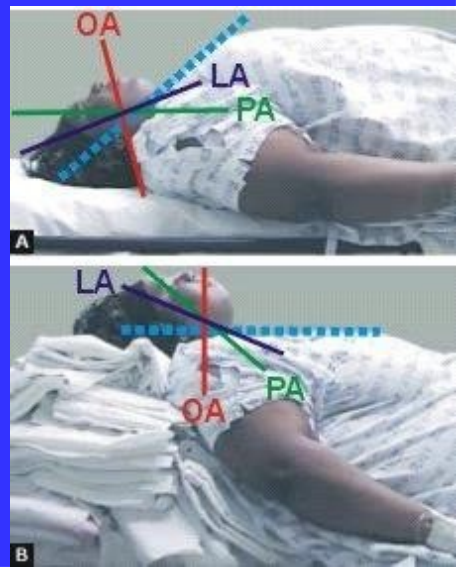




Obstetric anesthesia— what the obstetrician should know.

Tom Archer, MD,
MBA UCSD
Anesthesia





Learning objectives

- Why is OB a unique environment for us, the anesthesiologist?
- How should we treat you, the obstetrician?
- How should you treat us?
- What can we do for you and our

Learning objectives

- What are our major worries (potential disasters)?
- What are the common OB anesthesia complications?
- Other topics.

Obstetrics– a unique environment for the anesthesiologist

- A happy, “normal” event, unlike other “surgery”.
- Patients are usually in pain when we meet them.
- Most patients want to be awake for the birth (the “procedure”).
- Lots of family around (and in OR).

Cesarean delivery-- a unique psychosocial surgery



C-section – a unique psychosocial surgery

- Unique surgery, happy event gone awry.
  - Strike a balance between “happy event” and “risky surgery”.
  - Most patients are awake– and want to be.
  - Team approach (patient, family, nursing, OB, anesthesia)
  - Support person present in OR.
  - Need for utmost discretion about

How should we treat you?

- “Private practice approach”: we are all here to take excellent, efficient and profitable care of the patient.
- Availability
- Responsiveness
- “Management by walking around”
- Proactive (when they call for strip review in Room #7, we go in too).

How should we treat you?

Our antennae need to be out.

Anticipate and be available

- Know every patient on the floor. Introduce yourself early.
- Be accessible to OBs and nurses.
- Get informed early about potential problems (airway, obesity, coagulopathy JW, congenital heart disease)

Anticipate and be available

- We need a certain knowledge of OB to know what is going to happen. Try to think one or two steps ahead.
  - “Placenta isn’t out yet in room 7”
  - “The lady in 6 has a pretty bad tear.”
  - “Strip review in 3, please.”
  - “We can’t get an IV on the lady in 4.”
  - “Can you give us a whiff of anesthesia in 8? We don’t need much.”

What you should expect from your OB anesthesiologists

- Eager to meet, greet and evaluate the new patients
  when they first come in.
  - Good patient care
  - Good human relations
  - Good business

- Listens well and respectfully answers patient questions.

- Proactive approach to problems (obesity, fear, bleeding,
  coagulopathy, hx of anesthesia problems).

Specific technical skills

- IV access
- Arterial access and monitoring
- Hemodynamic intervention (pressors, antihypertensives)
- Fluid resuscitation
- Respiratory emergencies
- Seizures (eclampsia or LA toxicity)
- Morbid obesity (please involve us ASAP)

What we like from you, the obstetrician

- Get us involved early!
  - If we have the right attitude, we will *never* be upset with your getting us involved early!
    - Morbid obesity
    - Asthma
    - Anesthesia fears, Hx of problems
    - Any significant medical problem

What we like from you, the obstetrician

- Treat us like an consultant, not a technician.
  - We have our own, valid point of view and concerns.
  - Just like you, we want the best outcome for mother and child.

What we like from you, the obstetrician

- Tell us what has happened with the patient and what you need to do– don’t tell us what anesthetic to give.

- For you to dictate the anesthetic clouds the picture (and makes us defensive).

