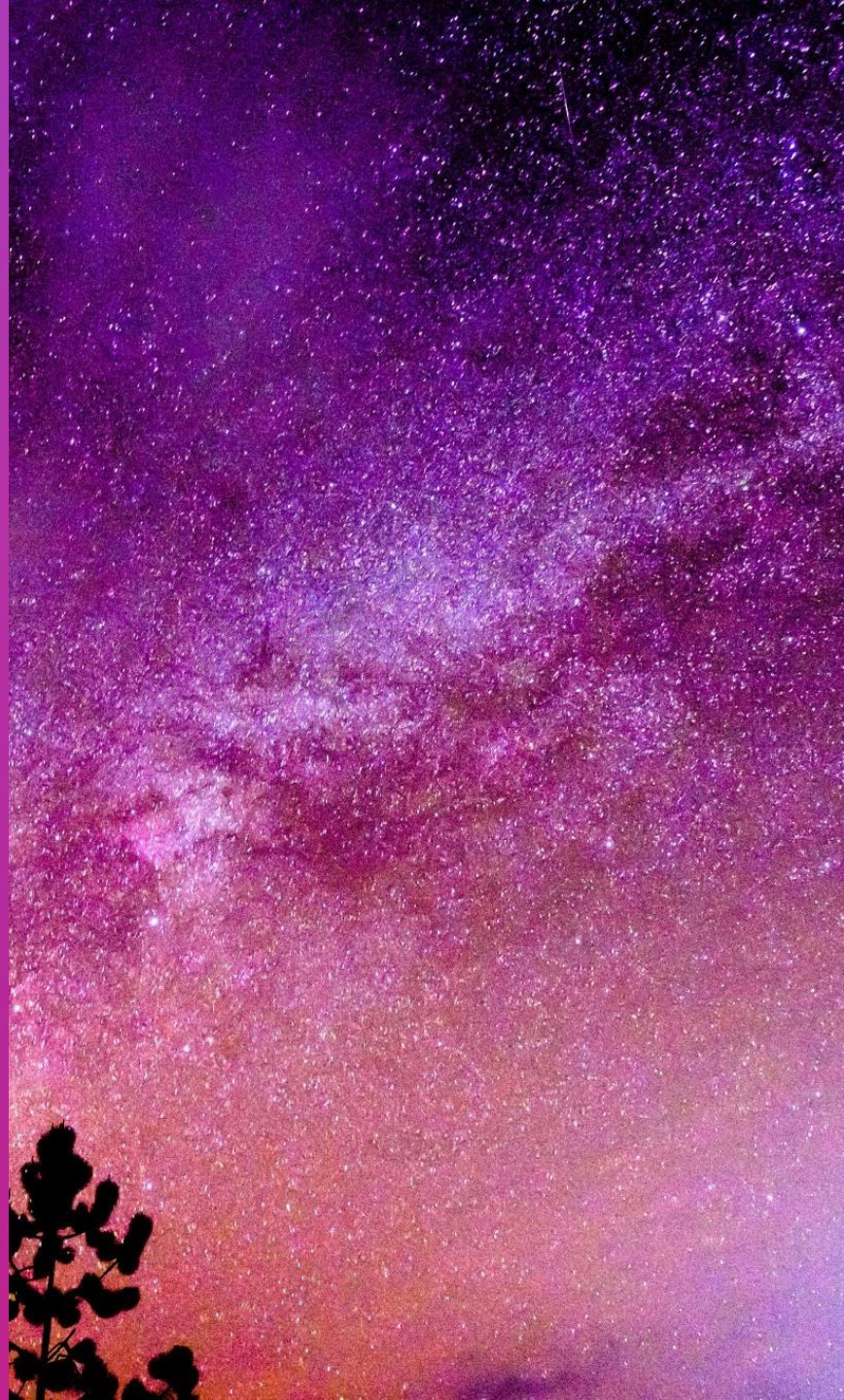
ASSOCIATION OF
PHYSICIAN ASSOCIATES IN
OBSTETRICS & GYNECOLOGY

THE BIRTHING PROCESS

MELISSA AMADA RODRIGUEZ, DMSC, PA-C

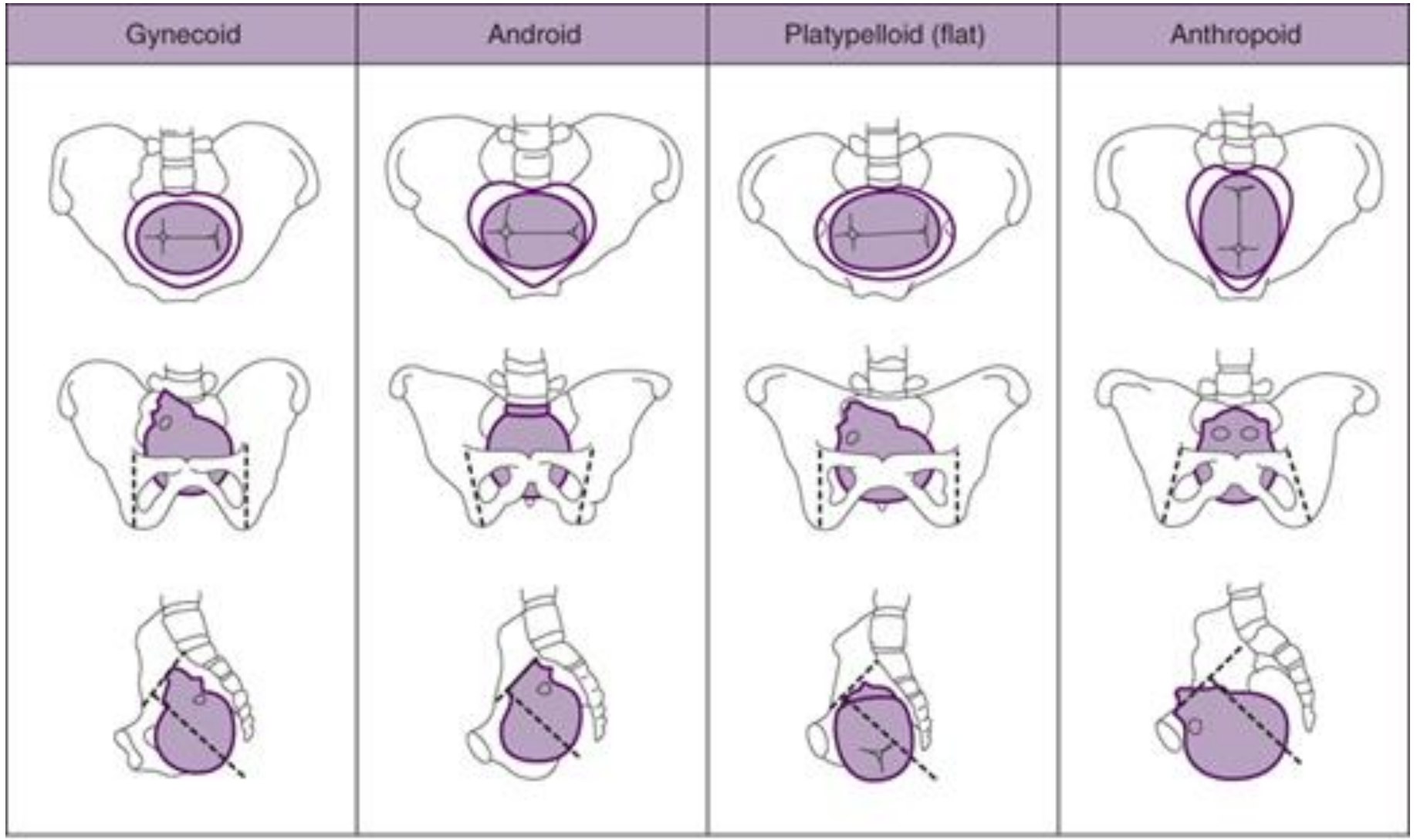


S U M M A R Y

- We were born for this, right? Well, other than pain, most people generally know very little about the process. Let’s review the physiology of pregnancy and its contributions to the birthing process, including critical hormones and adaptations. A dive in the past shows us prehistorical and ancient depictions of laboring women surrounded by supporting women. We aim to understand this connection, the advancement of maternal care, and tips and tricks for the best experience. We will also review deliveries in low-resource settings.

