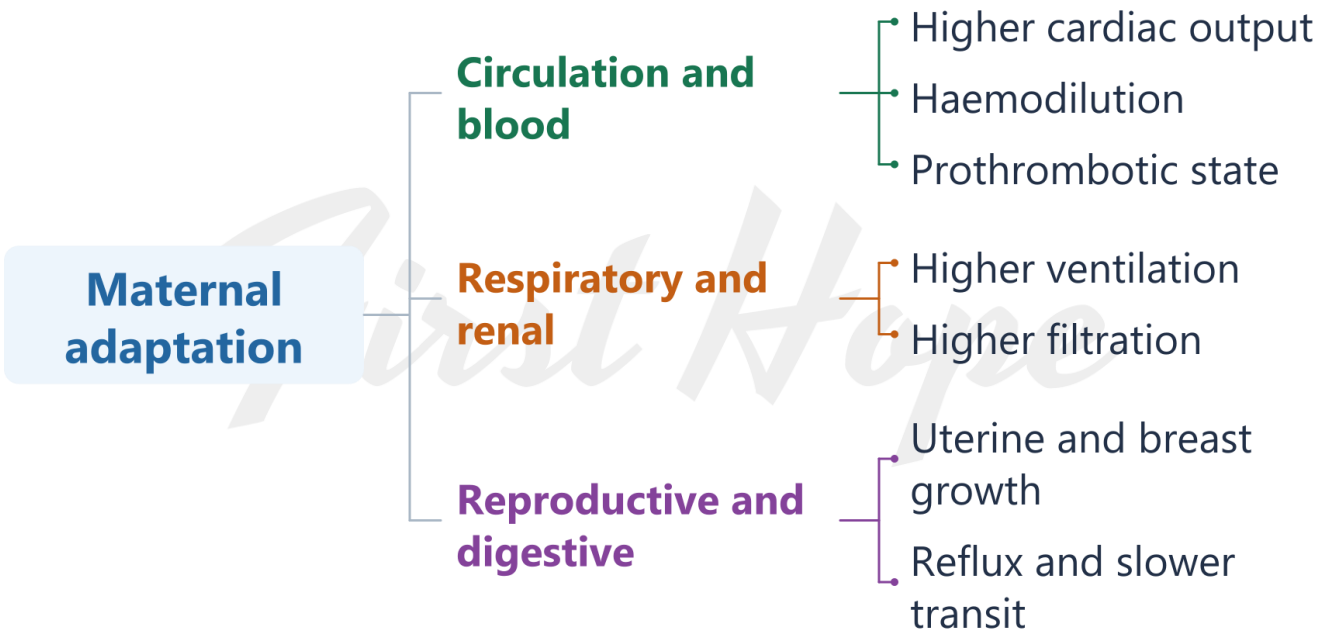
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Obstetrics & Gynaecology - Topic 7 - Maternal Changes in pregnancy

Why the Maternal Body Changes

Adaptation to Pregnancy

- Pregnancy changes many organs so that the mother can support fetal growth, prepare for birth and produce milk afterwards.
- Hormonal effects, increased metabolic demand and the growing uterus act together to produce these adaptations.
- Some changes resemble disease, so interpretation must consider the stage of pregnancy and the woman's symptoms.
- Normal adaptation should never be used to dismiss severe, progressive or unusual symptoms.



Interpreting Clinical Findings

- Compare a result with an appropriate pregnancy reference range when one is available.
- Look at the pattern and trend rather than treating a single value as the whole diagnosis.
- An expected change can coexist with disease, such as physiological haemodilution with additional iron deficiency.
- Recognising the normal pattern helps the clinician identify when assessment or treatment is needed.

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Genital Tract and Breast

Uterus and Cervix

Uterine Growth

- The uterus enlarges through growth of muscle cells, early cellular proliferation and stretching as its contents increase.
- Uterine blood flow increases substantially to support placental exchange.
- The uterus rises out of the pelvis and becomes an abdominal organ as pregnancy advances.
- Irregular Braxton Hicks contractions may occur, but progressive painful contractions with cervical change suggest labour.
- The lower uterine segment develops in late pregnancy and labour, which is relevant to delivery and caesarean surgery.

