Not All Blocks Are Created Equal

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Typical Phone Calls from the OB RN to the Anesthesiologist

- Dr. X has ordered a block for his patient in Room 7. She is a G1P0 at 5 cm. She is being evaluated for PIH but we don't have lab back. We will break her water as soon as she is blocked.

- Dr. Y’s patient has been pushing for 2 hours and is now tired and wants a block. HURRY!

- Dr. Z has a multip who is VBACing. Her BMI is 43 but she is healthy and ready for her block. She’s 2 cm but really hurting.

- Dr. QZ’s patient wants a block but wants no males. She doesn’t speak English but her husband will speak for her. She’s been 6 for a couple of hours and isn’t tolerating oxytocin so we’re letting her uterus and fetus rest a while. Could you send a female to block her?

- Dr. A has ordered a block for his multip who was 3 cm an hour ago and who is now 8 cm and screaming. She has had some significant bleeding and some deep variables. Do you need repeated platelets? Her admission platelet count was 125,000.
Which Block Should the Anesthesiologist Assume You Just Ordered?

- Lumbar epidural
- Combined spinal epidural
- Spinal
  - One shot
  - Continuous
- Caudal epidural
- Paravertebral
- Paracervical
- Pudendal
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This is what is generally assumed. But is this block the most appropriate? Would one of the others be better?

Assuming lumbar epidural block is the intended, are all LEBs the same?
Some Anatomic Considerations

Superior view of Injection

A needle is injected posteriorly into the epidural space at the C7 level.

- Spinous process
- Spinal cord within dura
- Superior view of C7 vertebra
- Nerve root
- Vertebral body
The Epidural Space
Watch the Veins!!
Lumbar Spine Variations

- 10% of people have anomalous lumbar spines
- Most frequent anomaly is a 6th lumbar vertebra
- Most painful variation is sacralization of the lowest vertebra (partial joint fusion)
- Most concerning are spina bifida and spina bifida occulta
Ideal Goals for Regional Analgesia

- Pain relief to the degree desired by the patient
- Rapid onset of pain relief
  - How much does speed on onset matter
- No interference with normal birth processes
  - No motor block
  - No hypotension
- Interference with abnormal birth processes
  - Better blood flow to fetus
  - Less dystocia
- Increase maternal safety
  - Less hypertension
  - Avoidance of general anesthesia
When Complete Pain Relief is the Goal:

- Use higher concentrations of local anesthetic to result in better pain relief.
- Use more local anesthetic (volume or concentration) to increase block.
- Add adjuvants (narcotics, vasopressors, clonidine, etc.) that increase analgesia.
- Consider spinal route of administration.
- Thus, the ideal block for pain relief is strong (high concentration), extensive (spread to cover all involved areas) and complex (multiple drugs).
What If Progress of Labor Is the Goal?

- Want to avoid motor block
  - Can use lower concentrations of local anesthetic.
    - Concentrations ≤ 0.125% bupivacaine may lead to fewer persistent OP fetuses
  - Can use intrathecal narcotics alone

- May be advantageous to use CSE
  - Thought to lead to more rapid labor than LEB

- Still want adequate analgesia as pain may impede labor (especially in stage 2) in some women.

- May want increased adjuvants to decrease local anesthetic concentration needed.
What If Fetal Safety Is the Goal?

- Far greater drug amounts are required for epidural analgesia than spinal analgesia (10-fold difference)
  - Theoretically higher fetal levels of drugs with epidural
  - An acidotic fetus may “trap” local anesthetic thus increasing maternal to fetal transfer.
    - This is most significant with lidocaine, less so with bupivacaine

- Spinal analgesia uses lower dose but
  - Spinal narcotics associated with increased incidence of fetal bradycardia
  - Mostly in response to transient increases in uterine contraction
  - Spinal local anesthetic associated with increased hypotension versus epidural
If I Were Pregnant, Would I Want an Early or Late Epidural?

