Obstetric Anesthesia Pocket Guide v 2023.5

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Acronyms

TOLAC – Trial of Labor After Cesarean
VBAC – Vaginal Birth After Cesarean
AMA – Advanced Maternal Age
IUPC – Intrauterine Pressure Catheter
IUGR – Intrauterine Growth Restriction
GxP_{TPAL}

X = # Pregnancies
T = Term
P = Premature
A = Abortions/Miscarriages
L = Living Children

IOL – Induction of Labor
AROM – Artificial Rupture of Membranes
SROM – Spontaneous “”
PROM – Premature “”
PPROM – Preterm Premature “”
PPS/TL – Postpartum Sterilization/Tubal Ligation
Beta Complete – s/p Betamethasone x2
LUD – Left Uterine Displacement
HELLP - Hemolysis, Elev. LFTs, Low Plts
SBAR(r) – situation, background, assessment, recommendations, (response)

Disclaimer: This card is intended to be educational in nature and is not a substitute for clinical decision making based on the medical condition presented. It is intended to serve as an introduction to terminology. It is the responsibility of the user to ensure all information contained herein is current and accurate by using published references. This card is a collaborative effort by representatives of multiple academic medical centers.

Physiology of Pregnancy

CV	- ↑ CO 30-50% 2/2 SV > HR, highest CO immediately postpartum - ↑ blood volume 50% - ↓ SVR, PVR. Unchanged PCWP, CVP - Eccentric LVH with TR, MR - S3 common from rapid filling - May have LAD, flat TIII, ST depr limb/chest
Pulm	- ↑ MV 2/2 TV > RR; ↑ O2 consumption; ↓ FRC 20% - 7.43/30/105/20 normal ABG at end of 1st trimester
Renal	- ↑ GFR 50%→BUN/Cr ~ 9/0.6 mg/dL; bicarb ~20 mEq/L
Heme	- Dilutional anemia (Hgb ≥ 11) 2/2 ↑ plasma vol > RBC vol - Nose bleeds (boggy, friable mucosa 2/2 progesterone) - ↑ most clotting factors + fibrinogen (~400-500 mg/dL) = hypercoagulable after 1st trimester - Leukocytosis - 5% gestational thrombocytopenia = Asx, usually plt > 100k
GI	- GERD 2/2 progesterone and ↓ LES tone - Delayed gastric emptying *only during* labor - Constipation from ↑ Na and H_2O absorption and ↓ GI motility - ↑ Alk Phos 3x b/c of heat stable isoenzyme from placenta - ↓ albumin
Anes	- ↓ MAC req by 20% until 3d postpartum - Larger volume of distribution - N_2O/propofol have little effect on uterine tone - ↑ sensitivity to local anesthetics

Hypertensive Disorders

Gestational HTN	- New HTN that develops after wk 20, resolves after delivery; no associated abnormalities
Pre-Eclampsia	- **DX:** BP ≥ 140/90 w/ ≥ 0.3 g prot/2+ urine dip and/or end organ dysfunc; Severe features: BP ≥ 160/110; HA, epigastric pain, 2x LFTs, visual Δ, plt < 100k, Pulm edema, Cr > 1.1 - **TX:** Consider delivery - **Mg**: 4 g IV over 20 min; followed by 1 g/hr infusion for 24 hrs post delivery; or 5 g IM per buttock (10 g total) if no IV **Mg tox: 9 mg/dL ↓ DTRs; ≥ 12 mg/dL resp compromise; ≥ 30 mg/dL cardiac comp: Tx CaCl 1 g IV or CaGluc 3 g IV** - Peds present at all deliveries 2/2 floppy baby w/ Mg - If laryngoscopy necessary, ppx against ↑↑ BP (labetalol, Mg, Alfentanil, Remifentanil) to avoid CVA
Eclampsia	- LUD, airway support +/- ETT (control BP peri-laryngoscopy) - Mg: 6 g IV over 20 min (2 g if re-loading); followed by 2 g/hr infusion for 24 hrs post delivery; or 5 g IM (gluteal) if no IV - FHR w/ predictable decel and recovery, but reasonable to transfer to OR - Likely no neuraxial until HELLP rule out