What we like from you, the obstetrician

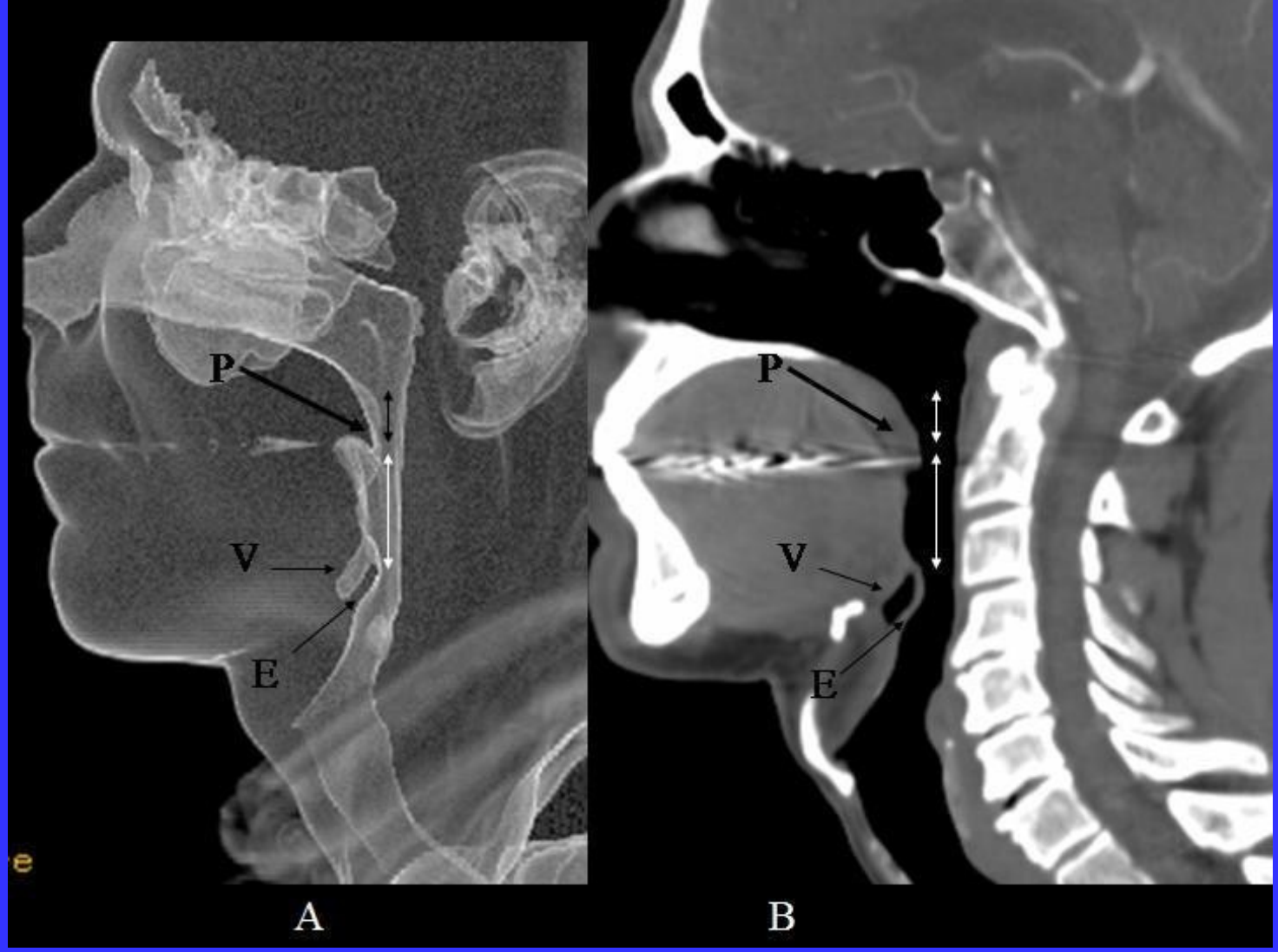
- For example, say: “The patient has a retained placenta and the uterus appears to have contracted down around it, so we need to relax the uterine muscle and manually take out the placenta.”
  - This could be achieved with GA or IV analgesia plus nitroglycerin.
- Don’t say, “This patient needs a spinal so I can get the placenta out.”
  - Spinal will not relax uterine muscle.