- RCTs of early versus late epidurals show no differences in outcome (CS, instrumental delivery) related to timing of epidural.
- However, longer epidurals associated with more maternal fever of undetermined origin.
  - May lead to more concerns of fetal infection
- Epidural presence may be used to condemn women to bed and/or bladder catheterization.
- Early epidural may reduce risks in morbidly obese women: Less need for general anesthesia with need for urgent CS (risk of which is greatly increased in the morbidly obese).
- Early analgesia reduces cardiac stress in those with significant cardiac disease.
If I Were Pregnant, Would I Want an Fast or Slow Epidural?

- Possible advantages of a Fast Epidural
  - More rapid onset of pain relief?
  - Early assurance that block is working?

- Possible advantages of a Slow Epidural
  - Safer administration of drugs (better test dosing)
  - Less change in maternal hemodynamics
  - Better assurance that block is working?

- Not all fast epidurals are created equal

- Not all slow epidurals are created equal
Caudal Block versus Lumbar Epidural

- **Caudal block**
  - A caudal block is an epidural placed in the sacral region (at the caudal end of the epidural space)
  - Leads to rapid analgesia for the birth canal
  - Delayed analgesia for stage 1 since anesthetic must rise to the lumbar area
  - Early motor block of birth canal – increases dystocia if still in stage 1.
  - Difficult to raise for CS safely as excessive doses of local anesthetic may be required.

- **Lumbar epidural**
  - Late analgesia of birth canal – less dystocia but poorer analgesia is given during stage 2.
    - Can overcome poorer analgesia by adding spinal component (CSE)
  - Easy to raise for CS
Caudal versus Lumbar Needle Site

My doctor explained that these injections are put at a higher level than the coccyx, but well below the spinal cord.
Sacral Anatomy for Caudal Blocks

The “Circle of Errors are Shown”
Single Shot Spinal Blocks

- Used at many hospitals for CS
  - Disadvantages
    - Limited duration
    - Fixed dose = overdosing versus underdosing
      - Extent of anesthesia to a large extent is determined by lumbosacral CSF volume which does not correlate to body habitus, BMI or other external signs.
    - Occasional unexpected failures
      - No rescue from an epidural catheter is available = usually requires General Anesthesia for rescue.
  - Advantages
    - May be safer in patients at risk for spinal hematomas
    - Slightly less cost than CSE
    - Easier than epidurals in less experienced hands – obtaining CSF is a definite end-point. Finding the epidural space requires a higher level of skill.
Continuous Spinal Blocks

- **Advantage:**
  - Ideal for producing rapid, controllable block with excellent analgesia
  - Can increase block rapidly as needed but can also produce slow block to minimize hemodynamic change

- **Disadvantage**
  - Small gauge spinal catheters associated with neurologic sequelae
  - Large gauge spinal catheters associated with post-dural puncture headaches because of large dural hole.
    - However, spinal catheters DO decrease the incidence of PDPH after dural punctures with an epidural needle.

- **Indication for continuous spinal block**
  - Women with difficult airways and high risk of need for emergent CS
  - Women with certain cardiac diseases?
Paravertebral Blocks

- Proposed to improve progress of labor by producing a sympathetic block without a parasympathetic block

- Unopposed parasympathetic activity improves the progress of labor

- Disadvantage:
  - Must be given bilaterally at multiple (≥2) levels
  - More painful than epidural
  - Requires much more training to do properly

- Note: Some 1-sided epidural blocks are most likely inadvertent paravertebral blocks.
Paravertebral Block
Paracervical Blocks

- Effective for stage 1 labor
  - Lasts 1-2 hours. Can be repeated.

- Paracervical block has relative, but NOT ABSOLUTE contraindications during pregnancy
  - Lack of training in pregnant woman
  - Close proximity of presenting part – especially as labor progresses
  - Concerns over fetal toxicity / intravenous injections
    - Relatively high incidence of fetal asphyxia related to uterine arterial spasm / uterine tachysystole from local anesthetic injection

- Useful when regional analgesia is contraindicated but when analgesia is beneficial
  - Maternal spinal cord anomalies
  - Conditions with increases cerebrospinal fluid pressure

- Combine with pudendal block for analgesia throughout labor.