Neuraxial Risks & Contraindications

Risks:
1:15 inadequate labor epidural analgesia (**1:25** with CSE/DPE)
1:70 wet tap; **1:100** headache; **1:10,000** nerve injury (lasting weeks to months)
1:150,000 hematoma/infection (**1:250,000** permanent severe neuro deficit)
- “bloody tap” = 10 x ↑ risk epidural hematoma

1:20 postpartum women **w/o neuraxial** have postpartum sensory deficit by exam

Effect of epidural on labor: Wong, *NEJM*, 2005
- No good RCTs for labor so best study compares early vs. late epidural
  - 1st stage shortened by 90 min, 2nd stage prolonged by ~ 8 min
- No increased rate of instrumented deliveries or c-section with epidural

Contraindications:
- Volume depletion, sepsis w/ potential for hemodynamic instability, coagulopathy, local infection, neuro deficits, ↑ ICP, patient refusal

PDPH Management

- Check BP to rule out pre-E; usual c/i to neuraxial apply Katz et al, *A&A*, 2017
- Consider caffeine 300 mg PO x 1, hydration, or fioricet 2 tabs PO q 8 hrs ATC immediately PP. **These conservative measures have limited efficacy
- Epidural blood patch (EBP): **Best evidence - inject autologous blood until pt feels back pressure or 20 mL; 80-90% effective; consider fluoroscopy if difficult

ACLS & ATLS in Parturients

- **Manual LUD (do not tilt pt)** (IVC compressed > 20 wks)
- RSI/cricoid if ETT needed
- If recent Mg, d/c Mg gtt and give CaCl 1 g IV
- IV access above diaphragm
- **CPR** in normal location on chest
- **Emptying uterus** @ 5 min ↑ maternal survival **ONLY IF > 20 wks**
- **BEAUCHOPS: B**leeding/DIC, **E**mbolism (PE/AFE), **A**nesthesia (LA tox; tx intralipid 20% 1.5 mL/kg bolus over 1-3 min, then 0.25-0.5 mL/kg/min), **U**terine atony, **C**ardiac dz, **H**TN dz, **O**ther (5H’s & 5T’s), **P**lacenta abruption/previa, **S**epsis
- Consider abruption → DIC in trauma Morris et al, *BMJ*, 2003; Panchel et al. *Circulation*, 2020

Non-OB Surgery in Pregnancy

-Prefer elective surgery in 2nd trimester (post organogenesis; ↓ risk of preterm labor compared to surgery during 3rd trimester) Koren G et al. *N Engl J Med*, 1998
- Avoid N_2O in 1st trimester; Avoid **NSAIDs**. **Benzos** are OK!
- ACOG 2020: The FDA warns that “repeated or lengthy use of GA or sedation drugs during surgeries or procedures … in pregnant women during their 3rd trimester may affect the development of children’s brains.”
- **FHR**: pre/post if pre-viable; consider continuous fetal monitoring and c-section readiness if viable
- **LUD** if supine and > 20 wks
- **Ventilation**: Maintain $ETCO_2$ ~25-30 mmHg (goal $PaCO_2$ ~30 mmHg)
- Reverse **non-depol NMB** with neostig/**atropine**; **glyco** doesn’t cross placenta leading to fetal brady from neostig; insufficient data to support sugammadex
- **Breastfeeding**: No evidence for pump/dump; avoid codeine, tramadol, > 50 mg IV meperidine

