Routine antenatal care

Routine antenatal care in Norway
Healthy pregnant women with singleton pregnancies

	First visit 8-12	17-19	24	28	32	36	38	40
History								
Complete	•							
Updated		(•)	•	•	•	•	•	•
Physical examination								
Blood pressure	•		•	•	•	•	•	•
Maternal weight	•		•	•	•	•	•	•
Fundal height			•	•	•	•	•	•
Fetal heart rate/movements			•	•	•	•	•	•
Fetal lie, presenting part and engagement						•	•	•
Laboratory tests								
Hemoglobin	•			•				
Blood type and Rh factor	•							
Antibody screen	•					I		
Pap smear screening	I							
Glucose tolerance test	I			I				
Ultrasound screening	I	•						
Urine dipstick testing	•		•	•	•	•	•	•
Urine culture	•							
Rubella serology	•							
Syphilis serology	•							I
Chlamydial culture	I							
Hepatitis B/C serology	I							
HIV serology	•							

I: if indicated. Se text below
Modified after: A National Clinical Guideline for Antenatal Care, Directorate for Health and Social Affairs, Norway, 2005

Physical examination

Blood Pressure

Measure blood pressure as outlined below:

- remove tight clothing, ensure arm is relaxed and supported at heart level
- use cuff of appropriate size
- inflate cuff to 20–30 mmHg above palpated systolic blood pressure
- lower column slowly, by 2 mmHg per second or per beat
- read blood pressure to the nearest 2 mmHg
- measure diastolic blood pressure as disappearance of sounds (phase V).

Gestational Hypertension

- Systolic BP ≥ 140 or diastolic BP ≥ 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 ≥ 140 or diastolic BP ≥ 90 mm Hg after 20 weeks gestation
- Proteinuria ≥ 300 mg/24 hours or ≥ 1+ dipstick

Severe Preeclampsia

Preeclampsia + one or more of the following criteria:

- Systolic BP ≥ 160 or diastolic BP ≥ 110 mm Hg on two occasions at least 6 hours apart while the patient is on bed rest
- Proteinuria ≥ 5 g/24 hours or ≥ 3+ dipstick on two random samples collected at least 4 hours apart
- Oliguria < 500 mL/24 hours
- Cerebral or visual disturbances
- Pulmonary edema or cyanosis
- Epigastric or right upper-quadrant pain
- Impaired liver function
- Thrombocytopenia
- Fetal growth restriction
-

HELLP-Syndrome

- HELLP= Hemolysis - Elevated Liver enzymes - Low Platelets.
- Hemolysis is diagnosed by low S- haptoglobin (<0,2 g/l) and increased bilirubin and/or LD.
- Liver affection is diagnosed by eleveated levels of ASAT, ALAT and LD.
- Thrombocyte count <100 x 10^9/l [4]

Eclampsia

- Seizures that cannot be attributed to other causes in a woman with preeclampsia

Superimposed Preeclampsia on Chronic Hypertension

- New-onset proteinuria ≥ 300 mg/24 hours in hypertensive women but no proteinuria before 20 weeks' gestation
- A sudden increase in proteinuria or BP or platelet count < 100 000/µl in women with hypertension and proteinuria before 20 weeks' gestation

Chronic Hypertension

- BP ≥ 140/90 mm Hg before pregnancy or diagnosed before 20 weeks' gestation not attributable to gestational trophoblastic disease
  OR
- Hypertension first diagnosed after 20 weeks' gestation and persistent after 12 weeks postpartum

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 top 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 – 160 bpm)

Instruments incorporating Doppler ultrasound instruments

Detects fetal heart action almost always by 12 weeks.

Fetal stethoscope (Pinard's stethoscope)

The fetal heart can first be heard in most women between 16 and 19 weeks, in all by 22 weeks.

Leopold's Maneuvers

Terminology

Situs (no: leie, eng: lie)
Fetal longitudinal axis related to mothers 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)
Altitudo (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.

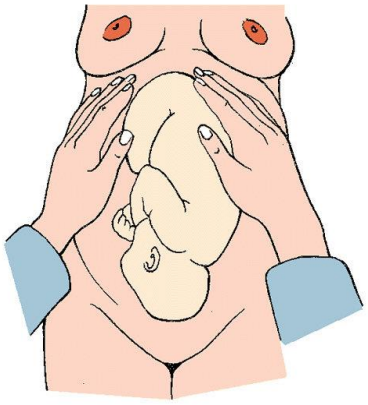
What to decide by the different maneuvers

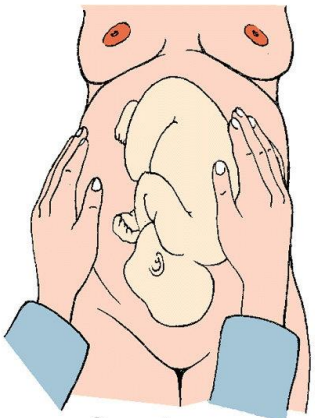
1st maneuver
- What part of the fetus is in the fundus? (Verify 4th maneuver)

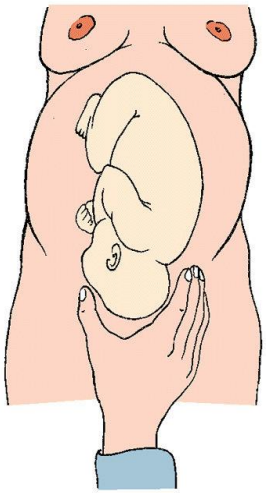
2nd maneuver
- Position?
- Lie?

