

NORMAL PREGNANCY

REGARDLESS OF THE CHIEF COMPLAINT, THE POSSIBILITY OF PREGNANCY MUST BE CONSIDERED IN EVERY WOMAN OF REPRODUCTIVE AGE WHO PRESENTS TO THE ED

THE USE OF BARRIER METHODS, CONTRACEPTIVE AND EVEN STERILISATION DOES NOT GUARANTEE PREGNANCY PREVENTION

TERMINOLOGY:

- GRAVIDITY → total number of pregnancies regardless of duration and outcome
- PARITY → denotes number of pregnancies completed to delivery during the viable period → not increased for multiple births or decreased from stillbirths
- Duration of normal pregnancy is 40 weeks
- By convention → gestational age is calculated from first day of LMP
- Ovulation normally occurs around day 14.
 - After ovulation, oocyte remains capable of being successfully fertilised for up to 12 hours and fertilisation usually takes place in the ampulla of the oviduct
 - By 6 days after fertilisation, it enters the uterine cavity and implants in the endometrium
- Weeks 2-8 are the embryonic period, week 9 is the start of the foetal period
- Pregnancy is divided into three trimesters of ~14 weeks each
- A pregnancy is considered TERM if it makes it to 37 weeks

PHYSIOLOGICAL CHANGES IN PREGNANCY:

Table 103-1 Key Physiologic Changes in Pregnancy	
System	Physiologic Changes
Cardiovascular	Increased circulating blood volume, cardiac output, in resting heart rate
	Decreased systemic vascular resistance and blood pressure
Respiratory	Increased in tidal volume
	Decreased functional residual capacity
GI	Delayed gastric emptying, decreased intestinal motility, and decreased lower esophageal sphincter
Urinary	Increased in kidney size, renal blood flow, and glomerular filtration rate
	Dilatation of ureteral and renal calyces or pelvis
Hematopoietic	Increased plasma volume and the number of erythrocytes → increased circulating blood volume
Endocrine	Altered metabolism
	Increased vascularity and mild hyperplasia of thyroid gland
Gynecologic	Increased uterine weight and intrauterine volume
	Increased uterine blood flow
	Increased nodularity and tenderness of breasts
	Increased nipple size, pigmentation, and skin striation

CARDIOVASCULAR SYSTEM:

- A 40% increase in circulating blood volume, 43% increase in cardiac output and 17% increase in resting HR are main changes in CVS in pregnancy
- SVR is 20% lower → BP decreases to a nadir in 2nd trimester before increasing again
- IVC compression is significant and left lateral position increases venous return in resuscitation of gravid patient
- Elevation of the diaphragm displaces the heart superiorly and to the left

RESPIRATORY SYSTEM:

- Many women experience dyspnoea during pregnancy
 - Hormone-induced 40% increased in TIDAL VOLUME AND ATTENDANT PCO₂ DECREASE (normal value in pregnancy is 30mmHg)
- FRC is decreased because of a rise in the level of the diaphragm

GI SYSTEM:

- Pregnancy-induced changes are due to BOTH:
 - Progressive displacement of the abdominal viscera
 - Hormone-mediated functional alterations
- Gastric reflux commonly occurs
- Hepatic enzymes are induced during pregnancy
- GB emptying is delayed and less efficient → hence and ↑d risk of gallstones

URINARY SYSTEM:

- Pregnancy-related renal changes include increases in kidney size, renal blood flow and GFR
- By the second trimester, the GFT may increase by 50% → hence urea and creatinine decreases
- Dilatation of ureteral and renal calyces due to ureteral compression frequently seen (R>L, because of sigmoid colon cushioning left ureter)

HAEMATOPOIETIC SYSTEM:

- During pregnancy, circulating blood volume expands by an average of 40-45% due to an increase in BOTH PLASMA VOLUME AND NUMBER OF ERYTHROCYTES
- Hb concentration DECREASES DUE TO DILUTIONAL INTRAVASCULAR VOLUME EXPANSION, but should not fall below 110
- Leukocyte count ↑s (up to 12), but beginning in 2nd trimester, leukocyte function is usually depressed → ↑d susceptibility to infection
 - Patients with autoimmune conditions may improve
- Circulating coagulation factors increase
- Platelet count may decrease slightly due to increased consumption