Tell us what is going on with the patient and what you need to do.

- Let us design the anesthetic plan to give you and the patient the conditions that you need.
- That’s our job!

Our major concerns

- The *AIRWAY*.
- Just exactly what does that mean?



The AIRWAY, relevant in OSA and always in anesthesia. Vocal cords are behind the tongue!

My “airway” definition

- “Anatomical and functional patency of the pathway from outside world to the alveoli.”
- “Ability to breathe or have someone breath for you.”
- “Secure airway” is the above plus the fact that the airway can’t easily be lost or contaminated.

What are the threats to the airway?

- You and I are the primary threats!
- We want to help!
- We want to “save the baby”!
- Will we choose to induce anesthesia and operate without proper consideration of the risks?

"STAT C/S"

- Often "a flail".
- "We've got to go. NOW!"
- Egos and emotions run high.
- Does the patient know what is happening?
- Talk to patient. Informed consent.
- Don't endanger the mother to "save" the baby.
- Know when and how to say "no" to the OB.
- Stay calm.
- Cover the basics (H&P, IV access, airway, informed consent, patient

Wonderful and dangerous drugs

- Narcotics diminish respiratory rate (to zero!)
- Propofol, midazolam will cause upper airway obstruction (tongue falls back and obstructs).
- High spinal or epidural can paralyze phrenic nerve
- Severe hypotension will cause medullary ischemia and apnea
- Seizures due to LA toxicity will interfere with breathing.

Wonderful and dangerous drugs

- Loss of consciousness (LOC) is associated with loss of gag, swallow and cough
- Any LOC can allow aspiration of regurgitated gastric contents

The “fundamental laws of anesthesia”

- Relieve pain, but only if you don’t kill someone.
- Death or brain damage are usually caused by a breathing (airway) problem.

Corollary to the “fundamental law”

- If you want to make an anesthesiologist uptight and ornery, ask her to use her wonderful and dangerous drugs when the airway cannot be secured.

- Nitty gritty: Don’t put someone to sleep unless you are sure you can breathe for them.

How do we kill patients in OB anesthesia?

