication. Pregnant women will more commonly present with symptoms that would otherwise prompt a cervical cytology, i.e. vaginal bleeding. A reasonable approach is to take a cervical cytology if it is more than 1 year since the last normal cervical cytology. Pregnant women with untreated cervical dysplasia are followed by a gynecologist with regular controls throughout pregnancy.

Rubella serology - *If nonimmune/low titer:* Recommend vaccination after delivery

Although Rubella is part of the regular vaccine program in Norway, titer will usually drop if not given a booster in adulthood. Unless a booster has been given, Rubella serology should be taken, in practice this means most women. Rubella is one of the most teratogenic agents known with the sequela of fetal infection being worst during organogenesis. There is no specific treatment for rubella.

Syphilis serology - Routine serologic screening test for syphilis at first prenatal visit

Although syphilis is rare in the native Norwegian population, the prevalence is rising, and the consequences of untreated syphilis in pregnancy are potentially catastrophic.

- *If negative:* Repeat serologic screening in third trimester in high-risk patient, for example women from Eastern Europe or Africa.
- *If positive:* Refer to hospital



Chlamydia test

Only routinely in women aged <25 years

- *If negative:* Consider repeat screening in third trimester in high-risk pregnancies.
- *If positive:* Treat with Azitromycin 1g as a single dose.
- If azitromycin is contraindicated → Amoxicillin 500mg x 3 for 7 days.
- In asymptomatic women treatment should be postponed to after 1st trimester.
- Symptomatic women should be treated immediately.
 - Control 5-6 weeks after treatment (not before, as the risk of a false positive is then high)

HIV serology

If positive:

Refer to specialist in infectious medicine and obstetrician

Hepatitis B serology

A pregnant woman should be offered serological testing for hepatitis B

- *If showing active infection:*
 - Consult specialist in infectious diseases

Hepatitis C serology

A test should be taken for hepatitis C virus if the woman provides information that indicates the need for a test, e.g.:

- Previously or presently abusing drugs iv
- Received blood-transfusion in Norway before 1983
- Received blood-transfusion outside the Nordic countries
- Sexual partner with a person abusing drugs iv
- Stayed in high-endemic area
- Tattoo

Group B streptococcus culture

15-20% of Norwegian women are colonized with GBS in the vagina/rectum, and it will usually not cause problems. No screening in Norway. However, if present in the urine, it is a sign of high bacterial count, and the risk of complications is higher.

- *If streptococci group B. is detected in the urine:*
 - this should be **noted on the health record card** for pregnant women, so that the maternity unit can give antibiotic prophylaxis (penicillin i.v.) during the birth.
 - The bacteriuria should be treated according to resistance pattern (usually penicillin sensitive in Norway), and the women controlled as described earlier (see Urine culture above). Contamination from the vagina is a common problem, instruct patients in how to perform a clean, midstream morning urine sample.



MRSA, ESBL, VRLE

Test from nostrils, pharynx, perineum, wounds, eczema, catheter urine if:

- Previously MRSA-positive, without three consecutive negative tests
- Within last 12 months:
 - MRSA-positive, even if later tests have been negative
 - Lived in the same household as an MRSA-positive person
 - Been in close contact with an MRSA-positive person without using necessary protection
 - Admitted to hospital/outpatient clinic outside Nordic countries
 - Worked in health care outside Nordic countries
 - Been to orphanage or refugee camp outside Nordic countries

If positive, note on health card. For MRSA, include information on negative controls on the health card, as patients will be treated with isolation until 3 negative controls are documented.

Fetal aneuploidy screening – (Aneuploidy: Abnormal number of chromosomes)

Major chromosomal abnormalities include trisomy 21 (Down syndrome), trisomy 18 (Edwards syndrome), trisomy 13 (Patau syndrome) and sex chromosomal disorders such as 47,XXY (Klinefelter syndrome) and 45,X (Turner syndrome).

- *First trimester risk assessment at 11-14 week (refer as soon as possible for patients that qualify):*
Incorporates nuchal translucency and the two maternal serum analyte markers, pregnancy-associated plasma protein-A (PAPP-A) and β -subunit of human chorionic gonadotropin (β -hCG).
Only in selected groups:
 - Women aged >38 years at estimated day of delivery
 - Women and/or partner who previously have had a child with neural tube defect or chromosomal abnormality
 - Women or couples who previously have had a child with an inborn error of metabolism where prenatal detection is possible
 - Women or couples who previously have had a child with serious X-bound recessive disease, or where there is a high risk for the woman to be carrier for a disease like this
 - Where one of the parents is carrier of a chromosomal anomaly and therefore has a high risk of having a child with a serious developmental disorder
 - Woman who have received teratogenic medication
 - Women using antiepileptic medication
 - In selected cases women or couples who are in a difficult life situation, and who think they cannot cope with the extra stress a disabled child might bring, may be offered prenatal diagnostics.
 - If the woman expresses concerns about her baby not developing normally, this might be a reason for prenatal diagnostics.



Useful links in Norwegian for details on antenatal care routines:

<https://www.helsedirektoratet.no/retningslinjer/svangerskapsomsorgen>

<https://www.helsedirektoratet.no/retningslinjer/svangerskapsdiabetes>

<https://relis.no/>

<https://legeforeningen.no/Fagmed/Norsk-gynekologisk-forening/Veiledere/Veileder-i-fodselshjelp-2014/Kap-1-Svangerskapsomsorg/>

<https://legeforeningen.no/Fagmed/Norsk-gynekologisk-forening/Veiledere/>

<https://www.antibiotikaiallmenpraksis.no>

Last ned NGFs APP med veiledere I gynekologi, obstetrikk og gyn-onkologi gratis.

Contact information:

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Sources:

- A National Clinical Guideline for Antenatal Care, Directorate for Health and Social Affairs, Norway, 2019
- www.uptodate.com
- ACOG Practice Bulletins
- Guidelines in Obstetrics 2014, Norwegian Society for Gynecology and Obstetrics (in revision)
- National Guidelines for Antibiotic Treatment in Primary Care, Norwegian Directorate of Health, 2013 (in revision)