Labor Analgesia

Cover T10-L1 1st Stage; S2-4 2nd Stage

Non-pharm	- Breathing techniques; ambulation; subQ sterile water injections
N_2O	- AKA Nitronox: 50/50 N_2O/O_2; requires 45-60 sec to peak - Nausea, dizziness common - N_2O possibly teratogenic; do NOT use during 1st trimester
Epidural	**‘Standard’ Recipes** - 0.0625% bupiv = 35 mL 0.5% bupiv added to 250 mL NS - 0.1% bupiv = 60 mL 0.5% bupiv added to 250 mL NS - 0.125% bupiv = 83 mL 0.5% bupiv added to 250 mL NS **Adjuncts** - **Epinephrine** – 2-4 mcg/mL - **Fentanyl** – 2 mcg/mL - **Clonidine*** – 50-100 mcg bolus (wait 10 min) then 1-2 mcg/mL *Black box warning for maternal hypoTN and bradycardia **Initiation** - Lidocaine 1.5% + epi 1:200K test dose, 3-5 mL, consider w/holding epi in hypertensive/cardiac patient - 10-15 mL manual bolus of infusate (5 mL divided doses) **PCEA** (bolus/lockout/rate/hr limit) - 0.08% bupiv 8 mL / 8 min / 8 mL / 32 mL - 0.1% bupiv 5 mL / 10 min / 8 mL / 32 mL **PIB** 0.0625-0.1% Bupiv +/- fentanyl 5-10 mL q 30-45 min; PCEA 5-10 mL q 10-15 min
CSE combined spinal-epidural	- Bupiv (*isobaric*) 0.25% 1-2 mL IT +/- 10-25 mcg fentanyl ***CAUTION W/ BOLUSING epidural except 3 mL test dose due to high spinal risk
DPE dural puncture epidural	- After LOR w/ Tuohy, insert spinal needle until CSF return. Do NOT inject IT meds. Remove spinal needle & insert epidural catheter. - Advantage over CSE: early recognition of epidural catheter failure Chau et al, *A&A*, 2017; Yin et al, *J Anaesth*, 2022
SSS single shot spinal	- Bupiv (*isobaric*) 0.25% 1-2 mL +/- 10-25 mcg fentanyl - Usually multip fully dilated, analgesia lasts < 90 min - Assisted Vaginal Delivery: < 30 mg mepivacaine 1.5%, < 30 mg 3% chloroprocaine, or 2.5-5 mg bupiv
Narcotic Frolich et al, *Can J Anaesth*, 2006; Rayburn et al, *Am J Obstet Gyn*, 1989	- **Morphine “sleep”:** 15-20 mg morphine IM +/- 25-50 mg hydroxyzine/benadryl (or 25 mg promethazine) IM/PO - **Fentanyl:** 1 mcg/kg IV single dose prior to c-section, no adverse effects, possibly preferable to meperidine - **Meperidine/Pethidine**: Most commonly used worldwide; IM 50-100 mg (peak 30-50 min); IV 25-50 mg; DOA 2-4 hrs; Possibly less ↓ RR vs morphine; May ↓ FHR variability

Labor Analgesia (continued)

Remi-fentanil PCA	- Typically reserved for patients w/ neuraxial contraindications - Initial dose: 20 mcg/inj or 0.25 mcg/kg ideal body weight (IBW) - Lockout: 2 min, no basal - ↑ 10-20 mcg q 10 min or q 3 contractions up to ~ 50-80 mcg (Typically: ~ 30-40 mcg latent labor, 50-60 mcg active labor) - 30-60 sec onset; peak 2.5 min; half life ~3.5 min - Maternal, fetal, placental esterases limit fetal effect - Supplemental O_2 and continuous SpO_2 required - Peds should be present at delivery
Contin-uous Spinal	- Thread catheter: bolus 0.25% isobaric bupiv 1 mL; run bupiv 0.25 % at 1 mL/hr and titrate (1-3 mL/hr) to effect; no patient-administered bolus. ***Clearly label catheter and pump as intrathecal catheter. Alert nursing and OB team. Follow anticoag guidelines.***