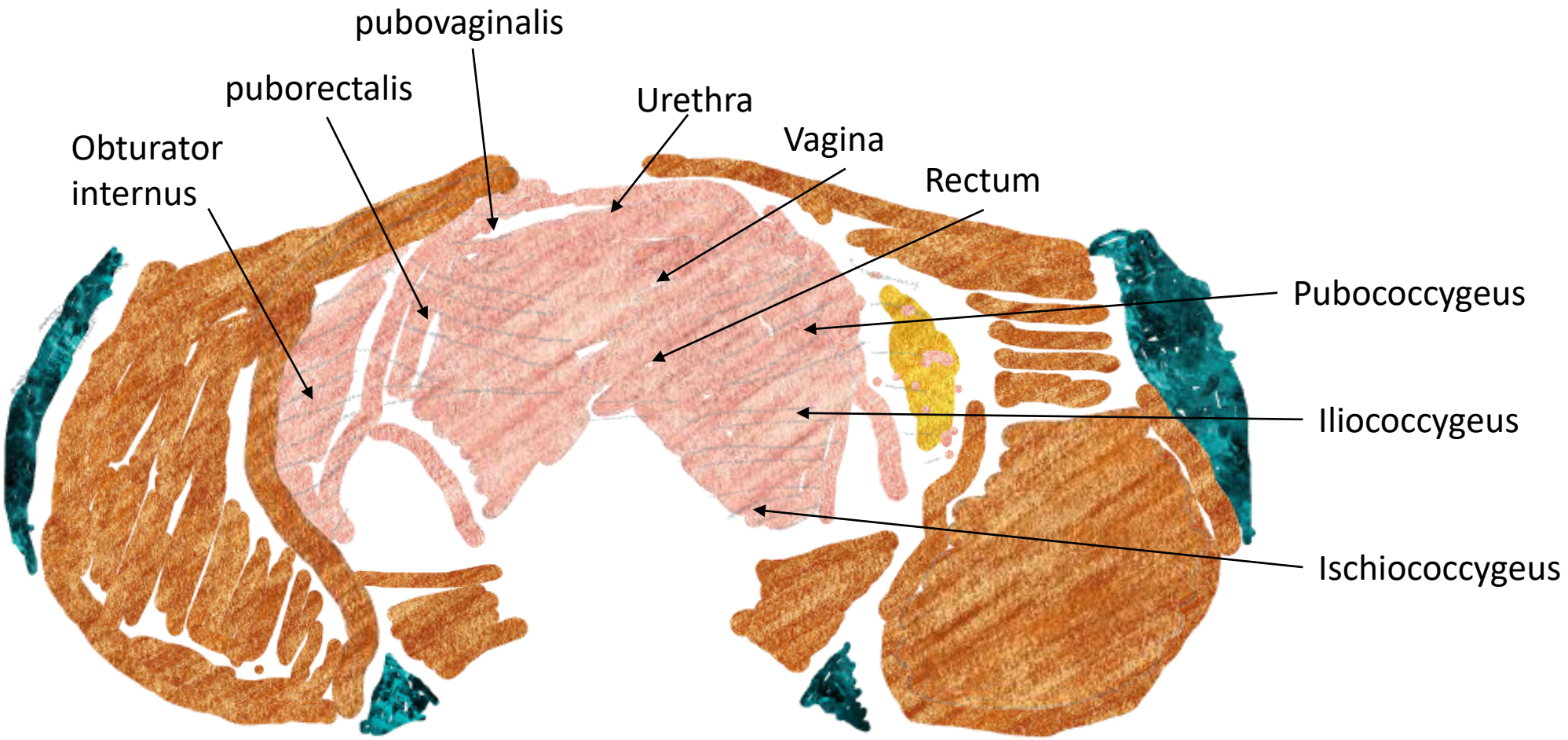
THE PELVIS

PELVIS

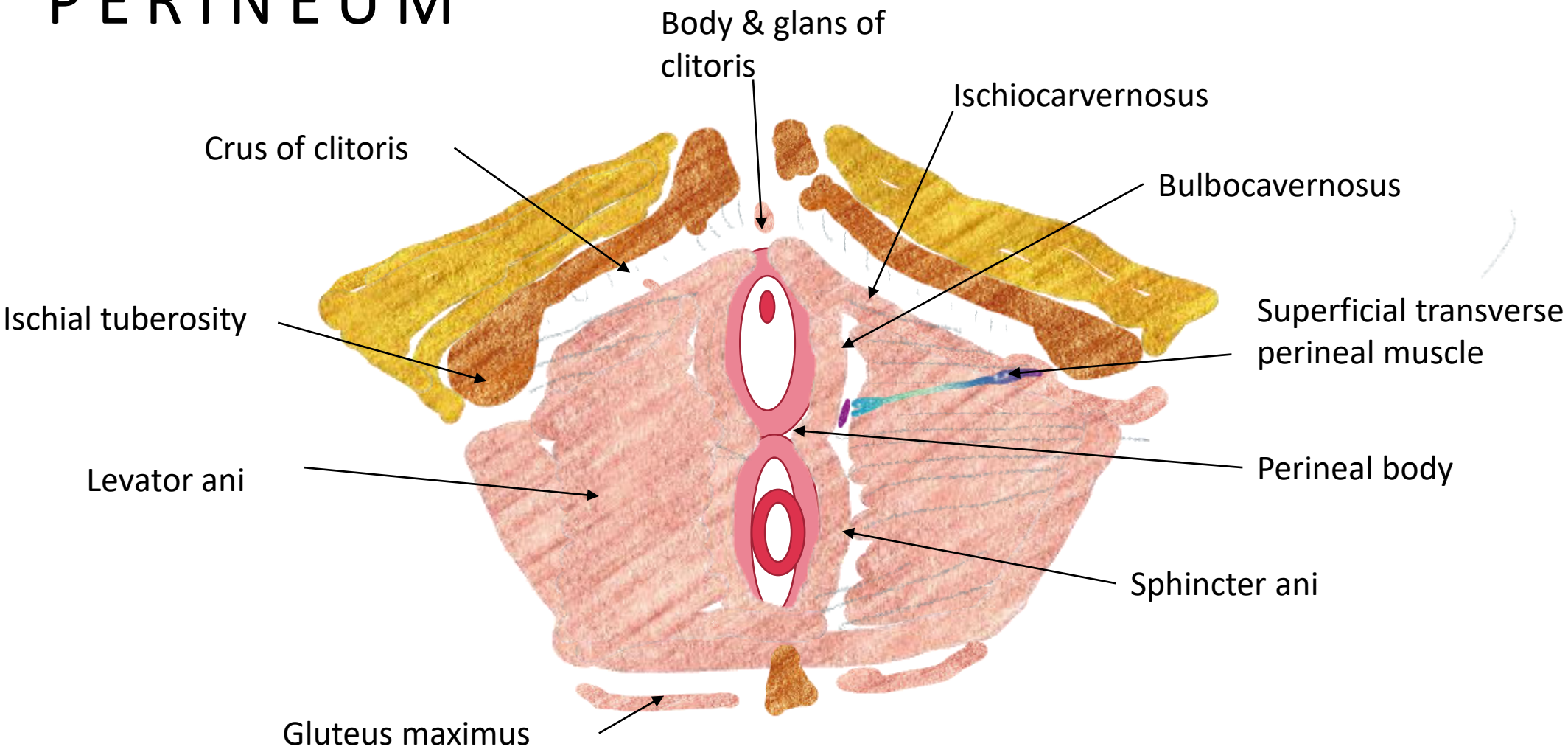


Source: A.H. DeCherney, L.Nathan, N.Laufer, A. S. Roman: CURRENT Diagnosis & Treatment: Obstetrics & Gynecology, Twelfth Edition