Cervical Changes

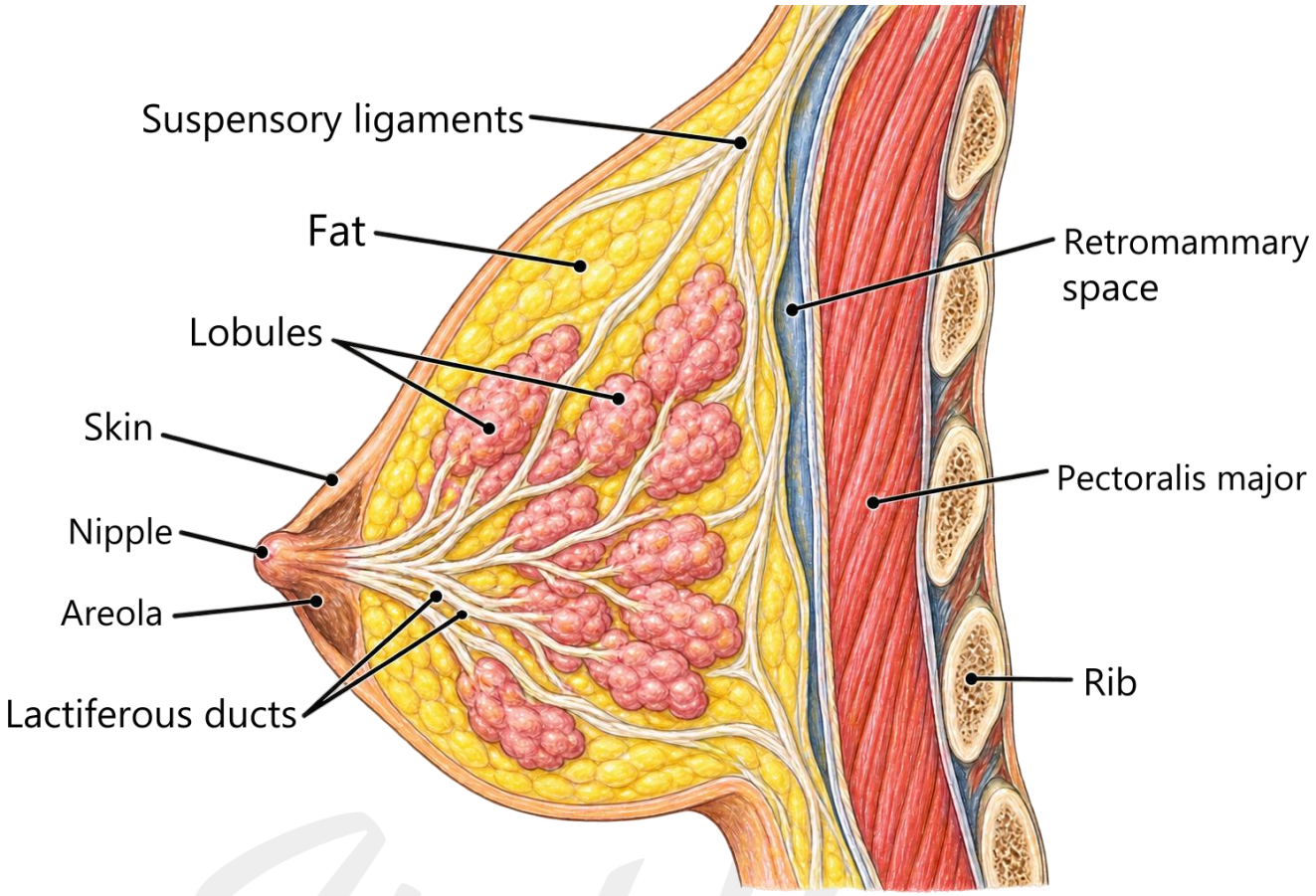
- Increased vascularity and tissue hydration soften the cervix.
- Cervical glands produce mucus that contributes to the mucus plug during pregnancy.
- Later biochemical remodelling allows cervical ripening, effacement and dilatation for birth.
- Bleeding from the cervix may occur with local disease, but vaginal bleeding should not be assumed to be a harmless pregnancy change.

Vagina and External Genitalia

- Increased blood flow can give the vaginal mucosa a deeper colour, and the tissues become more compliant.
- A thin white or milky discharge may increase because of hormonal and glandular activity.
- Itching, offensive smell, pain, dysuria or blood-stained discharge suggests a cause that needs assessment.
- Increased venous pressure can contribute to vulval varicosities, especially later in pregnancy.
- Sudden fluid leakage requires assessment for ruptured membranes rather than being labelled ordinary discharge.

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Breast Adaptations Supporting Lactation



The ducts and lobuloalveolar tissue develop during pregnancy in preparation for milk production after birth

Structural Changes

- Breasts often enlarge and become tender as ducts and glandular tissue develop.
- Oestrogen promotes ductal growth, while progesterone contributes to development of the milk-producing lobuloalveolar system.
- The nipples and areolae become more prominent, and pigmentation may increase.
- Areolar glands become more visible and contribute protective secretions.

Hormonal Control

- Prolactin supports milk synthesis, but high placental steroid levels limit copious milk production during pregnancy.
- After placental delivery, the fall in progesterone and oestrogen permits secretory activation in the presence of prolactin.
- Suckling later supports prolactin release and oxytocin-mediated milk ejection.
- Colostrum may be present before birth, but its presence or absence does not reliably predict later milk supply.
- A persistent focal mass, skin retraction or bloody unilateral nipple discharge needs assessment even during pregnancy.

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Cardiovascular Adaptation

Blood Volume and Cardiac Output

- Maternal circulating volume expands to support the uterus, placenta and other organs and to provide reserve for blood loss at birth.
- Cardiac output increases through changes in stroke volume and heart rate.

Vascular Resistance and Blood Pressure

- Systemic vascular resistance falls because the maternal circulation becomes more dilated.
- Blood pressure often falls in mid-pregnancy before moving towards earlier levels later in gestation.

