Obstetric Anesthesia Pocket Guide

v 2023.5

SCAN ME

Card can be downloaded at OpenCriticalCare.org

Card design by numerous collaborators. Please send comments to:
M. Lipnick, J. Markley, M. Lilaonitkul, P. Huang, S. Liou, (ZSFG), and A. Kintu (MakCHS)

ZUCKERBERG SAN FRANCISCO GENERAL Hospital and Trauma Center

UCSF University of California San Francisco

Makerere University

	Phone #

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)

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

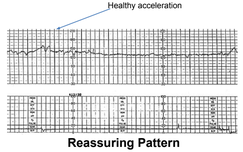
Clinical Trigger: Vaginal > 500 mL, C-section > 1000 mL
4 T's: Tone (atony), Thrombin (coagulopathy), Tissue (retained placenta), Trauma (artery laceration)

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)

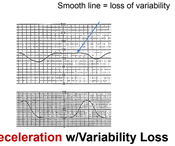
Fetal Heart Rate Monitoring

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

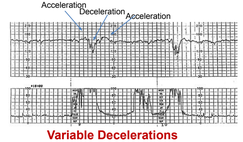
Macones et al, *Obstet Gyn*, 2008



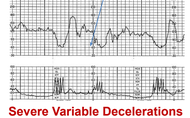
Reassuring Pattern



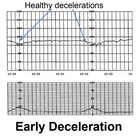
Late Deceleration w/Variability Loss



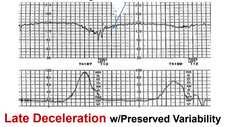
Variable Decelerations



Severe Variable Decelerations



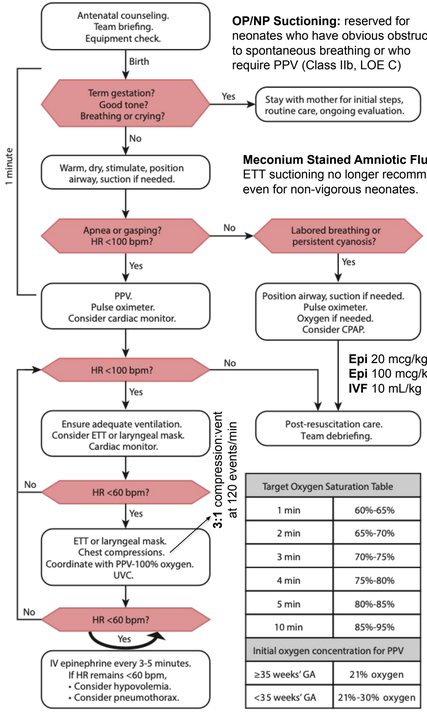
Early Deceleration



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