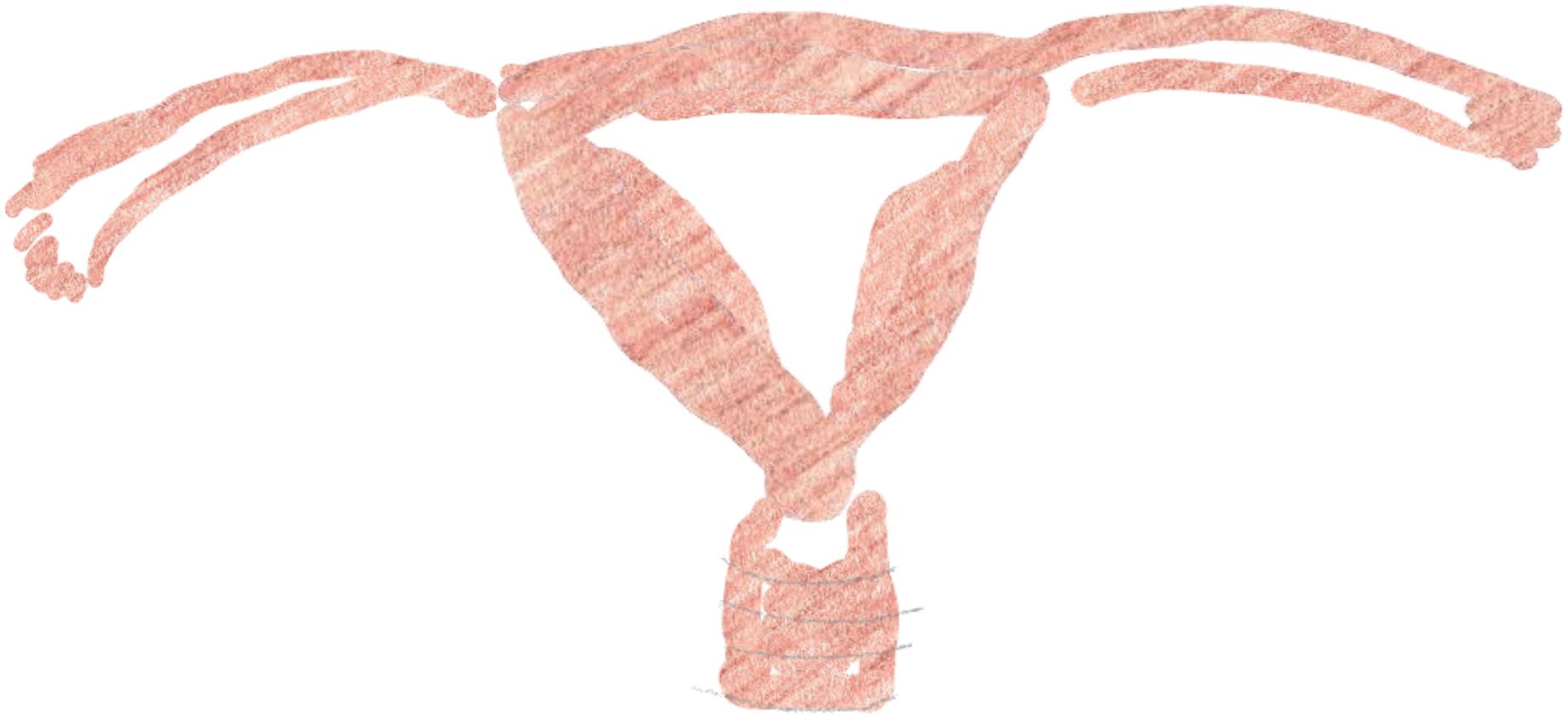
PELVIC FLOOR



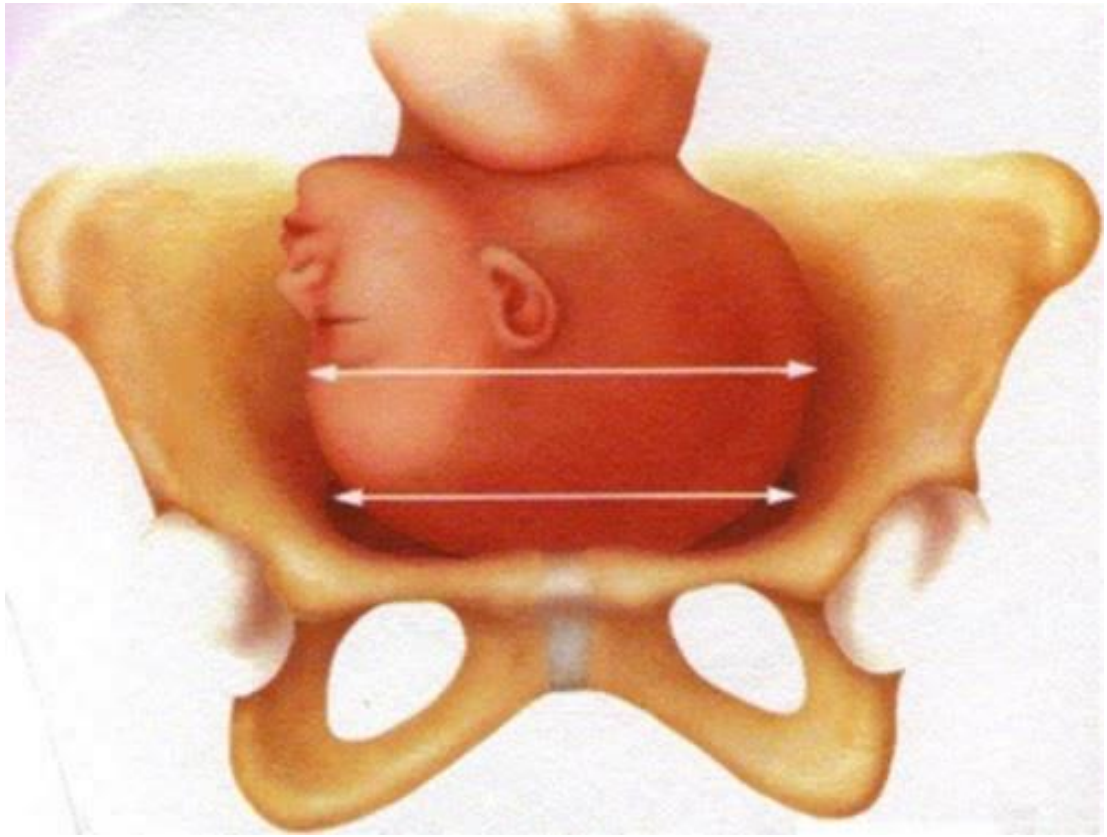
P E R I N E U M

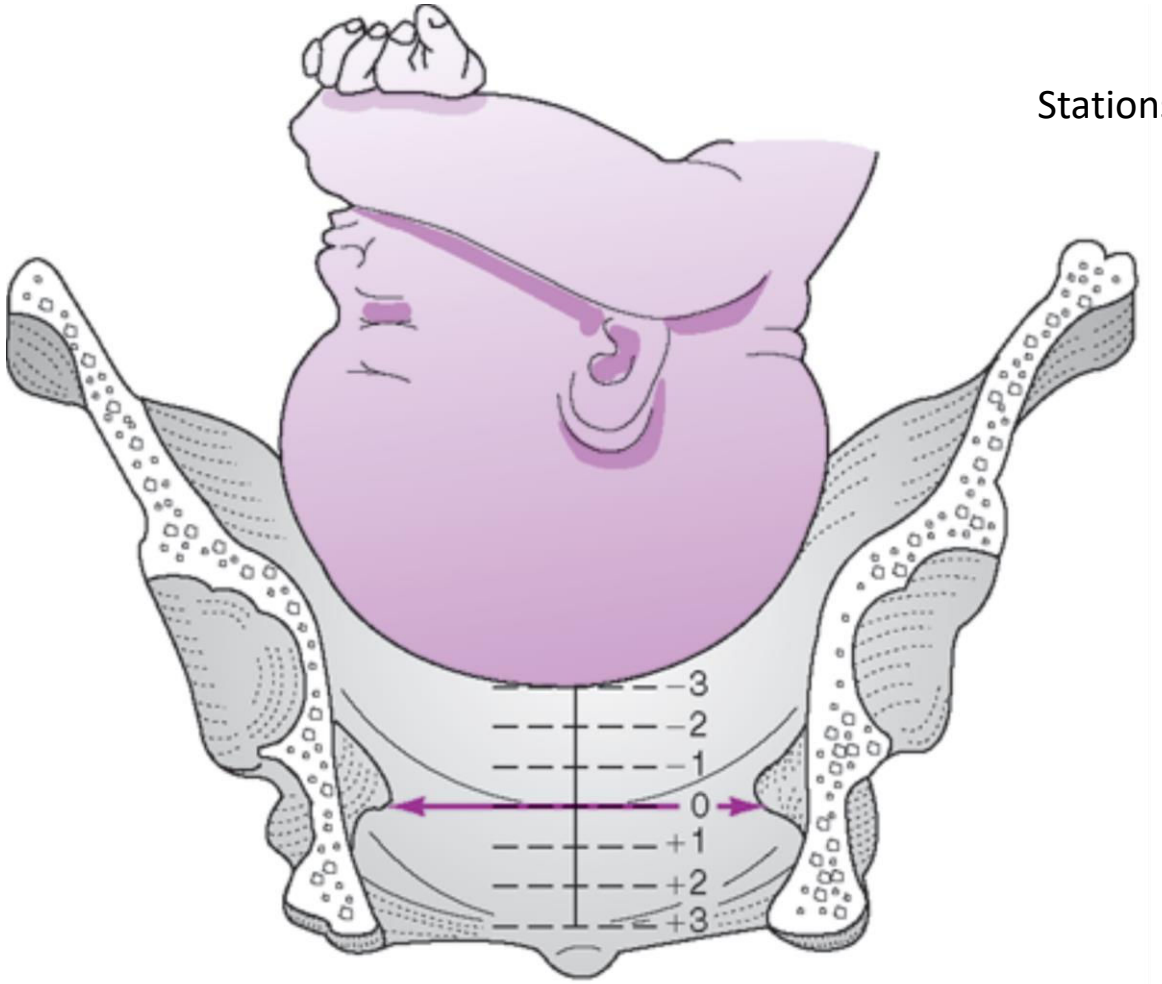

Body & glans of clitoris
Ischiocarvernosus
Crus of clitoris
Bulbocavernosus
Ischial tuberosity
Superficial transverse perineal muscle
Levator ani
Perineal body
Sphincter ani
Gluteus maximus

U T E R U S



THE OBSTETRIC PELVIS





Source: DeCherney AH, Nathan L, Laufer N, Roman AS: *CURRENT Diagnosis & Treatment: Obstetrics & Gynecology,* 11th Edition: www.accessmedicine.com

Stations of the fetal head.

(Reproduced, with permission, from Benson RC. Handbook of Obstetrics & Gynecology. 8th ed. Los Altos, CA: Lange; 1983.)

THE FETUS

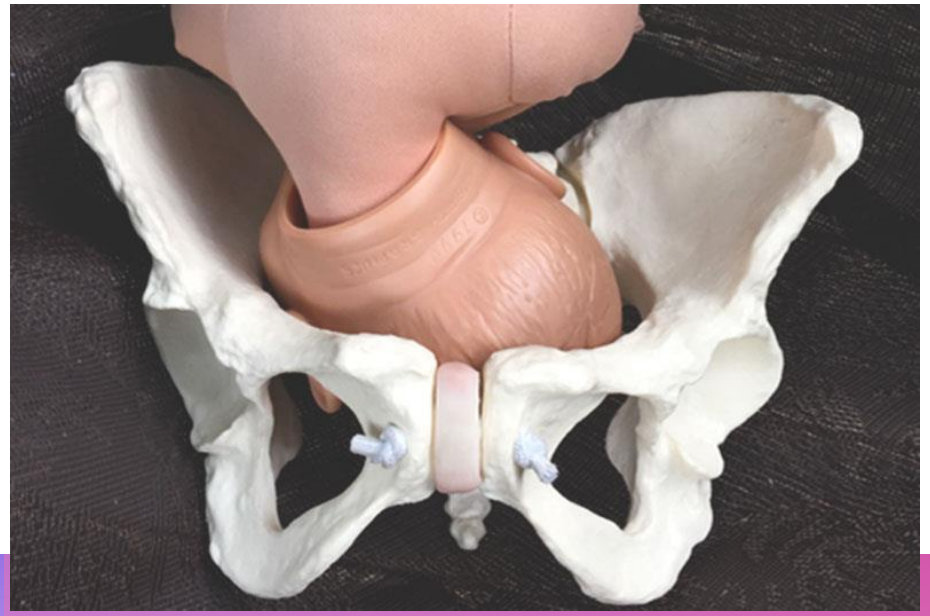
- Lie: long axis
- Presentation: cephalic, breech, and shoulder
- Presenting part
- Attitude: flexion, extension
- Position: anterior, posterior, transverse of the occiput, sacrum, mentum, frontal

E N G A G E M E N T

- Occurs when the presenting part of the widest diameter of the presenting part has passed through the inlet
  - Cephalic: biparietal
  - Breech: intertrochanteric
- On exam, the presenting part is at the ischial spines

SYNCLITISM VS ASYNCLITISM

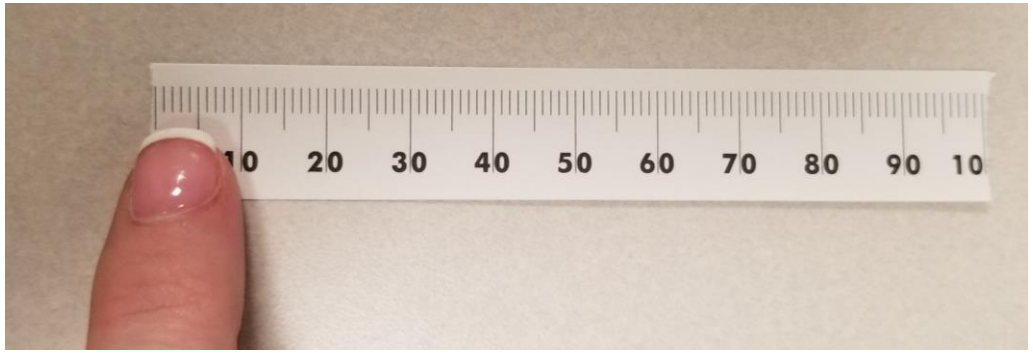
- Synclitism occurs when the biparietal diameter of the fetal head is parallel to the planes of the pelvis
    - Occurs when the uterus is perpendicular to the inlet and the pelvis is roomy
- Asynclitism occurs when the the fetal head is not parallel to the pelvis planes

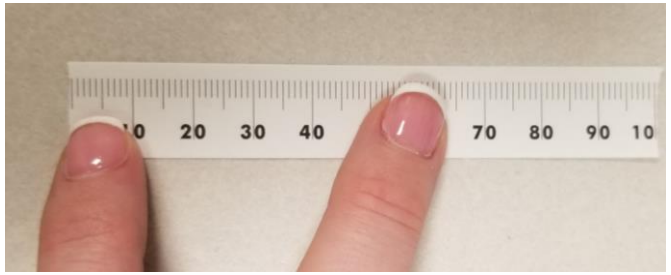


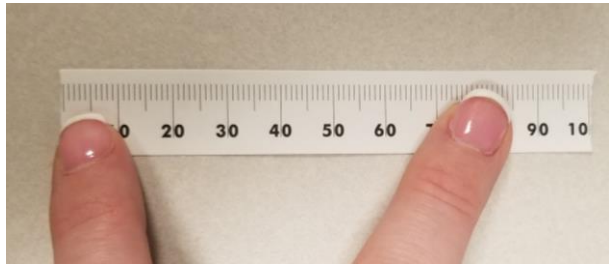
STAGES OF LABOR

- First is 0-10 cm
    - Further subdivided into LATENT and ACTIVE
- Second is 10cm to delivery
- Third is delivery of fetus until delivery of placenta
- Fourth stage is recovery

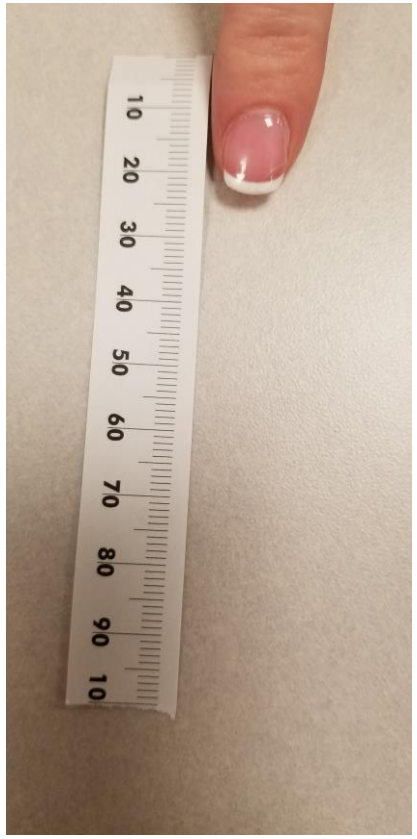
E X A M





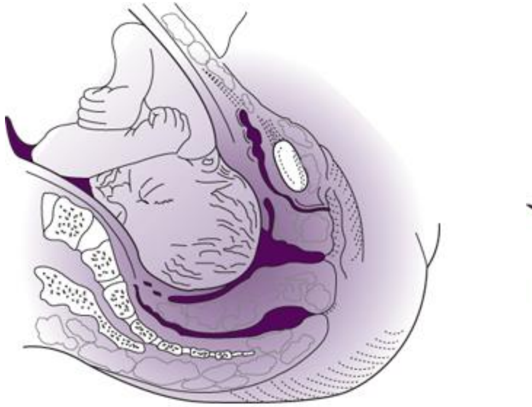


FROM 8-10 CM



CARDINAL MOVEMENTS

- Engagement
- Descent
- Flexion
- Internal rotation (OA, OP)
- Extension
- External rotation
- Expulsion