Normal Cardiac Findings and Warning Signs

- A mild increase in pulse and a soft systolic flow murmur can occur in a healthy pregnancy.
- Persistent marked tachycardia, a diastolic murmur, syncope or signs of heart failure require investigation.

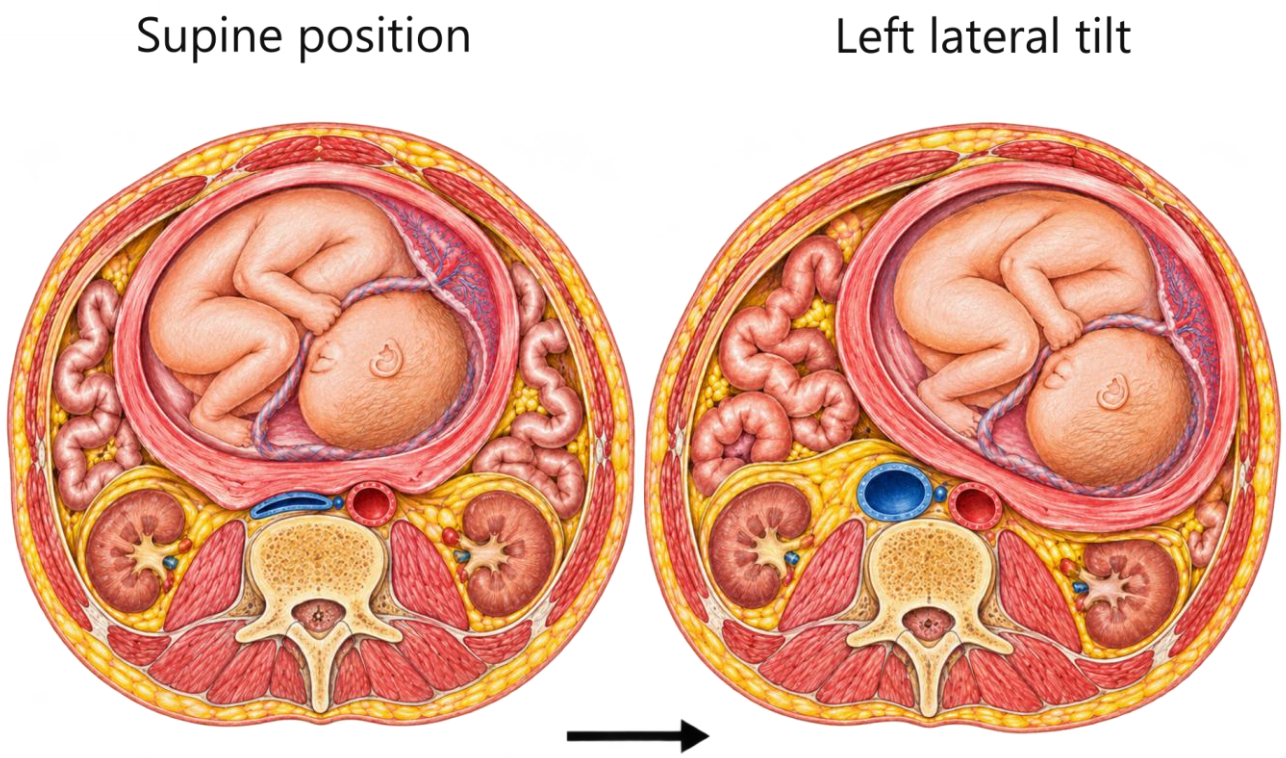
Approximate Magnitude of Normal Circulatory Change

Measure	Typical pregnancy change and meaning
Plasma volume	It rises by roughly 40–50%, with variation by gestational stage and the individual.
Cardiac output	It rises by approximately 30–50% through increased stroke volume and heart rate.
Resting heart rate	It commonly rises by about 10–20 beats per minute.
Vascular resistance	It falls, helping explain the usual mid-pregnancy decrease in blood pressure.

- These figures describe broad physiological patterns and are not diagnostic thresholds for an individual patient.

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Venous Effects and Position



In late pregnancy, lying supine can compress the vena cava, while a left lateral position reduces the pressure

Dependent Venous Pressure

- The enlarged uterus can impede venous return from the lower limbs.
- Dependent ankle swelling, varicose veins and haemorrhoids may therefore become more noticeable.
- Bilateral mild ankle oedema alone does not diagnose pre-eclampsia.
- Unilateral painful leg swelling requires urgent assessment for venous thrombosis.

Supine Hypotension

1. Supine gravid uterus → 2. Reduced caval return → 3. Lower cardiac output → 4. Dizziness or hypotension

- In late pregnancy, lying flat can allow the uterus to compress the inferior vena cava and reduce venous return.
- This can lower cardiac output and cause pallor, nausea, dizziness or hypotension.
- Turning the woman onto her left side or using appropriate uterine displacement can improve venous return.
- Persistent symptoms despite repositioning need assessment for other causes such as bleeding, arrhythmia or pulmonary embolism.

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