Neuraxial Troubleshooting for Labor

CAUTION BOLUSING IF HYPOTENSION OR FETAL DISTRESS

- Were expectations set? - Did epidural ***catheter*** ever work?
- Check connections & ensure running; check if bolus button used.
- Is pain due to lack of volume/spreading or lack of density or both? Check a level.
  - If volume/spreading issue, give a bolus and ↑ basal rate.
    - Consider ~ 10-15 mL 0.125% bupiv or ~ 6-8 mL 0.25% bupiv
    - Consider pulling catheter back 1-2 cm
  - If density issue, add adjuncts (fentanyl, epi, clonidine) vs. ↑ bupiv conc
- Consider fentanyl 100 mcg epidural bolus in second stage.
- Verify functionality at least **q4h** to identify/replace poorly functioning catheter
- Inform attending if **≥3 top-ups** required: strongly consider replacement

C-Section Antibiotics

Low-risk	Cefazolin 2 g IV (3 g if ≥ 120 kg) (Re-dose if surgery ongoing > 4 hrs since 1st dose or blood loss ≥ 1500 mL)
PCN-allergic	Clindamycin 900 mg IV & Gentamicin 5 mg/kg IV ** Gent dose based on actual weight. If actual weight > 20% ideal body weight (IBW), use dosing weight ***dosing weight** = (adj BW) = IBW + 0.4(actual weight–IBW) (Re-dose clindamycin, NOT gent, if surgery ongoing > 6 hrs or blood loss ≥ 1500 mL)
High-risk (discuss w/ OB)	Cefazolin as above & Azithromycin** 500 mg IV **Infuse over 1 hr, faster rates associated w/ local IV site rxn (Do NOT re-dose Azithromycin for high EBL or prolonged surg)
D&C	Cefoxitin 2 g IV

Elective C-Section - Neuraxial Anesthesia

Goal: T4-6 surgical level of anesthesia
Set patient expectations for what to feel during C-section; Use translator phone
Preop: NaCitrate 15-30 mL PO +/- ondansetron 4 mg +/- metoclopramide 10 mg IV

Spinal/CSE

- 12.5-15 mg 0.5-0.75% hyperbaric bupiv +/- 10-15 mcg fentanyl +/- 100-150 mcg morphine +/- 100-200 mcg epinephrine
- Neuraxial morphine: Peaks at 2 hrs *and* 6-12 hrs, thus only for postop pain; Dose > 200-300 mcg = ↑ side effects
- 0.75% bupiv may have better density than 0.5% bupiv; 1% results in ↑ backaches
- IT lidocaine 2% (3-4 mL; DOA 30-45 min); lidocaine 5% (1-1.5 mL; DOA 60-90 min)
- Ppx phenylephrine gtt is standard of care; give ondansetron 4 mg IV before spinal

Epidural/DPE

Lidocaine 2% + 1:200k epi + bicarb (20 mL lido 2% + 100 mcg (0.1 mL 1:1000 amp) epi + 1 mL bicarb 8.4%); redose 5 mL~ q 45 min, ~ 20-30 mL needed
Must add bicarb to 2% lido + 1:200K epi premade vial (acidified for stability)
Additives: Fentanyl 100 mcg epidural after T4 level achieved. Morphine PF 2-3 mg epidural at *end of case*

Continuous Spinal

- 0.5% isobaric bupiv 1 mL bolus to effect (10-15 mg total dose) +/- 10-15 mcg fentanyl +/- 100-150 mcg morphine

Gehling et al, *Anaesthesia*, 2009

Check block level: Use dispensing pin/ice for checking level from T4-9; use Allis forceps for checking level to T9 prior to prep

Urgent/Emergent C-Section:Neuraxial Anesthesia*

Spinal

As above for Elective. *Caution if recently bolused epidural (high spinal risk)

Epidural

URGENT (Decision-to-Inicision Time ≥ 30 min):
Lidocaine: As above for Elective. ~10-15 mL if epidural was running before

EMERGENT (DTI Time < 30 min):
Chloroprocaine: Recipe: 20 mL chloroprocaine 3% + 1 mL bicarb 8.4%; redose 5 mL ~ q 30 min; consider switching to lidocaine after level achieved

