* To provide a suitable environment for the growth and development of the fetus.
* In part, to meet the metabolic demand brought on by the fetus, placenta, and uterus.
* In part, due to the ↑progesterone and oestrogen.
Progesterone remains increased throughout pregnancy (corpus luteum > placenta)

- Smooth muscle relaxation
- Raises body temperature
Endocrine changes

* Increased oestrogen
  * Breast, nipple growth
  * ↑uterine blood flow, myometrial growth
  * Cervical softening
  * ↑oxytocin receptors
  * ↑water retention
  * ↑TBG
Endocrine changes

* Human placental lactogen (promotes growth)
  * ↑ insulin secretion but

* ↓ insulin's peripheral effect (fatty acids and glucose diverted to the fetus)
Endocrine changes

- The pituitary gland (enlarges in size)
  - Prolactin $\uparrow$ (secondary to oestrogen stimulation)
  - ACTH $\uparrow$ but LH, FSH $\downarrow$
  - Cortisone output $\uparrow$ but the free levels normal
  - $\uparrow$ oxytocin first stage of labour and suckling
Endocrine changes

* Effect of pregnancy on the thyroid
  * enlarges (due to ↑ demand in pregnancy)
  * relative iodide deficiency (renal clearance)
  * Thyroid-binding globulin (TBG) is doubled (oestrogen)
* Total T3 and T4 rise but then normalises
* TSH may decrease but then normalises
Haemodynamic changes

* Plasma volume
  * Increases from 6 weeks
  * Rapid expansion 30-34 weeks
  * Up to 50% ↑ (extra 1500 mL)
Haemodynamic changes

- Red cell mass
  - ↑20%
  - Physiological anaemia
    (dilutional effect, second trimester)
- Mean corpuscular haemoglobin concentration: constant.
Haemodynamic changes

* White cell count ↑
  * Neutrophilia peaks at 32 weeks
  * Massive neutrophilia: during labour.
  * Lymphocyte function and cell-mediated immunity ↓↓↓↓
  * Eosinophils almost absent in delivery
Platelets \(\downarrow\) slightly

- Clotting factors \(\uparrow\), Fibrinogen \(\uparrow\uparrow\)
  - Pregnancy hypercoagulable state
Cardiovascular changes

- Cardiac output ↑ from 5 to 6.5 L/min
- Stroke vol ↑ by 10%
- pulse rate ↑ 15 beats/min
- Delivery output further increases
Peripheral resistance ↓ by 50%
BP ↓ in second trimester then ↑ to pre-pregnancy level
Uterine compression: supine hypotension syndrome
Renin-angiotensin system plays a critical part
Respiratory system changes

- Tidal volume ↑ by 40% (progesterone effect)
- Resting pregnant woman ↑ ventilation by breathing more deeply and not more frequently.
- Breathlessness common as pCO2mat is set lower to breath out fetal CO2
Changes in uterus

- 10 fold ↑ in weight and blood flow
- Cavity enlarges 1000 fold
- Muscle hypertrophy till 20wk the stretching
- Massive hypertrophy of uterine and ovarian vessels
Changes in cervix

- Reduction in cervical collagen (softens)
- Hypertrophy of cervical glands (discharge)
- Thick mucous plug: protective
Changes in vagina

* Venous congestion $\rightarrow$ bluish tint
* High oestrogen levels stimulate glycogen $\rightarrow$ more lactic acid, protective
Changes in breast

- Lactiferous ducts and alveoli develop (oestrogen, progesterone, prolactin)
- Colostrum is formed as early as 12 weeks
- Lactation
  - Sudden withdrawal of E+P → prolactin starts lactation
  - Suckling ↑ oxytocin → milk ejection
Changes in urinary tract

- Renal blood flow increases 50%
  - ↑GFR, several blood level decreases
- Kidney size ↑, dilatation of calyces and ureter
- Detrusor relaxation
- ↑vesicoureteric reflexes
Changes in alimentary system

- Smooth muscle relaxation (progesterone)
  - heartburn
  - constipation
  - problems in digestion
Changes in skin

- Pigmentation in linear nigra, areola, chloasma
- Palmar erythema
- Striae (stretch marks)
Changes in life...

Thank you