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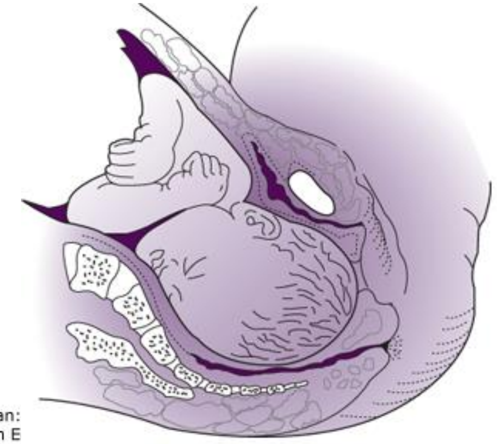

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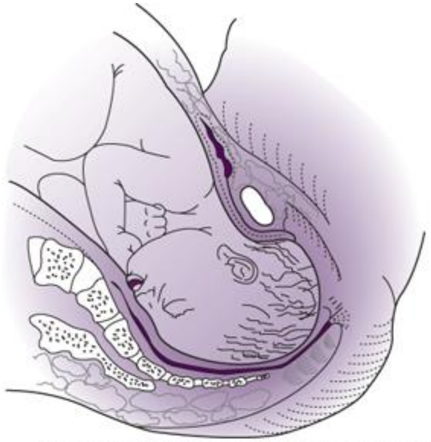

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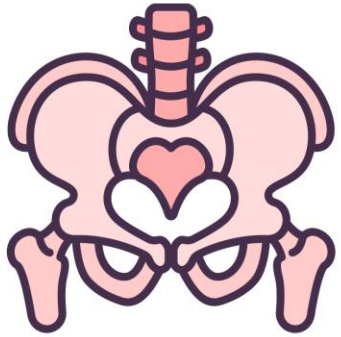
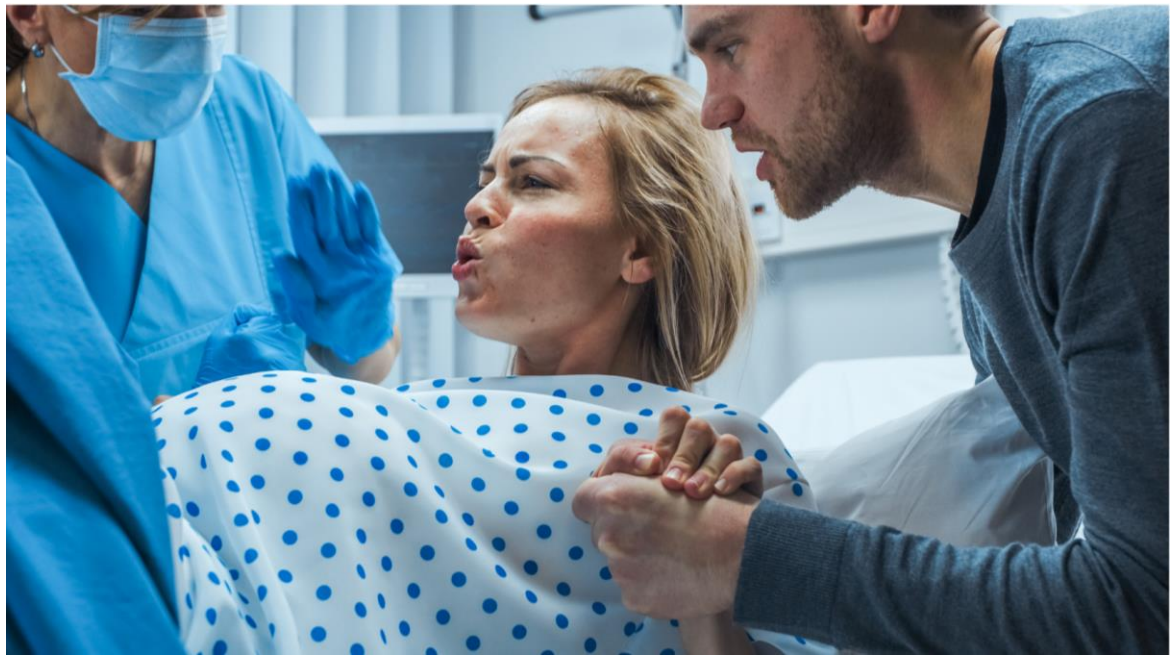
NATURAL COURSE



L A B O R



FETAL SURVEILLANCE

Table 1. Electronic Fetal Monitoring Definitions

Pattern	Definition
Baseline	• The mean FHR rounded to increments of 5 beats per minute during a 10-minute segment, excluding: —Periodic or episodic changes —Periods of marked FHR variability —Segments of baseline that differ by more than 25 beats per minute • The baseline must be for a minimum of 2 minutes in any 10-minute segment, or the baseline for that time period is indeterminate. In this case, one may refer to the prior 10-minute window for determination of baseline. • Normal FHR baseline: 110–160 beats per minute • Tachycardia: FHR baseline is greater than 160 beats per minute • Bradycardia: FHR baseline is less than 110 beats per minute
Baseline variability	• Fluctuations in the baseline FHR that are irregular in amplitude and frequency • Variability is visually quantitated as the amplitude of peak-to-trough in beats per minute. —Absent—amplitude range undetectable —Minimal—amplitude range detectable but 5 beats per minute or fewer —Moderate (normal)—amplitude range 6–25 beats per minute —Marked—amplitude range greater than 25 beats per minute
Acceleration	• A visually apparent abrupt increase (onset to peak in less than 30 seconds) in the FHR • At 32 weeks of gestation and beyond, an acceleration has a peak of 15 beats per minute or more above baseline, with a duration of 15 seconds or more but less than 2 minutes from onset to return. • Before 32 weeks of gestation, an acceleration has a peak of 10 beats per minute or more above baseline, with a duration of 10 seconds or more but less than 2 minutes from onset to return. • Prolonged acceleration lasts 2 minutes or more but less than 10 minutes in duration. • If an acceleration lasts 10 minutes or longer, it is a baseline change.
Early deceleration	• Visually apparent usually symmetrical gradual decrease and return of the FHR associated with a uterine contraction • A gradual FHR decrease is defined as from the onset to the FHR nadir of 30 seconds or more. • The decrease in FHR is calculated from the onset to the nadir of the deceleration. • The nadir of the deceleration occurs at the same time as the peak of the contraction. • In most cases the onset, nadir, and recovery of the deceleration are coincident with the beginning, peak, and ending of the contraction, respectively.
Late deceleration	• Visually apparent usually symmetrical gradual decrease and return of the FHR associated with a uterine contraction • A gradual FHR decrease is defined as from the onset to the FHR nadir of 30 seconds or more. • The decrease in FHR is calculated from the onset to the nadir of the deceleration. • The deceleration is delayed in timing, with the nadir of the deceleration occurring after the peak of the contraction. • In most cases, the onset, nadir, and recovery of the deceleration occur after the beginning, peak, and ending of the contraction, respectively.
Variable deceleration	• Visually apparent abrupt decrease in FHR • An abrupt FHR decrease is defined as from the onset of the deceleration to the beginning of the FHR nadir of less than 30 seconds. • The decrease in FHR is calculated from the onset to the nadir of the deceleration. • The decrease in FHR is 15 beats per minute or greater, lasting 15 seconds or greater, and less than 2 minutes in duration. • When variable decelerations are associated with uterine contractions, their onset, depth, and duration commonly vary with successive uterine contractions.
Prolonged deceleration	• Visually apparent decrease in the FHR below the baseline • Decrease in FHR from the baseline that is 15 beats per minute or more, lasting 2 minutes or more but less than 10 minutes in duration. • If a deceleration lasts 10 minutes or longer, it is a baseline change.
Sinusoidal pattern	• Visually apparent, smooth, sine wave-like undulating pattern in FHR baseline with a cycle frequency of 3–5 per minute which persists for 20 minutes or more.

FHR INTERPRETATION SYSTEM

Category I

- Category I FHR tracings include all of the following:
    - Baseline rate: 110-160 beats per minute
    - Baseline FHR variability: moderate
    - Late or variable decelerations: absent
    - Early decelerations: present or absent
    - Accelerations: present or absent

Category II

- Category II FHR tracings includes all FHR tracings not categorized as Category I or Category III. Category II tracings may represent an appreciable fraction of those encountered in clinical care. Examples of Category II FHR tracings include any of the following:
    - Baseline rate
        - Bradycardia not accompanied by absent baseline variability
        - Tachycardia
    - Baseline FHR variability
        - Minimal baseline variability
        - Absent baseline variability with no recurrent decelerations
        - Marked baseline variability
    - Accelerations
        - Absence of induced accelerations after fetal stimulation
    - Periodic or episodic decelerations
        - Recurrent variable decelerations accompanied by minimal or moderate baseline variability
        - Prolonged deceleration more than 2 minutes but less than 10 minutes
        - Recurrent late decelerations with moderate baseline variability
        - Variable decelerations with other characteristics such as slow return to baseline, overshoots, or “shoulders”