Emergent C-Section: General Anesthesia*

Call for help, AMPLE Hx

***Ask OB if time for neuraxial. If yes, see above, otherwise:**

IV access, NaCitrate (15-30 mL), pulse ox, **LUD,** pre-oxygenate 4 breaths

ENSURE OBs PREPPED AND DRAPED BEFORE INDUCTION

RSI w/ cricoid: Sux 1.5 mg/kg + (propofol 2-3 mg/kg or etomidate 0.2 mg/kg or ketamine 1-2 mg/kg or thiopental 4-5 mg/kg)

Once ETT 6.5 placement verified, **INSTRUCT SURGEONS TO "CUT"**

High gas flow and 2 MAC volatile *until* cord clamp. Try to avoid benzos/narcotics

(0.5 MAC volatile + 70% N_2O) or TIVA *after* cord clamp. Benzos/narcotics OK

When stable: Time out, ABX, OGT, +/- NMB; consider post-op TAP block, PCA

*If c-section for fetal distress, **improve oxygen to baby: SPOILT** (**S**top oxytocin, **P**osition (LUD), **O**xygen, **IV** fluid, **L**ow BP (give pressor), **T**ocolytics (terbutaline 250 mcg subQ; consider NTG SL spray 400 mcg x 2, with phenylephrine)

Neuraxial Troubleshooting for C-Section

1. If inadequate anesthesia from neuraxial, **replace neuraxial** if time allows
2. **Consider pulling back** epidural catheter to LOR + 3 cm
3. **Ensure ALL epidural adjuncts**: 1:200K epi, bicarb, fentanyl 100 mcg EPD; clonidine 100 mcg EPD (caution: maternal hypoTN and bradycardia)
4. **Redose EPD**: at least 5mL q30min 3%CP+bicarb; q45min 2%lido+epi+bicarb
5. **Consider IV** fentanyl, midazolam, ketamine (let peds know of IV meds)
6. **Consider LA switch**: Lido→CP or CP→Lido (anecdotal evidence)
7. If pain after uterine externalization, ask OBs if they can **reinternalize uterus**
8. **Consider LA infiltration by surgeon** if discomfort during skin closure
9. **Consider N_2O**
10. **Consider GETA** if above measures fail or if patient requests at any point

Side Effects During C-Section

Intraop N/V	- Dual agent prophylaxis is standard - Check BP, raise neuraxial level to T4 if possible, reinternalize uterus - Ondansetron 4 mg IV, metoclopramide 10 mg IV; repeat doses x 1 - 3rd line: Dexamethasone 6-8 mg IV (caution: diabetes); prochlorperazine 10 mg IV (somnolence); benadryl 25-50 mg IV; scopolamine patch TD (decreased breast milk); haloperidol IV; very low dose propofol IV - Aprepitant, NK1 R antagonists contraindicated with breastfeeding
Shivering	If no contraindication and *post*-delivery, use meperidine 12.5 mg IV q5 min up to 4 doses or dexmedetomidine 4-8 mcg IV q5 min up to 0.5 mcg/kg
Pruritus	Neuraxial opioid-induced pruritus not histamine-mediated. Naloxone 0.04 mg IV q5 min x 3 doses, nalbuphine 2.5-5 mg IV

