ULO 1: RELATE THE PRINCIPLES OF ANATOMY AND PHYSIOLOGY TO OPITOMISE PHYSIOLOGICAL BIRTH

NORMAL LABOUR

- Characterised by spontaneous onset and progression of labour
- Includes biological and psychological conditions that promote effective labour
- Results in the vaginal birth of the infant and placenta
- Results in physiological blood loss
- Facilitates optimal newborn transition through skin-to-skin contact and keeps the mother and infant together during the postpartum period
- Supports early initiation of breastfeeding

STAGES OF LABOUR

STAGE 1: the time from the onset of labour (uterine contractions are of sufficient frequency, intensity and duration to cause effacement and dilation of the cervix) to the time when there is complete dilatation of the cervix.

LATENT PHASE:

→ Time between the onset of contractions and when the cervix reaches approx. 3cm dilatation
→ Involves the effacement of the cervix → cervix shortens or "thins out" and is taken up into the lower segment of the uterus
→ Effacement and dilatation usually occur as separate events in the nulliparous woman but may occur simultaneously in a multiparous woman
→ Time frame is variable but is usually complete within 3-8 hours in a normal labour

ACTIVE PHASE:

→ The time from the end of the latent phase (3cm) to full dilatation (10cm) and is often referred to as "established labour"
→ It is accompanied by stronger, longer and more frequent uterine contractions
→ Time frame is variable but may range from 2-12 hours (time usually reducing with parity)

TRANSITION PHASE:

→ A transitional period between the period of cervical dilatation, and the time when active maternal pushing efforts begin
→ This is typically characterised by maternal restlessness, discomfort, desire for pain relief, a sense that the process is never ending, and demands to care attendants to end the whole process
→ The woman needs encouragement and support at this time

STAGE 2: starts at the time of complete dilatation of the cervix and ends with expulsion of the baby
→ Upper duration considered to be 2 hours in a nulliparous woman and 1 hour in a multiparous woman

STAGE 3: refers to the time from the birth of the baby to expulsion of the placenta and membranes
→ Involves the placenta separating from the uterine wall and being expelled from the birth canal
→ May be managed actively or physiologically
→ Time frame varies depending on management (normally a few minutes to 1 hour)
→ Tends to be more rapid if managed actively

STAGE 4: the first hour or two after birth when uterine tone is established and recovery from labour begins
→ First hour after birth
→ Skin-to-skin contact
→ Extremely important time for infant and mother
→ May include initiation of breastfeeding, mother-baby bonding, careful assessment of blood loss, repair of perineal trauma

HORMONES RELATED TO LABOUR

Endorphins

- Endorphins are neurotransmitters (opiate peptides – naturally occurring opiates) that are produced in response to certain stimuli (e.g. stress, fear or pain) → similar properties to pethidine, morphine and fentanyl
- They interact mainly with receptors in cells found in regions of the brain responsible for blocking pain and controlling emotion
- Act on opiate receptors in the brain
- Can be stimulated by light massage and touch
- Reduces the effects of stress and induces feelings of pleasure, euphoria and dependency
- After birth: elevated levels reward and reinforce mother-baby interactions including physical contact and breastfeeding

Oestrogen

- Produced by the placenta during pregnancy to help maintain a healthy pregnancy
- Levels increase in labour
- Increases number of oxytocin receptors on uterine muscle fibres
- Cause the release of prostaglandins → stimulates cervical ripening + initiates labour

Progesterone

- Produced by the ovaries and by the placenta
- Stimulates the thickening of the uterine lining in anticipation of implantation of a fertilized egg
- Sustains the pregnancy
- Synthesis of progesterone by the placenta is inhibited so that the uterus can contract (progesterone inhibits contractions during pregnancy)

Oxytocin

- Associated with feelings of bonding and motherhood
- Levels rise at the onset of labour, causing regular uterine contractions (uterotonic)
- Made in the hypothalamus → released from the posterior pituitary into the bloodstream
- Oxytocin-induced contractions become stronger and more frequent without the influence of progesterone and oestrogen
- Stimulates ripening of the cervix leading to dilatation during labour
- Causes the release of prostaglandins (help in ripening of the cervix)
- Baby's descending head stimulates stretch receptors in the lower vagina → triggers oxytocin release from the pituitary → causes more contractions that promote fetal descent (positive feedback loop – Ferguson reflex)
- After birth: skin-to-skin and eye-to-eye contact between mother and baby optimises oxytocin release (keeps uterus well contracted → prevents haemorrhage)
- During breastfeeding: assists with milk ejection

KEY TERMS:

Contractions: the periodic tightening and relaxing of the uterine muscle → triggered by oxytocin

Fundal Dominance: uterine contractions commence in the fundus and spread across and downwards → contraction lasts longest in the fundus (also most intense)

Engagement: the entrance of the largest diameter of the fetal head into the smallest diameter of the maternal pelvis (when the bi-parietal diameter passes through the pelvic brim) → measured in "fifths above the brim"

Uterine Retraction: muscle fibres retain some of the shortening of contraction instead of becoming completely relaxed → assists in the progressive expulsion of the fetus (upper segment of uterus becomes gradually shorter and thicker and its cavity diminishes)