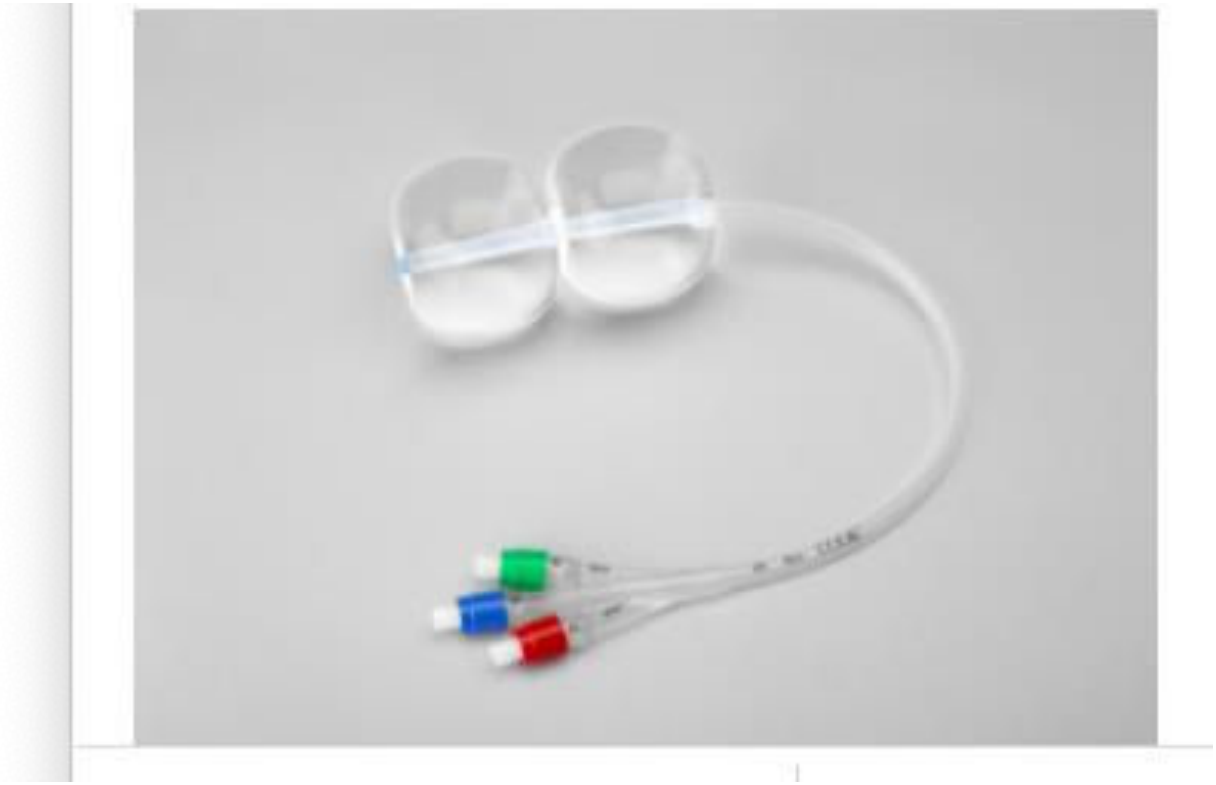
Category III

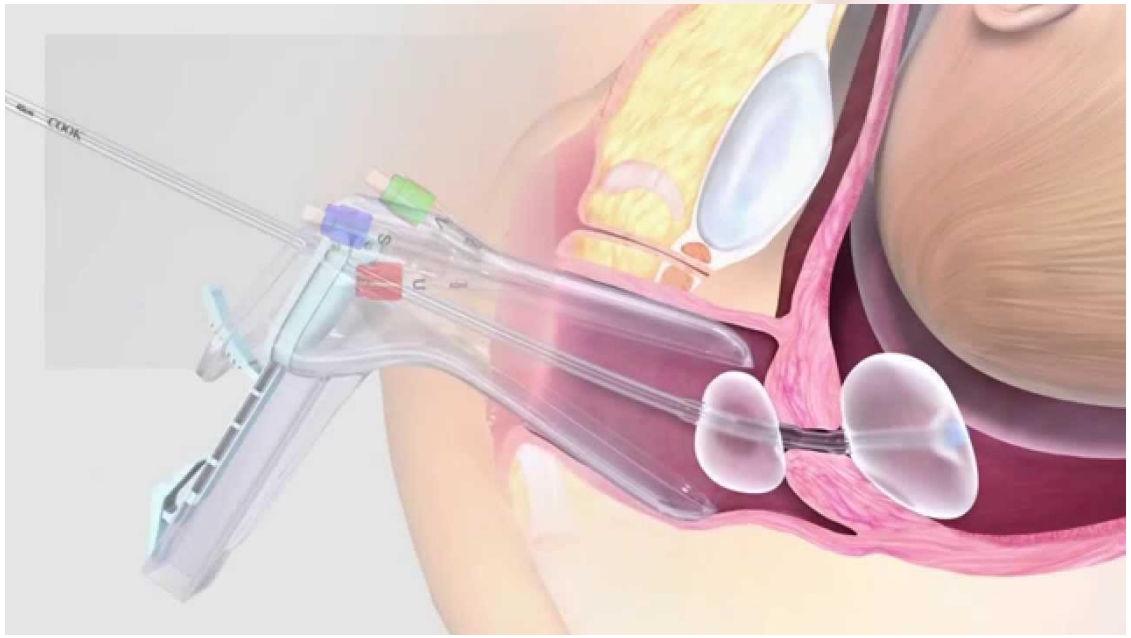
- Category III FHR tracings include either
    - Absent baseline FHR variability and any of the following:
    - Recurrent late decelerations
    - Recurrent variable decelerations
    - Bradycardia
    - Sinusoidal pattern

INDUCTION OF LABOR

- Cervical Ripening:
  - Misprostol (PGE1) (Cytotec)
  - Dinoprostone (PGE2) (cervidil)
  - Mechanical (foley, cook)
- Induction of labor:
  - Oxytocin
  - Amniotomy

- Women who undergo induction of labor have higher rates of cesarean delivery than those who experience spontaneous labor
- However, when compared to women who select expectant management, there is no difference in outcomes





D E L I V E R Y

Modified Ritgen maneuver: lift the fetal chin anteriorly, extend the fetal neck, other hand controls the occiput pace of expulsion

- Check for nuchal cord
- Deliver anterior shoulder with gentle traction (brachial plexus injury)

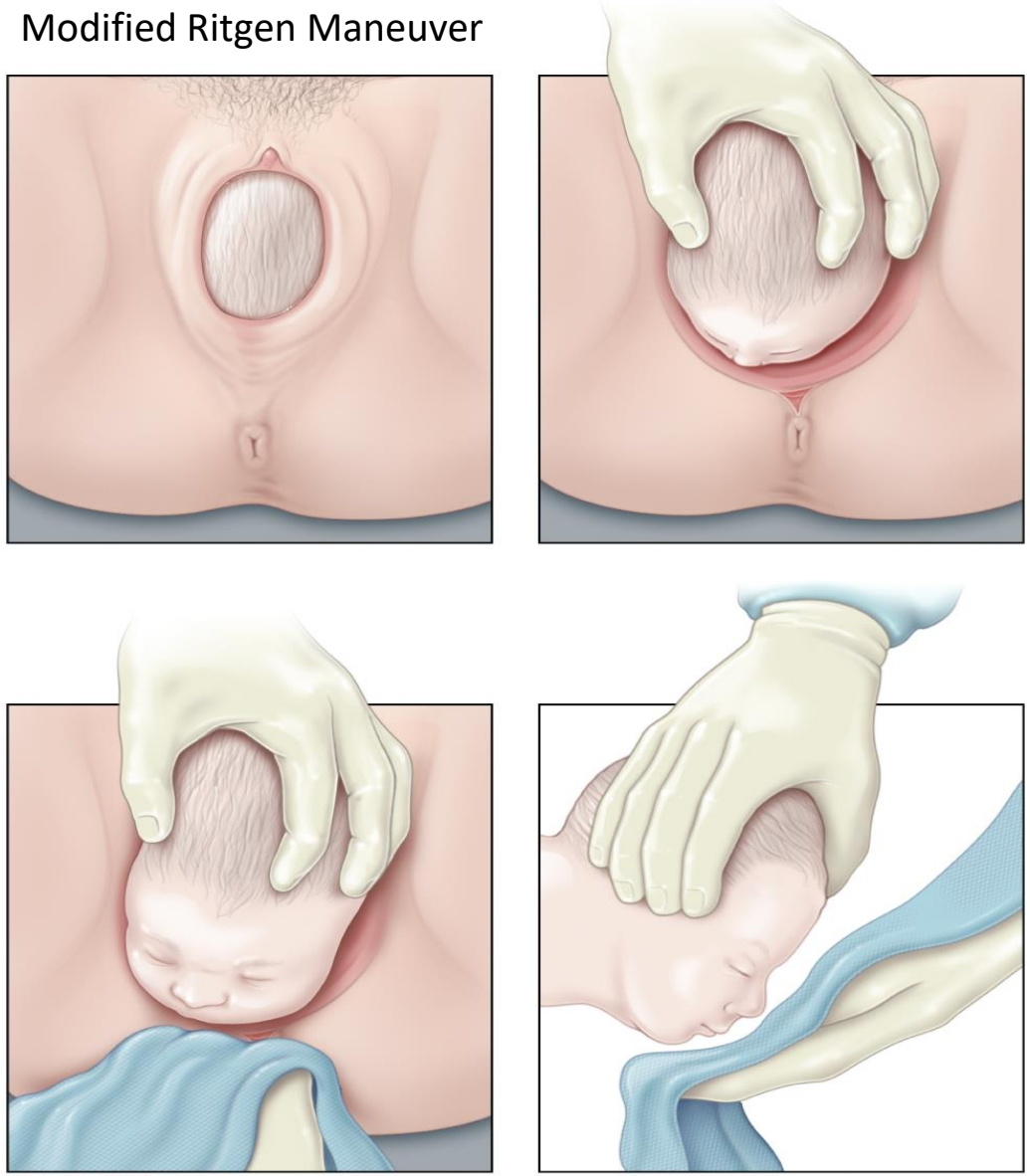
Evidence-based Practices:

- Delayed cord clamping
- skin to skin
- breastfeeding first latch within 1 hour of delivery

Placenta:

- Up to a 30-minute delay in delivery of placenta is normal
- Signs of placental separation are:
- Fresh show of blood
- Lengthening of umbilical cord
- Uterine fundus will elevate in the patient's abdomen
- Uterus becomes firm and globular

Modified Ritgen Maneuver



Acta Clin Croat. 2018 Mar; 57(1): 116–121. doi: 10.20471/acc.2018.57.01.14

PMCID: PMC6400357 | PMID: 30256019

Modified Ritgen Maneuver in Perineal Protection – Sixty-Year Experience

Dubravko Habek,[✉1] Ana Tikvica Luetić,[1] Ingrid Marton,[1] Matija Prka,[1] Goran Pavlović,[2] Željka Kuljak,[1] Deana Švanjug,[3] and Zdenka Mužina[2]

The Ritgen techni que is called modified when performing it during a contraction as opposed to in between contractions

Support techniques slow down the birth of the head, allowing the perineum to stretch slowly to reduce perineal trauma

Term, spontaneous labor with a fetus in vertex presentation with low maternal and fetal risks can be offered intermittent auscultation and nonpharmacologic analgesia

Delay admission to L&D if in the latent phase

Observation during the latent phase can include education and support, oral hydration, frequent position change, nonpharmacologic analgesia, and relaxation techniques

Encourage their preferred and most effective pushing technique

Delayed pushing has not been shown to significantly improve the likelihood of vaginal birth and the risks include infection, hemorrhage, and neonatal acidemia

CESAREAN SECTION

- ACOG Safe Prevention of the Primary Cesarean Delivery, Obstetric Care Consensus, Number 1, March 2014 (reaffirmed 2019)
- Terms: Nulliparous, Term, Singleton, Vertex (NTSV)
- Common indications: labor dystocia, abnormal or indeterminate FHR tracing, fetal malpresentation, multiple gestation, and suspected fetal macrosomia
- Maternal morbidities:
    - Hemorrhage requiring hysterectomy and transfusion
    - Uterine rupture
    - Anesthetic complications
    - Shock
    - Cardiac arrest
    - Acute renal failure
    - Assisted ventilation
    - Venous thromboembolism
    - Major infection
    - Would disruption or hematoma

Table 1. Risk of Adverse Maternal and Neonatal Outcomes by Mode of Delivery

Outcome	Risk	
Maternal	*Vaginal Delivery*	*Cesarean Delivery*
Overall severe morbidity and mortality*†	8.6%	9.2%*
	0.9%	2.7%†
Maternal mortality‡	3.6:100,000	13.3:100,000
Amniotic fluid embolism§	3.3–7.7:100,000	15.8:100,000
Third-degree or fourth-degree perineal laceration‖	1.0–3.0%	NA (scheduled delivery)
Placental abnormalities¶	Increased with prior cesarean delivery versus vaginal delivery, and risk continues to increase with each subsequent cesarean delivery.	
Urinary incontinence#	No difference between cesarean delivery and vaginal delivery at 2 years.	
Postpartum depression‖	No difference between cesarean delivery and vaginal delivery.	
Neonatal	*Vaginal Delivery*	*Cesarean Delivery*
Laceration**	NA	1.0–2.0%
Respiratory morbidity**	< 1.0%	1.0–4.0% (without labor)
Shoulder dystocia	1.0–2.0%	0%

Abbreviations: CI, confidence interval; NA, not available; NICU, neonatal intensive care unit; OR, odds ratio; RR, relative risk.