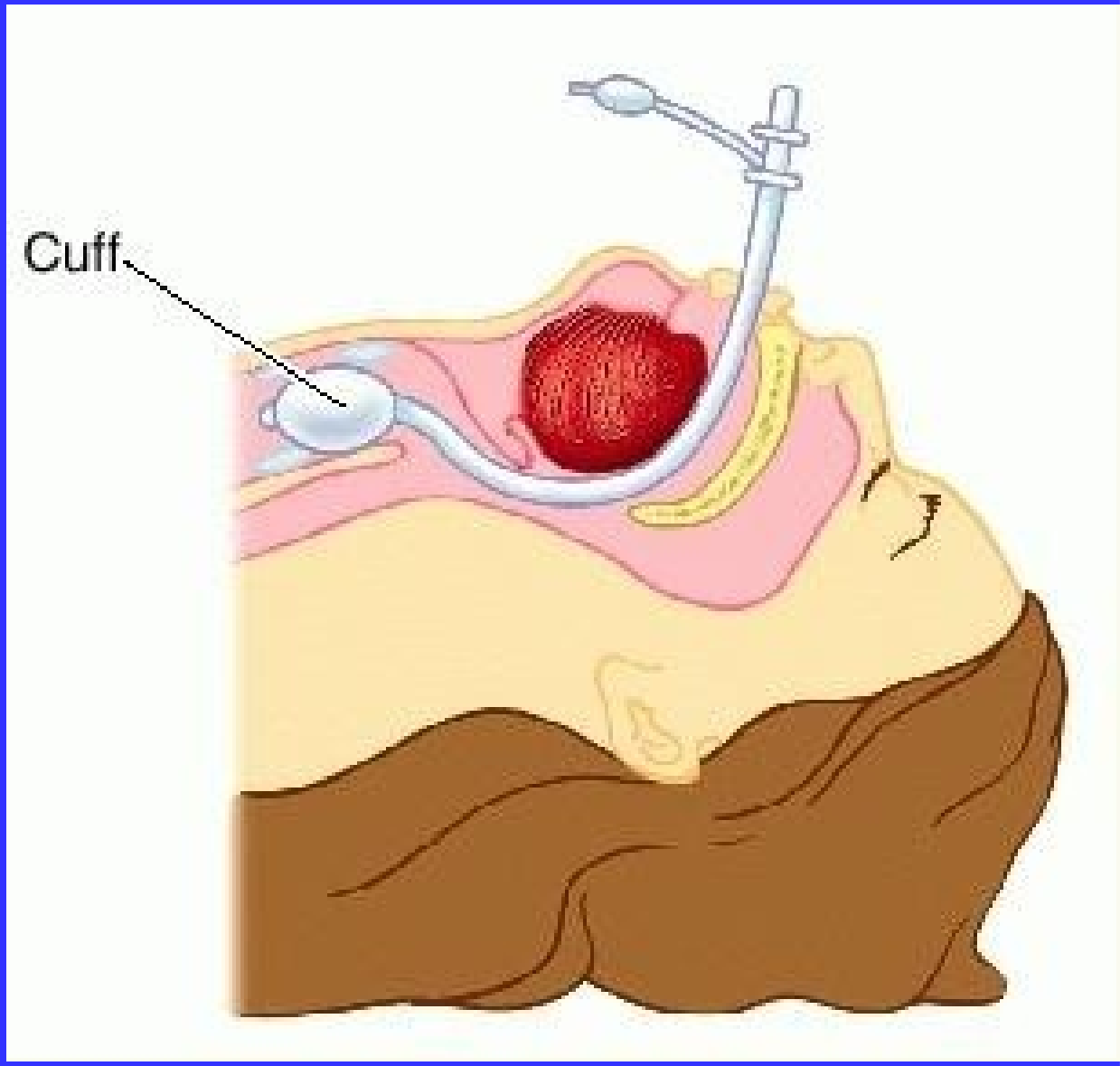
- “Can’t intubate, can’t ventilate” scenario.
- Rush to the OR, pressure to “put the patient down” to save the baby.
- IV induction, paralysis.
- Panic, confusion, inexperience, bad luck

Intubating a dolphin would be very easy.

They have a “blowhole”.