Miscellaneous Techniques

Assisted Vaginal Delivery (VAVD, FAVD)	- If epidural in place: vacuum AVD, may need nothing extra; forceps AVD, 5-10 mL1-2% lidocaine +/- bicarb - If no epidural: ask if appropriate to place one
Retained POC, Uterine Inversion	- **NTG:** 100-400 mcg IV boluses up to 500 mcg or 1-3 SL sprays PRN (400 mcg/spray); both +/- phenylephrine IV 50-200 mcg - **GA:** Req 2-3 MAC volatile gases
PPS/ PPTL	- **Existing epidural**: 10-15 mL 2% lido w/ epi + bicarb or 10-15 mL 3% chloroprocaine + bicarb to T4-6 level; +fentanyl 100 mcg - **Spinal**: hyperbaric 0.75% bupiv 1.6 mL + 10 mcg fentanyl; or 2% mepivacaine 45-60 mg w/ 1 mL D5W; or 3% chloroprocaine 45 mg
D&C / Lac Repair	- T&C 2U PRBCs PRN; Consider NPO status, potential coagulopathy - **MAC/paracervical block**; versed, fentanyl, ketamine, propofol prn - **Spinal/Existing Epidural:** Same as PPS/PPTL, need T10 level
External Cephalic Version (ECV)	**37-week**: N_2O or "mini-CSE" (5 mg 0.5% isobaric bupiv + fentanyl 15 mcg); if converts to STAT c-section activate epidural catheter after test dose **39-week**: DPE with test dose + (i) 5-10 mL 3% CP+bicarb+fent or (ii) 10-15ml 2% lido+epi+bicarb+fent; if converts to STAT c-section, continue to dose epidural -Confirm bilateral level prior to ECV -Remove epidural at end of ECV procedure Chalifoux et al, *Anesthesiology*, 2017
Cervical Cerclage	~30 min procedure; high lithotomy positioning; confirm FHR prior **Spinal:** 1.7 mL 3% CP or 1.2 mL hyperbaric bupiv 0.75%; + 15 mcg fentanyl Deep sedation/GAWA/GETA appropriate Lee *A&A*, 2022; Sharawi *A&A*, 2022

Post-Partum Hemorrhage (PPH) > 1000 mL

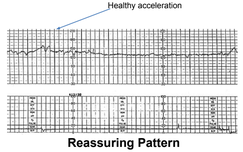
Clinical Trigger: Vaginal > 500 mL, C-section > 1000 mL
4 T's: Tone (atony), Thrombin (coagulopathy), Tissue (retained placenta), Trauma (artery laceration)

Oxytocin/Pitocin Kovacheva et al, *Anesthesiology*, 2015; Heesen et al. *Anaesthesia*, 2019	- MOA: ?; ↑ intracellular Ca - IM/IV/intrauterine routes (WHO rec: 10 U IM/IV) - Do NOT bolus IV rapidly - Consider rule of 3's: 3U IV load over 30 sec post-delivery; consider repeating 3U q 3 min x2 if needed - **COMMUNICATE** W/ OBs TEAM RE: UTERINE TONE Q 3 MIN UNTIL ADEQUATE - GTT at 3U/hr for up to 6 hrs postop - Side Effects: hypoTN, N/V, coronary spasm - If ongoing poor tone/PPH, consider uterotonics below
Methylergonovine /Methergine	- Ergot alkaloid (dopa, serotonin, alpha adrenergic) → smooth muscle contraction - **0.2 mg IM** x 1 dose, then q 2-4 hrs; Avoid IV - **Relatively contraindicated if gHTN, HTN, Pre-E** - Side effects: HTN, seizures, HA, N/V, chest tightness
Carboprost Hemabate/ (15-methyl-PGF2α)	- **0.25 mg IM** (only IM or intrauterine) q 15-90 min, NTE 2 mg/ 24 hrs - **Relatively contraindicated if asthma** - Side effects: N/V, flushing, bronchospasm, diarrhea (2/3rd of pts have diarrhea) - Consider loperamide 4 mg PO intraop
Misoprostol (PGE1 analog)	- 600-800 mcg buccal/SL/PR (10 min onset) - Side effects: temp ↑ to ~ 38.1, N/V, diarrhea
Tranexamic Acid/ TXA (anti-fibrinolytic) WOMAN, *Lancet*, 2017 Sentilhes, *NEJM*, 2021 Pacheco, *NEJM*, 2023	- Inhibits conversion of plasminogen to plasmin - Consider for treatment of most PPH - Not well studied in patients w/ current/hx/risk of thrombosis - 1 g IV over 10 min, repeat x 1 after 30 min if needed - ↓ mortality due to PPH - Little data for aminocaproic acid (Amicar) in PPH - PPX in pts high risk for PPH (controversial): 1g IV over 30-60s within 3 min after birth(s)
Fibrinogen concentrate/ RiaSTAP	- Human-derived, pooled; mix with sterile water ONLY - Consider for PPH w/ confirmed or suspected low fibrinogen state (DIC, AFE, abruption, major hemorrhage) - 2 g fibrinogen conc = 2 vials RiaSTAP = 2-4 units FFP = 10-20 cryo unirts (1-2 pools) - To ↑ fibrinogen 100 mg/dL, give 2-4 g fibrinogen conc
Other	- REFER TO INSTITUTIONAL PPH CHECKLIST - Keep pt warm - CaCl when transfusing (~200mg/unit of product) - Consider activating MTP - Consider cell salvage (call OR front desk) - Consider POC testing, e.g. ROTEM/TEG - Syntometrine = oxytocin + ergometrine (Makerere U only)