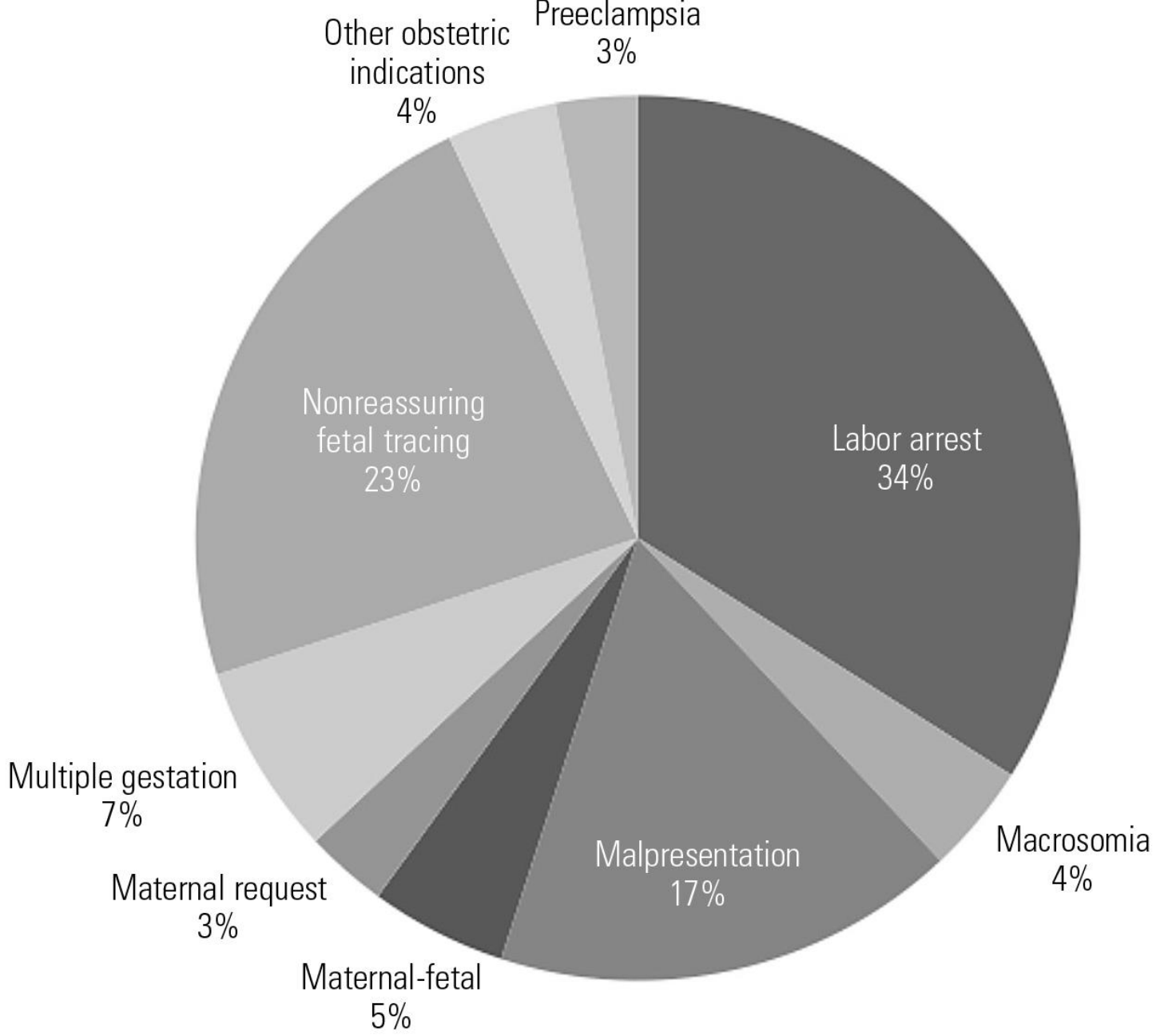


Fig. 3. Indications for primary cesarean delivery. (Data from Barber EL, Lundsberg LS, Belanger K, Pettker CM, Funai EF, Illuzzi JL. Indications contributing to the increasing cesarean delivery rate. Obstet Gynecol 2011;118:29–38.) ⇦

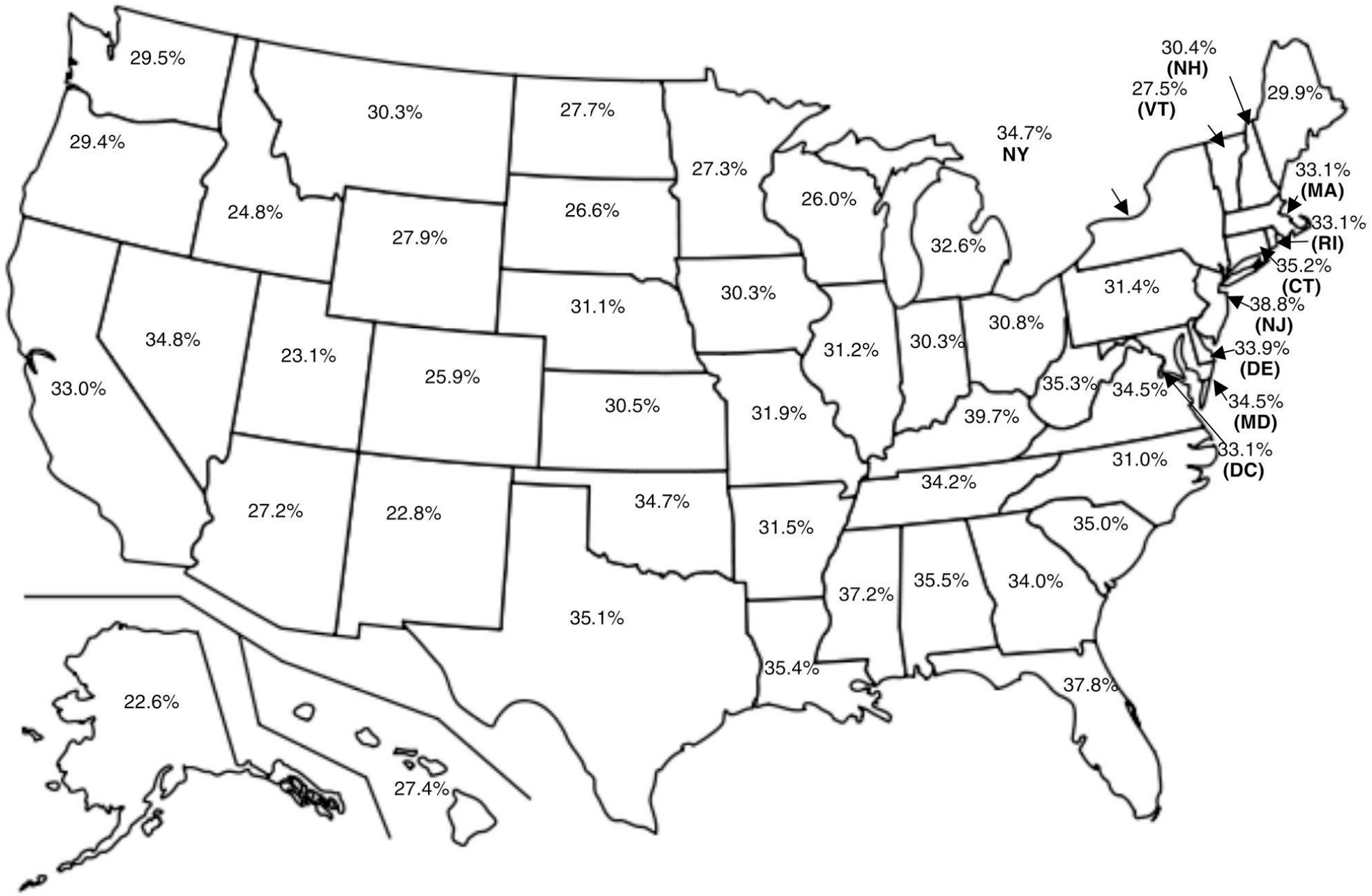


Fig. 2. U.S. total cesarean delivery rates by state, 2010. (Data from Martin JA, Hamilton BE, Ventura SJ, Osterman MJ, Mathews TJ. Births: final data for 2011. Natl Vital Stat Rep 2013;62(2):1–90.) ⇦

Table 2. Spontaneous Labor Progress Stratified by Cervical Dilation and Parity

	Median Elapsed Time (h)		
Cervical Dilation (cm)	*Parity 0 (95th percentile)*	*Parity 1 (95th percentile)*	*Parity 2 or Greater (95th percentile)*
3–4	1.8 (8.1)	—	—
4–5	1.3 (6.4)	1.4 (7.3)	1.4 (7.0)
5–6	0.8 (3.2)	0.8 (3.4)	0.8 (3.4)
6–7	0.6 (2.2)	0.5 (1.9)	0.5 (1.8)
7–8	0.5 (1.6)	0.4 (1.3)	0.4 (1.2)
8–9	0.5 (1.4)	0.3 (1.0)	0.3 (0.9)
9–10	0.5 (1.8)	0.3 (0.9)	0.3 (0.8)

Modified from Zhang J, Landy HJ, Branch DW, Burkman R, Haberman S, Gregory KD, et al. Contemporary patterns of spontaneous labor with normal neonatal outcomes. Consortium on Safe Labor. Obstet Gynecol 2010;116:1281–7.

Table 3. Recommendations for the Safe Prevention of the Primary Cesarean Delivery