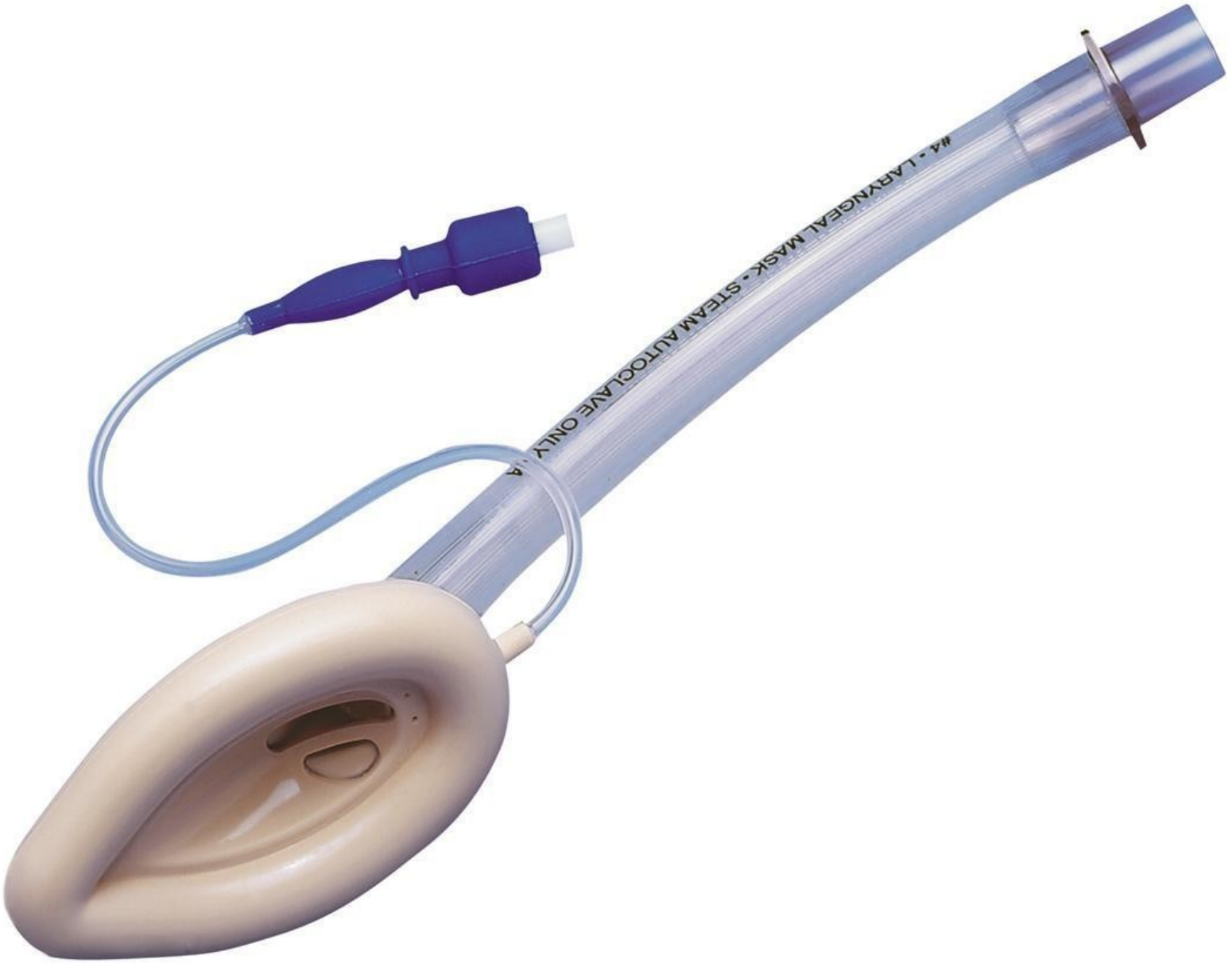


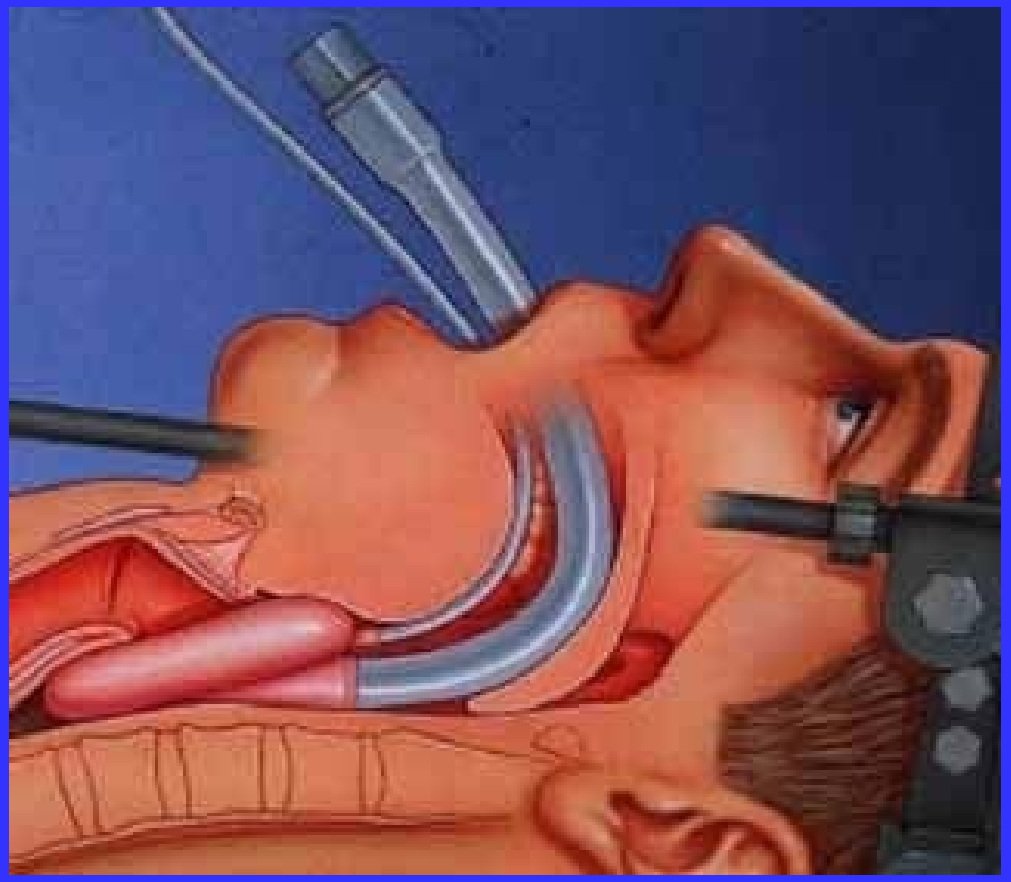
Unlike dolphins, humans have a breathing orifice that is hard to get to.