ENDOCRINE SYSTEM:

- Hyperinsulinaemia and fasting hypoglycaemia → altered response to glucose ingestion produces postprandial hyperglycaemia and ensures a sustained glucose supply to the foetus
- ↑ in size and vascularity of thyroid gland

UTERUS:

- Uterine weight and intrauterine volume increase during pregnancy from 70g to 1100g and from 10mL to 5000mL respectively
- By 12 weeks, the uterus becomes an intraabdominal organ
- There is a progressive increase in uterine blood flow to approximately 450-650mL/min

BREASTS:

- Many women note breast tenderness and tingling from early in first trimester
- Breasts enlarge and become more nodular

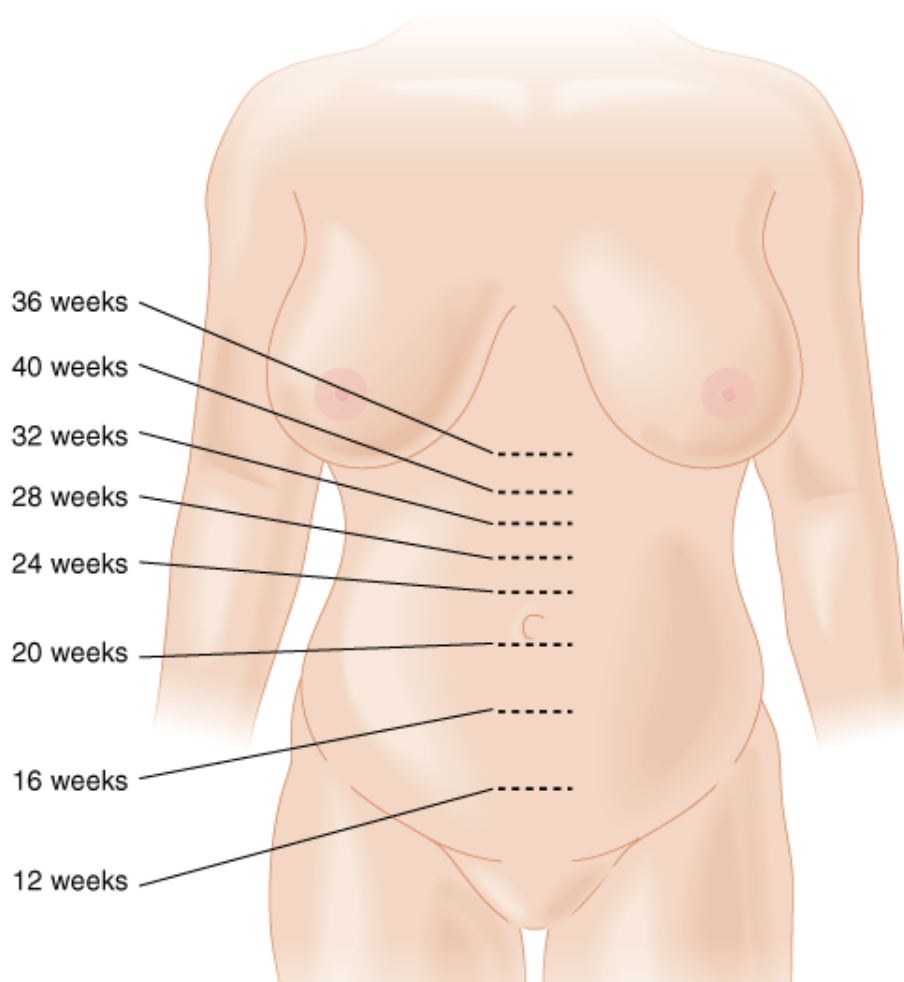
CLINICAL FEATURES:

HISTORY:

