Normal and Abnormal Labor

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Events of labor

- Contractions
- Effacement and dilatation of cervix
  - latent and active phase
- Rupture of membranes
  - artificial or natural
- Second stage descent
- Delivery
  - spontaneous or assisted
  - delivery of placenta
  - inspection of birth canal

37 to 42 weeks

- Oxytocin receptors increasing
- Myometrial sensitivity increasing
- Premature labor 11% (8% 30 years ago)
  - PPROM
  - chorio
  - multiple gestation
  - medical complications
  - too young or too old (>35 or <18)
- Post dates 4%
  - oligo - placental senescence
  - meconium – when you gotta go.....

Normal Labor

- 259 to 294 days after first day of LMP
- Fetus longitudinal, head flexed and down
- Contraction frequency and intensity build
- Slow dilatation to 4cm then faster
- Descent and rotation through pelvis
- Head delivers by extension
- Shoulders guided under pubis
- Body expelled under control

Presentation, Position, Lie

- Presentation
  - cephalic (96%), breech (3.5%), shoulder (.4%),
    hand, face/brow (.3%), funic
- Position
  - occiput anterior, occiput posterior (10%), occiput
    transverse (transient?), mentum, sacrum, frontum, etc
- Lie
  - longitudinal, transverse, oblique
- Cephalic
- Longitudinal
- Flexed

Shoulder or arm presentation

Occiput presentation

Brow Presentation
**Uterine contractions**

- Resting tone 10-15 mmhg
- Regular vs irregular contractions
  - Braxton-Hicks
    - regular or irregular 20-30 seconds
  - early labor
    - regular, closing interval, 45-60 seconds
- Montevideo units
  - aggregate of amplitude above baseline in 10 minute window
  - normal 90-390 Montevideo units
**Effacement**

- **Effacement**
  - third trimester to early labor
  - shortening of endocervical canal
  - cervix drawn up to become lower uterine segment
  - an inside-out process
    - 35mm length at 28 weeks
    - paper thin when complete
    - the internal os approaches the external os
  - best defined in primagravida

**Dilatation**

- **Dilatation**
  - begins late third trimester
  - complete at approximately 10cm

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**Primagravida**

1

Multigravida

2

**Primagravida**

3

Multigravida

4

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**Fully effaced and dilated cervix has in part actually become the lower segment of the uterus**

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**Station relative to ischial spines**

Through 1989 + or – 1-3 out of 3 thirds of total distance
After 1989 + or – 1-5 out of 5 cm above or below spines
Stages and phases

- First stage 6-10 hrs
  - latent phase 3-8 hrs
    • acceleration phase?
  - active phase 1-2 hrs
    • deceleration phase?
- Second stage 0-3 hrs
- Third stage 0-30 min
- Fourth stage? 1-2 hrs

Cardinal movements

- Flexion fetal head on neck
- Descent through pelvis
- Engagement BPD through inlet
- Internal rotation head vs levator sling
- Extension head under pubis
- External rotation head follows shoulders
- Expulsion body delivered
Cardinal Movements

- **Flexion**
  - flexion of the head on the body is the natural result of the pressure of contractions pushing the fetus down against resistance.

- **Descent**
  - the natural result of pressure on the fetus

- **Engagement**
  - when the BPD has passed the plane of the inlet; often assumed when the presenting edge of the fetal head has reached the ischia spines

- **Internal rotation**
  - descent of the head against the levator sling naturally aligns the head to an A-P orientation

- **Extension**
  - in case of the typical OA position, the occiput naturally follows road of least resistance and extends under symphasis pubis

- **External rotation**
  - once delivered, head realigns with shoulders that then rotate to A-P alignment and head follows

- **Expulsion**
  - delivery of body
  - shoulders
    - facilitate anterior delivery under pubis
    - lift posterior over perineal body
  - goals during expulsion
    - keep spine flexed
    - keep head down
    - maintain control of infant
  - maintain infant at level of mother and clamp and cut cord in timely fashion

The natural path for descent and delivery follows an arc through the pelvis.
After delivery, the head reassumes its normal alignment with shoulders that then follow their own internal rotation with the head following.

Pressure down more than traction out makes room.

Suprapubic pressure can help.

Arrest and protraction disorders

- Prolonged Latent phase  
  - 14 hours multigravida; 20 hours primagravida

- Arrest disorder  
  - 2 hours active phase with no further dilatation  
  - 1 hour second stage with no descent

- Protraction disorder  
  - primagravida active phase <1.2 cm/ hour  
  - multigravida active phase < 1.5 cm/ hour
Response to Abnormal labor

- Assessment
  - quality of labor
  - size of infant
  - size of pelvis

- Interventions
  - time
  - augmentation
  - assisted vaginal delivery
  - cesarean delivery

Interventions

- Augmentation
  - if labor insufficient
  - if infant not excessive size
  - only if pelvis clinically adequate

- Assisted vaginal delivery
  - if criteria met
  - if considered possible

- Cesarean delivery
  - if above criteria not met
  - if fetal surveillance non reassuring

Augmentation of labor

- Oxytocin
  - nona-peptide
  - released from posterior pituitary
  - stimulates uterine contractions
  - oxytocin receptors increase near term
  - synthetic version for induction/augmentation
  - at high doses is anti-diuretic
  - danger of over stimulation
    - fetal ischemia
    - uterine rupture

Augmentation

- Fetal surveillance reassuring
- Labor pattern suboptimal
- Start with low dose
- Continuous internal monitoring
- Increase slowly in small increments
- Hold at dose with \( \leq 200 \text{ MVU's} \)

Assisted vaginal delivery

- Forceps (same for vacuum)
  - high: fetal head unengaged
  - mid: head above +2 out of 5
  - low: +2 out of five or more
  - outlet:
    - head on perineum
    - scalp visible between contractions
    - sagittal suture within 45 degrees of A-P
- Must meet same criteria for vacuum
  - never use a vacuum where you wouldn’t use forceps
### Requirements for assisted vaginal delivery

- Fully dilated
- Membranes ruptured
- Position known
- Engaged
- Adequate pain relief
- Adequate pelvis
- Risk of shoulder dystocia acceptable

### Post partum inspection

- **Perineum**
  - lacerations
    - $1^\circ$ skin/mucosa/subcu but not fascia
    - $2^\circ$ all of above plus fascia but not sphincter
    - $3^\circ$ all plus sphincter
    - $4^\circ$ all plus rectal mucosa
    - Repair anatomically

- **Vagina**

- **Cervix**