http://www.healthsystem.virginia.edu/Internet/Anesthesiology-Elective/images/anesth0018.jpg


#4 - LARYNGEAL MASK - STEAM AUTOCLAVE ONLY



www.anecare.com/.../QED-spontaneous-brief.html

The stat / urgent cesarean delivery: what are we thinking?

- What is going on? Blood loss, fetal distress, prolapsed cord?

- A key question we have for you: Do we have time for regional (probably spinal)?

The stat / urgent cesarean delivery: what are we thinking?

- Minimal evaluation:
  - Informed consent (language barrier, haste of staff, everyone assumes the patient knows).
  - Airway (can I get the tube in?)
  - IV access (really in the vein, not infiltrated)
  - Allergies
  - Major co-morbidities (coagulopathy, DM)
  - Significant meds
  - Problems with anesthesia in past

- *We should already have this information!*
  - *This is the purpose for knowing all the patients on the unit!*
  - *If we don't have it, we must get it before proceeding.*

Protocol for general anesthesia for CD

Two to three minutes of “pre-oxygenation” (patient breathes 100% O2 to fill lungs with same).

Pre-oxygenation provides a reserve of O2 for period of apnea after induction and paralysis and before ventilation.

Functional residual capacity (FRC) is our “air tank” for apnea.



www.picture-newsletter.com/scuba-diving/scuba... from Google images

Pregnant Mom has a smaller “air tank”.