- **ABDOMINAL DISCOMFORT:**
 - DDX of abdominal pain varies with stage of gestation and must include all the possibilities in nonpregnant patients as well as those unique to pregnancy
 - Premature labour, abruption and uterine rupture are considered when abdominal pain occurs during late 2nd and 3rd trimester
 - Vascular congestion of pelvic tissue and round ligament tension cause lower abdominal discomfort early in pregnancy
 - Braxton-Hicks contractions are irregular, palpable contraction that may occur → especially in late pregnancy
 - Incidence of appendicitis is unchanged in pregnancy, but diagnosis is more difficult → appendix may be displaced upward and right ward resulting in odd locations of abdominal pain
 - Increased risk of cholelithiasis and cholecystitis in pregnancy
- **SYNCOPE:**
 - Many women experience palpitations, dizziness, near syncope and syncope during pregnancy
 - DDX – anaemia, electrolyte imbalance, dehydration, PE, arrhythmia → aetiology is often unclear

PHYSICAL EXAMINATION:

- Routine assessment of maternal wellbeing and evaluation of foetal status
 - Normal FHR ranges from 110-160/min
- By end of first trimester, the size of the uterus can be assessed by abdominal examination:



- From 20-32 weeks, the height of the fundus above the symphysis approximates the gestational age for a singleton pregnancy

DIAGNOSIS:

- A positive result on a pregnancy test, does not confirm a normal intrauterine pregnancy → ectopic, recent abortion, or HCG-secreting tumours (molar pregnancy) can also produce a positive result
- Failure of β -HCG to double every 1.4-2.0 days suggests an ectopic or nonviable pregnancy
- IMAGING:
 - US → earliest definitive sonographic finding is a gestational sac (can be detecting by transabdominal scan at 5.5-6 weeks gestation, 4-5 weeks by TV scanning)

DISPOSITION:

- SYMPTOMS THAT REQUIRE EVALUATION IN PREGNANCY ARE OUTLINED BELOW:

Table 103-2 Symptoms and Signs in Pregnancy that Need Prompt Evaluation

Change in fetal movement pattern
Fever, chills
Refractory emesis
Visual disturbance
Abdominal pain
Significant headache
Anasarca
Dysuria
Vaginal bleeding and fluid loss
Abnormal vaginal discharge

SPECIAL CONSIDERATIONS:

MEDICATION USE:

- ANALGESIC AGENTS:
 - Paracetamol is the agent of choice
 - Aspirin and NSAIDs may prolong gestation and labour through inhibition of cyclooxygenase and can cause premature closure of the ductus arteriosus and subsequent pulmonary hypertension. Use of NSAIDs is also associated with oligohydramnios, intestinal perforation, hydrops fetalis and renal failure
- GI AGENTS:
 - Metoclopramide and ondansetron are safe based on animal data
 - Most OTC antacids are ok in pregnancy
- COLD PREPARATIONS:
 - Most OTC cold agents contain sympathomimetic agents → vasoconstrictive properties and may lead to vascular-mediated congenital defects
- ANAESTHETICS:
 - Proper use of most agents for local or regional anaesthesia has not been associated with detrimental foetal effects

IMMUNISATIONS:

- Live-virus vaccines → MMR, poliomyelitis, varicella should be avoided in all trimesters as well as for 3 months prior to conception
- Inactivated (killed-virus) vaccines, including parenteral influenza vaccine, can be administered during pregnancy
- Tetanus toxoid alone or in combination with diphtheria toxoid can be given during pregnancy

NUTRITION AND NUTRITIONAL SUPPLEMENTATION:

- Good nutritional status before conception as well as during pregnancy is important for maternal and infant outcome
 - Calcium rich foods
 - Folic acid, iron, iodine supplementation recommended
- Caffeine → risk of miscarriage is increased with intake over 200-300mg/d, particularly in combination with cigarettes or alcohol or 800mg/d alone

TRAVEL:

- High-altitude stays of a few days' duration have not been associated with risk to the foetus, but exposure for longer duration increases the chance of foetal growth retardation, maternal high Bp and premature delivery