Recommendations	Grade of Recommendati
First stage of labor	
A prolonged latent phase (eg, greater than 20 hours in nulliparous women and greater than 14 hours in multiparous women) should not be an indication for cesarean delivery.	1B Strong recommendation, moderate qu
Slow but progressive labor in the first stage of labor should not be an indication for cesarean delivery.	1B Strong recommendation, moderate qu
Cervical dilation of 6 cm should be considered the threshold for the active phase of most women in labor. Thus, before 6 cm of dilation is achieved, standards of active phase progress should not be applied.	1B Strong recommendation, moderate qu
Cesarean delivery for active phase arrest in the first stage of labor should be reserved for women at or beyond 6 cm of dilation with ruptured membranes who fail to progress despite 4 hours of adequate uterine activity, or at least 6 hours of oxytocin administration with inadequate uterine activity and no cervical change.	1B Strong recommendation, moderate qu
Second stage of labor	
A specific absolute maximum length of time spent in the second stage of labor beyond which all women should undergo operative delivery has not been identified.	1C Strong recommendation, low quali
Before diagnosing arrest of labor in the second stage, if the maternal and fetal conditions permit, allow for the following: • At least 2 hours of pushing in multiparous women (1B) • At least 3 hours of pushing in nulliparous women (1B) Longer durations may be appropriate on an individualized basis (eg, with the use of epidural analgesia or with fetal malposition) as long as progress is being documented. (1B)	1B Strong recommendation, moderate qu
Operative vaginal delivery in the second stage of labor by experienced and well trained physicians should be considered a safe, acceptable alternative to cesarean delivery. Training in, and ongoing maintenance of, practical skills related to operative vaginal delivery should be encouraged.	1B Strong recommendation, moderate qu
Manual rotation of the fetal occiput in the setting of fetal malposition in the second stage of labor is a reasonable intervention to consider before moving to operative vaginal delivery or cesarean delivery. In order to safely prevent cesarean deliveries in the setting of malposition, it is important to assess the fetal position in the second stage of labor, particularly in the setting of abnormal fetal descent.	1B Strong recommendation, moderate qu
Fetal heart rate monitoring	
Amnioinfusion for repetitive variable fetal heart rate decelerations may safely reduce the rate of cesarean delivery.	1A Strong recommendation, high quality evidence
Scalp stimulation can be used as a means of assessing fetal acid–base status when abnormal or indeterminate (formerly, nonreassuring) fetal heart patterns (eg, minimal variability) are present and is a safe alternative to cesarean delivery in this setting.	1C Strong recommendation, low quality evidence
Induction of labor	
Before 41 0/7 weeks of gestation, induction of labor generally should be performed based on maternal and fetal medical indications. Inductions at 41 0/7 weeks of gestation and beyond should be performed to reduce the risk of cesarean delivery and the risk of perinatal morbidity and mortality.	1A Strong recommendation, high quality evidence
Cervical ripening methods should be used when labor is induced in women with an unfavorable cervix.	1B Strong recommendation, moderate quality eviden
If the maternal and fetal status allow, cesarean deliveries for failed induction of labor in the latent phase can be avoided by allowing longer durations of the latent phase (up to 24 hours or longer) and requiring that oxytocin be administered for at least 12–18 hours after membrane rupture before deeming the induction a failure.	1B Strong recommendation, moderate quality eviden
Fetal malpresentation	
Fetal presentation should be assessed and documented beginning at 36 0/7 weeks of gestation to allow for external cephalic version to be offered.	1C Strong recommendation, low quality evidence
Suspected fetal macrosomia	
Cesarean delivery to avoid potential birth trauma should be limited to estimated fetal weights of at least 5,000 g in women without diabetes and at least 4,500 g in women with diabetes. The prevalence of birth weight of 5,000 g or more is rare, and patients should be counseled that estimates of fetal weight, particularly late in gestation, are imprecise.	2C Weak recommendation, low quality evidence
Excessive maternal weight gain	
Women should be counseled about the IOM maternal weight guidelines in an attempt to avoid excessive weight gain.	1B Strong recommendation, moderate quality eviden
Twin gestations	
Perinatal outcomes for twin gestations in which the first twin is in cephalic presentation are not improved by cesarean delivery. Thus, women with either cephalic/cephalic-presenting twins or cephalic/noncephalic presenting twins should be counseled to attempt vaginal delivery.	1B Strong recommendation, moderate quality eviden
Other	
Individuals, organizations, and governing bodies should work to ensure that research is conducted to provide a better knowledge base to guide decisions regarding cesarean delivery and to encourage policy changes that safely lower the rate of primary cesarean delivery.	1C Strong recommendation, low quality evidence

Abbreviation: IOM, Institute of Medicine.

LABOR DYSTOCIA

Definition of Arrest of Labor in the First Stage

- Spontaneous labor: More than or equal to 6 cm dilation with membrane rupture and one of the following:
- 4 hours or more of adequate contractions (eg, more than 200 Montevideo units)
- 6 hours or more of inadequate contractions and no cervical change

ABNORMAL SECOND STAGE OF LABOR

- Parity, delayed pushing, use of epidural analgesia, maternal body mass index, birth weight, occiput posterior position, and fetal station at complete dilation all have been shown to affect the length of the second stage of labor
- Document descent

OPERATIVE VAGINAL DELIVERY

- Outcomes of operative vaginal deliveries and unplanned cesarean deliveries shows no difference in serious neonatal morbidity (eg, intracerebral hemorrhage or death)
- Rate of intracranial hemorrhage associated with vacuum extraction did not differ significantly from that associated with either forceps delivery
- Fewer than 3% of women in whom an operative vaginal delivery has been attempted go on to deliver by cesarean
- Performing low or outlet procedures in fetuses not believed to be macrosomic is likely to safely reduce the risk of cesarean delivery in the second stage of labor.

CESAREAN BEST PRACTICE

- Prophylactic antibiotics (A)
- Preoperative vaginal prep (B)
- Type (Pfannensteil (A) or Joel-Cohen (C)
- Uterine incision expansion with cephalad-caudad (A)
- Prevention of PPH, oxytocin (B)
- Placental removal spontaneous or manual (A)
- Uterine closure: 1 layer for undesired fertility (A), continuous (B)
- Sharp needles for fascial closure (A)
- Subcutaneous tissue closure (A)
- Skin closure, subcuticular (B)

SYSTEMATIC REVIEWS www.AJOG.org

OBSTETRICS

Evidence-based surgery for cesarean delivery: an updated systematic review

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TABLE 3

Summary of general CD operative techniques

Variable	PKM	JCM	MLM	MMLM
Skin incision	Pfannenstiel[a]	Joel-Cohen[b]	Joel-Cohen[b]	Pfannenstiel[a]
Subcutaneous layer closure	Sharp dissection	Blunt dissection	Blunt dissection	Blunt dissection
Fascia opening	Sharp extension	Blunt extension	Blunt extension	Blunt extension
Peritoneal opening	Sharp entry	Blunt entry	Blunt entry	Blunt entry
Uterine incision	Sharp superficial, then blunt entry	Sharp superficial, then blunt entry	Sharp superficial, then blunt entry	Sharp superficial, then blunt entry
Placenta removal	Manual	Spontaneous	Manual	Spontaneous
Uterine closure	Single layer, interrupted	Single layer, interrupted	Single layer, running	Single layer, running
Peritoneal closure	Closed	Not closed	Not closed	Closed
Fascia closure	Interrupted	Interrupted	Continuous	Continuous
Subcutaneous closure	Not sutured	Not sutured	Not sutured	Not sutured
Skin closure	Continuous suture	Continuous suture	Mattress sutures	Continuous suture

CD, cesarean delivery; *JCM*, Joel-Cohen method; *MLM*, Misgav-Ladach method; *MMLM*, Modified Misgav-Ladach method; *PKM*, Pfannenstiel-Kerr method.

[a] Pfannenstiel skin incision is slightly curved, 2-3 cm or 2 fingers above the symphysis pubis, with the midportion of the incision within the shaved area of the public hair; [b] Joel-Cohen incision is straight, 3 cm below the line that joins the anterior superior iliac spines, slightly more cephalad than Pfannenstiel.

Modified from Hofmeyr,[30] Naki,[31] and Xavier.[34] Some studies report slight variations to these techniques.

Dahlke. Evidence-based cesarean delivery. Am J Obstet Gynecol 2013.

Evidence-based recommendations for CD

CD technical aspect (comment)	Recommendation[a]	Level of certainty[a]	References
Prophylactic antibiotics			
Yes (all CD)	A	High	7-10,102
Type (ampicillin or first-generation ceph)	A	High	101,103
Administration (systemic)	A	High	101
Multiple doses (NR)	D	High	101
Timing (preskin incision)	A[b]	High[b]	11-15,103-105
Thromboprophylaxis[b]	I[b]	Low[b]	16-18
Lateral tilt	I	Low	106-110
Skin cleansing (CHG or iodine)	I	Low	111,112
Preoperative vaginal preparation (iodine)[b]	B[a]	Moderate[b]	20-22
Supplemental oxygen (NR)[a]	D[b]	High[b]	29,30
Indwelling bladder catheter[b]			
None[b]	C[a]	Moderate[b]	23-26
Immediate or 24-h removal[b]	C[a]	Moderate[b]	27
Adhesive drape (NR)	D	Moderate	113,114
Skin incision			
Type (Pfaanenstiel or Joel-Cohen)	C	Moderate	31-36,115-123
Length	I	Low	123
Second scalpel (NR)	D	Moderate	124
Subcutaneous incision	I	Low	
Fascial incision	I	Low	
Rectus muscle cutting (NR)	D	Moderate	125
Dissection of fascia off rectus	I	Low	37
Opening of peritoneum	I	Low	
Self-retaining retractors[a]	I[b]	Low[b]	41
Bladder flap development (NR)	D	Moderate[b]	38-40,126
Uterine incision			
Type (transverse)	B	Moderate	127,128
Stapling device (NR)	D	Moderate	129-131
Expansion (blunt, cephalad-caudad[b])	A	High[b]	42-44,132,133
Instrumental delivery	I	Low	134,135
Prevention of postpartum hemorrhage			
Oxytocin or placebo (oxytocin[b])	B[a]	High[b]	136
Infusion rate (10-40 IU over 4-8 h)[b]	B[a]	High[b]	46,47,49
Carbetocin or oxytocin	C	Moderate	45,50,137,138
Miso plus oxytocin or oxytocin only (oxytocin)[b]	D[b]	Moderate[b]	51-55
Oxytocin or tranexamic acid[b]	B[a]	Moderate[b]	48,56,57

Dahlke. Evidence-based cesarean delivery. Am J Obstet Gynecol 2013. (continued)

TABLE 2

Evidence-based recommendations for CD (continued)

CD technical aspect (comment)	Recommendation[a]	Level of certainty[a]	References
Placental removal			
Spontaneous or manual (spontaneous)	A	High	139-145
Glove change (NR)	D	Moderate	139
Placental drainage[b]	I[b]	Moderate[b]	58
Uterine exteriorization (surgeon preference[b])	C	High[b]	59-66,142,146-150
Cleaning of uterus	I	Low	
Cervical dilation (NR)[b]	D[b]	High[b]	67-70
Closure of uterine incision[b]			
Undesired fertility (1-layer)[b]	A[b]	High[b]	44,72,76,151,152
Desired fertility[b]	C	Moderate	
Decidua/serosa incorporation	I	Low	
Continuous or interrupted (continuous)	B	Moderate	153
Elective appendectomy (NR)[b]	D[b]	Moderate[b]	73
Intraabdominal irrigation			
Saline (NR[b])	D[b]	Moderate[b]	74,154
Peritoneal closure	C[a]	Moderate[b]	75-84,155-165
Rectus muscles reapproximation	I	Low	
Technique of fascial closure			
Running or locked (running, unlocked)	I	Low	
Sharp or blunt needles (blunt)[a]	A[b]	Moderate[b]	84,85,166
Irrigation of subcutaneous tissue	I	Low	
Subcutaneous tissue[b]			
≥2 cm thickness[b]			
Closure or nonclosure (closure)[b]	A[b]	High[b]	167-175
Closure or drain (closure)[b]	A[b]	High[b]	75,87
Closure or drain plus closure (closure only)[b]	A[b]	High[b]	88
Closure of skin			
Staples or subcuticular suture	C[a]	Moderate[b]	89-96,176,177

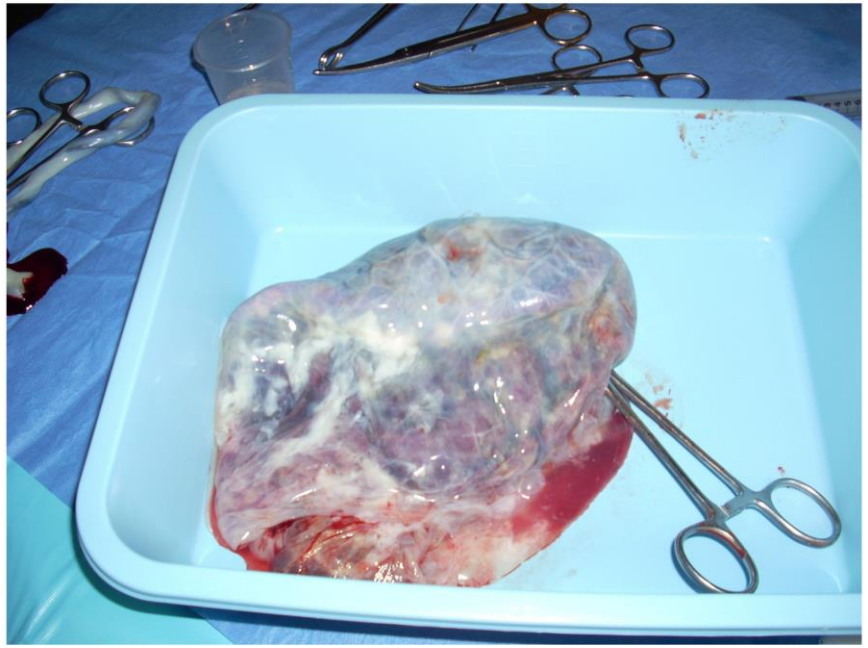
Parentheses indicate the preferred technique. Other recommendations are from Berghella et al.[4]

CD, cesarean delivery; *Ceph*, cephalosporin; *CHG*, chlorhexidine gluconate; *Miso*, misoprostol; *NR*, not recommended; *TA*, tranexamic acid.