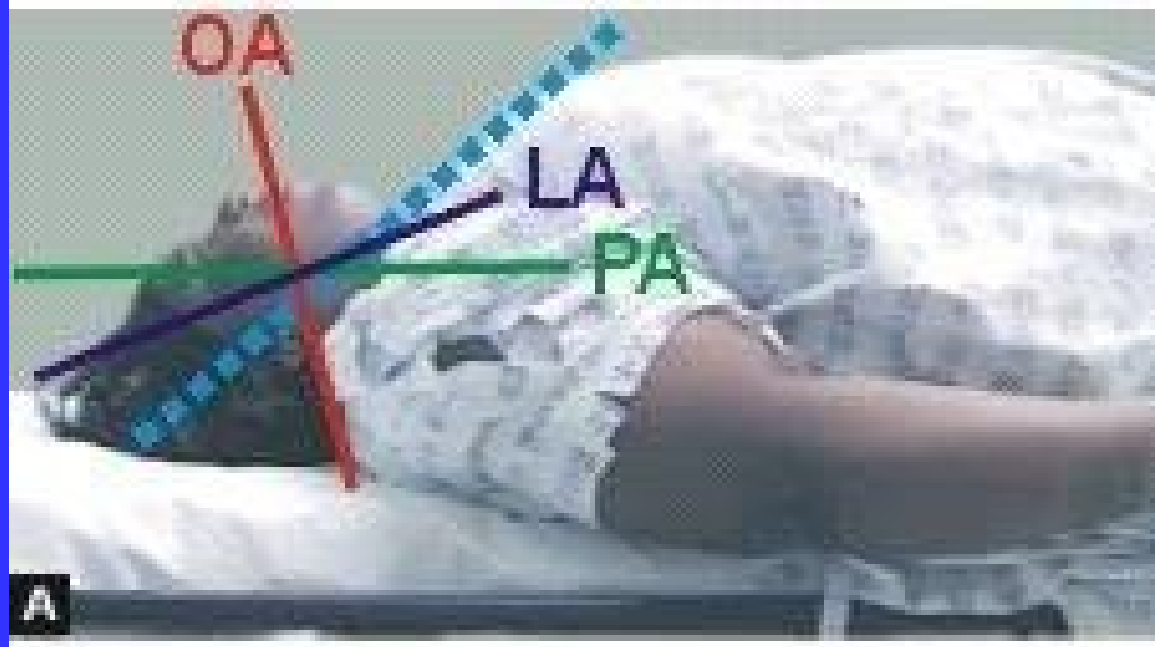


Non-pregnant woman

www.pyramydair.com/blog/images/scuba- web.jpg

“Ramping up” the obese patient to facilitate intubation

www.airpal.com/ramp.htm





Protocol for general anesthesia for CD

Abdomen is prepped, draped, OBs have knife in hand, ready to cut, prior to induction.

- We do this to minimize anesthetic drug transfer to the fetus.

Protocol for general anesthesia for CD

- We induce unconsciousness with propofol, paralyze muscles with succinylcholine, laryngoscope patient, intubate trachea, inflate cuff, confirm placement...

- Then we let you know that you can proceed with the incision.

Protocol for general anesthesia for CD

- Inducing the patient is often a “flail”, emotions run high, everyone is rushing and or impatient.

- Clear, simple, respectful communication, please:
  - “The patient is still awake. Do not make the incision yet.”
  - “May I make the incision now?”
  - “Is her abdomen tight?”

Protocol for general anesthesia for CD

- Don't say:
  - "Are we ready?"
  - "Can we go?"
  - "Is she ready?"
- Be calm, clear, simple.
- We are going as fast as we safely can– and hopefully no faster.