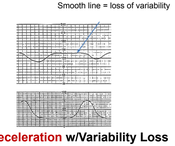
Fetal Heart Rate Monitoring

Category I	- Normal HR 110-160 bpm, moderate variability (6-25 bpm, peak to 15 bpm above baseline x 15 sec), +/- early decels; +/- accels - Occurs in 99% of all parturients = ~ normal
Category II	- All non-category I or III; 'atypical'; occurs in 84% of all parturients
Category III	- Sinusoidal OR, no variability AND: recurrent late decels OR recurrent variable decels OR bradycardia - Occurs in 0.1% of all parturients

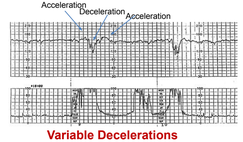
Macones et al, *Obstet Gyn*, 2008



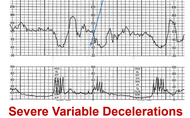
Reassuring Pattern



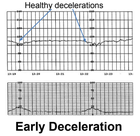
Late Deceleration w/Variability Loss



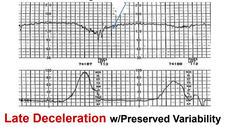
Variable Decelerations



Severe Variable Decelerations



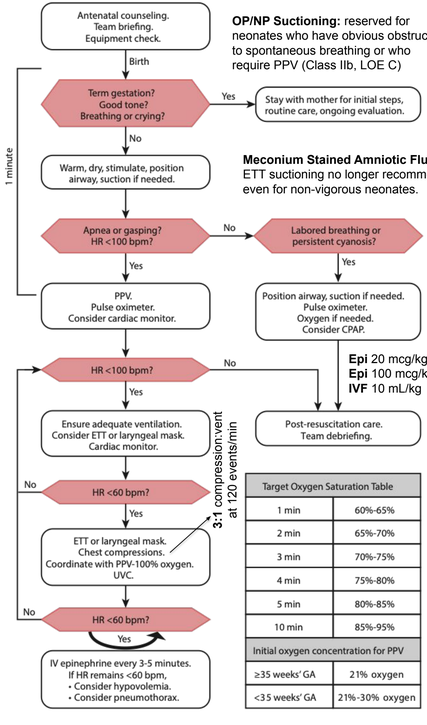
Early Deceleration



Late Deceleration w/Preserved Variability

Images reproduced with permission from Sweha et al, *American Family Physician*, 1999

Neonatal Resuscitation



OP/NP Suctioning: reserved for neonates who have obvious obstruction to spontaneous breathing or who require PPV (Class IIb, LOE C)

Meconium Stained Amniotic Fluid: ETT suctioning no longer recommended, even for non-vigorous neonates.

Epi 20 mcg/kg IV
Epi 100 mcg/kg ETT
IVF 10 mL/kg

Target Oxygen Saturation Table	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%
Initial oxygen concentration for PPV	
≥35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

PPV: RR 40-60, P < 20 cm H_2O if possible (Class IIb, LOE C)

Kg	ETT	@ Lips	Blade	LMA	RR	HR	MAP
< 1	2.5	7 cm	Mil 0	1	< 60	140s	30s
1-2	3	8 cm	Mil 0	1	< 60	140s	30s
2-3	3.5	9 cm	Mil 0-1	1	< 60	130s	30s
> 3	3.5-4	10 cm	Mil 0-1	1	< 60	130s	40s