[a] See Table 1 for recommendation and level of certainty definitions; [b] Indicates changed or new recommendations based on this review.

Dahlke. Evidence-based cesarean delivery. Am J Obstet Gynecol 2013.

THIRD STAGE OF LABOR



- Active management may decrease the risk for severe postpartum hemorrhage
- Includes starting oxytocin after the delivery of the fetus, before delivery of the placenta
- Early cord clamping (within 1 minute)
- Controlled cord traction to deliver the placenta

RETAINED PLACENTA

- Lack of expulsion of the placenta within 30 minutes of infant birth
  - Active management leads to 98% delivered within 30 minutes
- Physiologic management of the third stage (delivery without uterotonic agents or traction) increases the frequency of retained placenta
  - 30 minutes, 80%
  - 60 minutes, 98%
- Preterm births have a 3-fold higher risk of retention
- WHO concluded that the length of time before making a diagnosis of retained placenta should be “left to the judgement of the clinician”
- Types:
  - Trapped or incarcerated (closing cervix)
  - Placenta adherens (easily separated manually)
  - Placenta accreta spectrum (pathologically invading the myometrium)f

RETAINED PLACENTA

- Administer prophylactic antibiotics (ampicillin, cephalexin, or clindamycin)
- Surgical preparation, bladder catheterization
- One hand follows the path of the umbilical cord through the vagina, cervix, and lower uterine segment to find the maternal-placental interface
- The other hand is placed on the maternal abdomen and used to maintain the uterine fundus in position
- If the cervix is too small, nitroglycerin can be used to relax
- The plane of interface is gently dissected using a side-to-side motion of the fingers until the placenta has been completely separated.
- If unsuccessful, consider curettage

POSTPARTUM HEMORRHAGE

- The under-buttocks drape with measurements
- Weigh the laps, sponges, etc
- Watch for changes in blood pressure, heart rate, and maternal status
- Always consider intravenous fluids and blood products early
- Constant communication with team, patient, and family
- Utilize medications early, mind contraindications (HTN, Asthma)
- Consider procedural support as needed (i.e., Bakri balloon placement)
- Surgical intervention if all else fails or mother is unstable
- Ultimate risk of hysterectomy if bleeding cannot be controlled

PERINEAL LACERATIONS

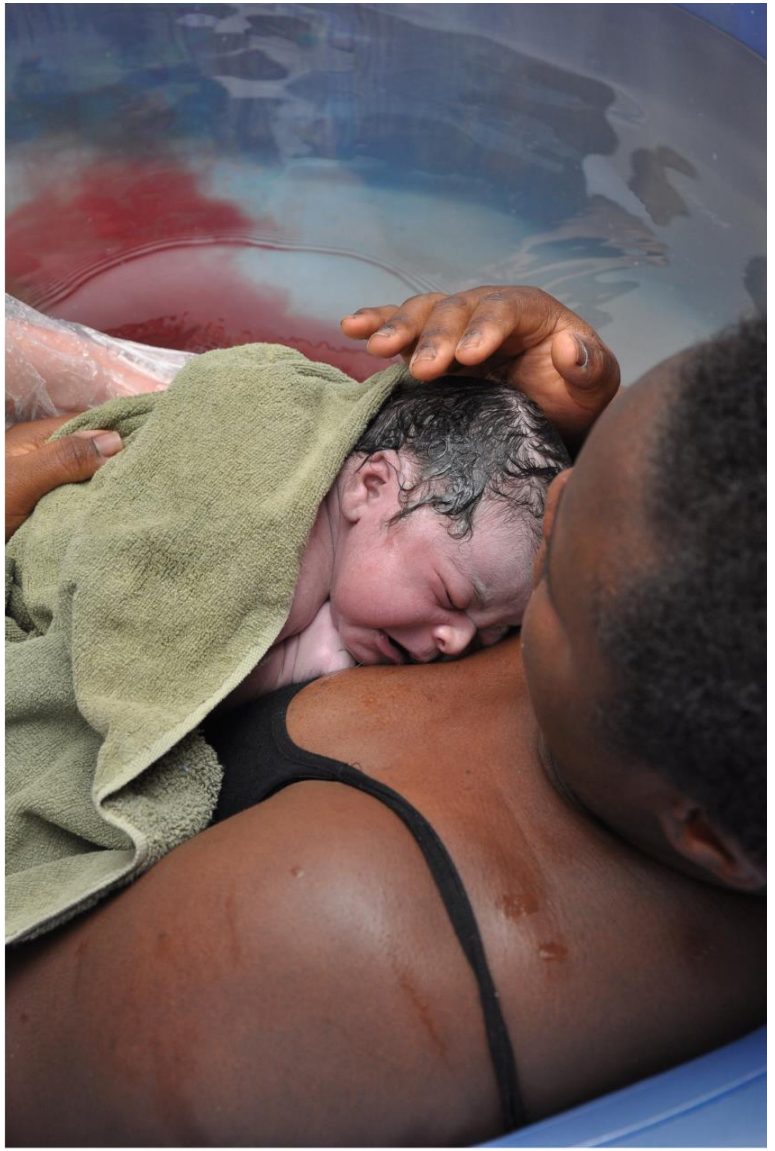
- First degree
  - Perineal skin only
  - Simple repair to approximate
- Second degree
  - Perineum involving perineal muscles but not involving anal sphincter
  - Repair in layers

- Obstetrical Anal Sphincter Injury
  - Third degree
    - 3a: <50% of external anal sphincter thickness
    - 3b: more than 50% external anal sphincter thickness
    - 3c: both external and internal anal sphincter is torn
  - Fourth degree
    - Perineum involving anal sphincter complex and an anal epithelium

THE PUERPERIUM

- Rest
- Recovery
- Lactation
- Support

THE NEWBORN INFANT



Apgar Score

Gestational age_____weeks

Sign	0	1	2	1 minute	5 minute	10 minute	15 minute	20 minute
Color	Blue or Pale	Acrocyanotic	Completely Pink					
Heart rate	Absent	<100 minute	>100 minute					
Reflex irritability	No Response	Grimace	Cry or Active Withdrawal					
Muscle tone	Limp	Some Flexion	Active Motion					
Respiration	Absent	Weak Cry; Hypoventilation	Good, Crying					
			Total					

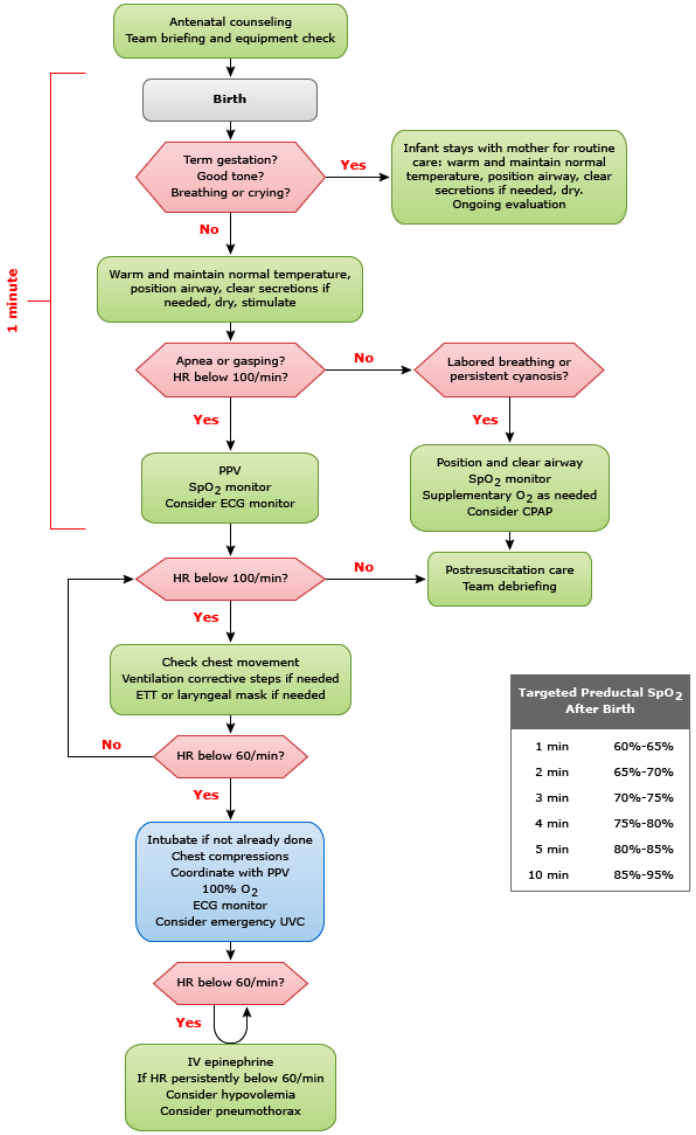
Comments:

Resuscitation

Minutes	1	5	10	15	20
Oxygen					
PPV/NCPAP					
ETT					
Chest Compressions					
Epinephrine					

NEONATAL RESUSCITATION

- Dry the infant
- Warm the infant (skin to skin)
- Position airway and clear secretions if needed
- Tactile stimulation to facilitate respiratory support
- If poor tone, not crying or breathing without difficulty, assess respiratory effort, color, and heart rate



MECONIUM-STAINED FLUID

- Guided by NRP
- Vigorous infant → routine care
- Non-vigorous infant, evidence to not perform endotracheal suction and go straight to endotracheal intubation
  - Maintain oxygenation and ventilation
  - Maintain blood pressure and perfusion
  - Correct metabolic abnormality (hypoglycemia, acidosis)
  - Empirical antibiotics
  - Manage temperature
- Asymptomatic, Apgar 9+ at 5 minutes, normal nursery
- If <9 Apgar at 5 minutes, observed in NICU

https://adu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=92e567dd-5b57-429e-b73a-ae69013aeb87

T H A N K Y O U

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