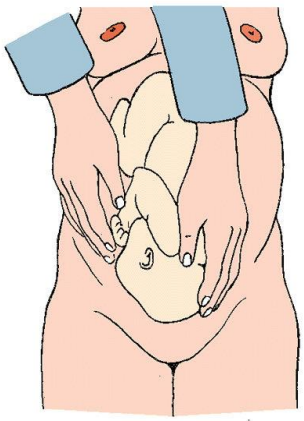
3rd maneuver
- Presenting part?
- Station/engagement?

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)


First maneuver


Second maneuver


Third maneuver


Fourth maneuver

Laboratory tests

Hemoglobin (Hgb or Hb)

ANEMIA	
1st 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 to mild to life-threatening.

Antibody screen week 12

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

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

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

- New test in week 18 week with antenatal Rh(D)-typing
- If anti-D titre ≥ 128 and Rh(D)-positive fetus: Refer pasient to obstetrical outpatient clinic

Prophylaxis within 72 hours after labour to Rh(D)-negative women with an Rh(D)-positive child.

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 as early as possible in pregnancy and in week 26-28. OGTT should also be performed in the case of glucosuria. If persistent glucosuria and normal OGTT; repeat OGTT in 4-6weeks. Criteria for being at increased risk are:

- age > 38 years
- type 1- or type 2-diabetes in parents or siblings
- BMI > 27 kg/m2 at the beginning of pregnancy
- Gestational diabetes in previous pregnancy
- immigrants from the Indian subcontinent, including Sri Lanka, or North-Africa

Results after 2 hours and handling

<7,8mmol/l: No glucose intolerance. General advice about physical activity and diet. New test after 4-6weeks, or earlier in 3rd trimester if glucosuria is detected
7,8-9mmol/l: Thorough advice about diet and physical activity. New test after 4-6weeks, or earlier in 3rd trimester if glucosuria is detected
>9mmol/l: Refer to obstetric outpatient clinic

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. Positive urine dipsticks should be followed-up with a quantitative test, most commonly the urinary albumen-to-creatinine ratio.

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 (to reduce the incidence of pyelonephritis)

All women should be screened for asymptomatic bacteriuria at the first control. (Asymptomatic bacteriuria: ≥ 10^5 uropathogenic bacteria/mL in two following tests with the same microbe and resistence pattern in a person without urinary symptoms). If confirmed, antibiotics are given and new urinary cultures are taken every four week during pregnancy. If recurrent bacteriuria, the patient should be treated again according to the resistence pattern.

Pap smear

Every woman in Norway between 25 and 70 years of age is recommended a cervical smear every third year. If the time for the test is during pregnancy, then this test should be offered early in the pregnancy. Otherwise Pap smear during pregnancy only on indication.

Rubella serology - *If nonimmune:* Recommend vaccination after delivery

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

- *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

Chlamydiatest

Only routinely in women aged <25 years

- *If negative:* Consider repeat screening in third trimester in high-risk pregnancies.
- *If positive:* Treat with Amoxicillin (500mg x 3 for 7 days or clindamycin (for 2 weeks).
    - *Control 5*-6 weeks after treatment

HIV serology

If positive:
Refer to specialist in infectious medicine and obstetrician

Hepatitis B serology

A pregnant woman should be offered serological testing for hepatits B if she, her previous sexual partner, or her present sexual partner:

- Was born or has grown up in a high-endemic area
- Previously or presently is abusing drugs iv
- Has received blood-transfusion abroad
- Has had sexual contact with a person abusing drugs iv or a bisexual man
- Has been exposed to Hepatits B through work
- Has previousy had Hepatits B

It is important to offer tests to pregnant women who many years ago arrived in Norway as adoptees or immigrants from high-endemic countries.

- *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
- Recieved blood-transfusion in Norway before 1983
- Recieved blood-transfusion outside the Nordic countries
- Sexual partner with a person abusing drugs iv
- Stayed in high-endemic area
- Tatoo

Group B streptococcus culture

No screening in Norway (in other countries, e.g. USA, all women are offered screening and carriers are treated in the third trimester)

- *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. If there at time of testing are clinical signs of UTI, this should be treated.

Preterm premature rupture of membranes (PPROM):

- Antibiotics is given until the women has delivered or infection is ruled out

Antibiotics for GBS intrapartum is given in the following situations:

- Previous delivery of a baby with serious GBS-infection
- GBS UTI or bacteriuria in this pregnancy
- Detected GBS in the birth canal/rectum and one of the following:
  - Preterm labour
  - Rupture of membranes >18h before the baby is delivered

Meticillin resistant staphylococcus aureus (MRSA)

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

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 weeks:*
  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 recieved 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.

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Sources:

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