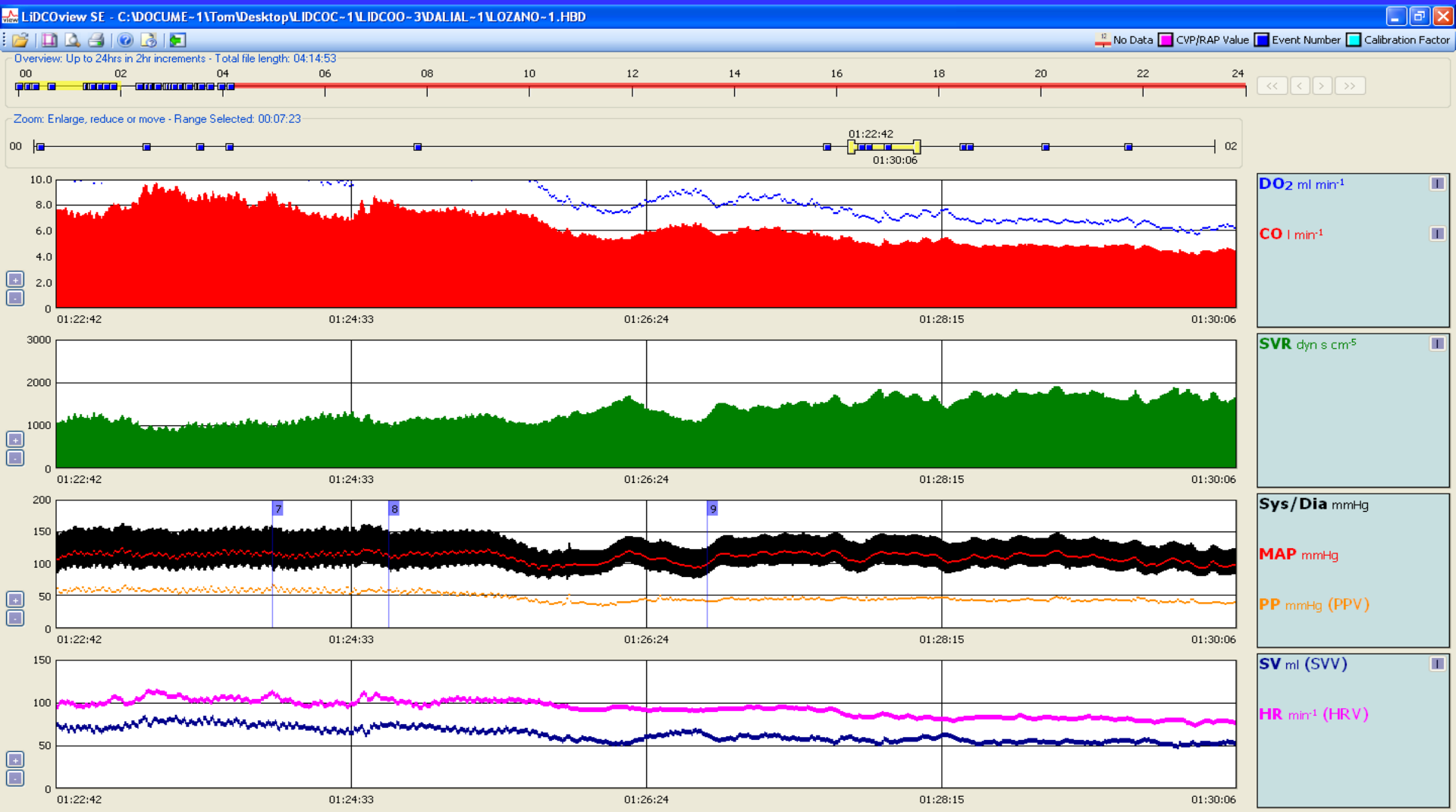
General anesthesia--advantages

- Fast
- Reliable (if you get the tube in).
- Doesn’t cause sympathectomy
- Duration is flexible
- Patient is not awake (to experience problems).
- Can be given despite coagulopathy

General anesthesia--advantages

- SVR is maintained high (no need to increase CO to maintain MAP)
  - Hypovolemia
  - Stenotic cardiac valve lesion
  - Pulmonary hypertension
  - Potential R>L shunt

JW with previa / accreta for c-hyst. GA. Induction at 7, 8, intubation before 9, incision after 9. Note rise in SVR and fall in CO with GA.



General anesthesia--disadvantages

- Patient not awake for birth.
- Unprotected airway.
- Possible “can’t intubate, can’t ventilate” scenario.
- Nausea, post-op pain, sore throat.

Spinal--advantages

- Uniquely appropriate in C/S (happy event).
- Really amazing when you think about it.
  - Awake and smiling.
  - Arms and hands are normal.
  - Major surgery inside the abdomen.
- Quick, solid, simple, reliable, pretty safe.
- LA + narcotic gives great block.
- Can give long-acting analgesia (intrathecal MS)

Regional anesthesia for c/s in Turkey (SOAP outreach)



Worries about spinals and epidurals

Spinal– absolute contraindications

- Patient refusal
- Uncorrected hypovolemia
- Clinical coagulopathy
- Infection at site of injection

Spinal– relative contraindications

- Spinal cord, LE nerve disease.
- Spinal deformity, instrumentation
- Back problems / fear of block
- Laboratory coagulopathy

SAB–
relative contraindications

- *Potential* for hypovolemia (e.g. non- bleeding previa)
- Stenotic cardiac valve lesions
- Pulmonary hypertension

Spinal--disadvantages

- Fixed duration (unless continuous spinal).
- Rapid onset of sympathectomy or high block.
- Small chance of PDPH.

Epidural worries

- Same as spinal, plus...
- Local anesthetic toxicity (seizure).
- Inadvertent subarachnoid injection with “total spinal”
- In a way, epidural is more dangerous than spinal because of larger drug dose.

Common OB anesthesia complications

- Hypotension
- Inadequate pain relief
- Inability to push (too much motor block)

Common OB anesthesia complications

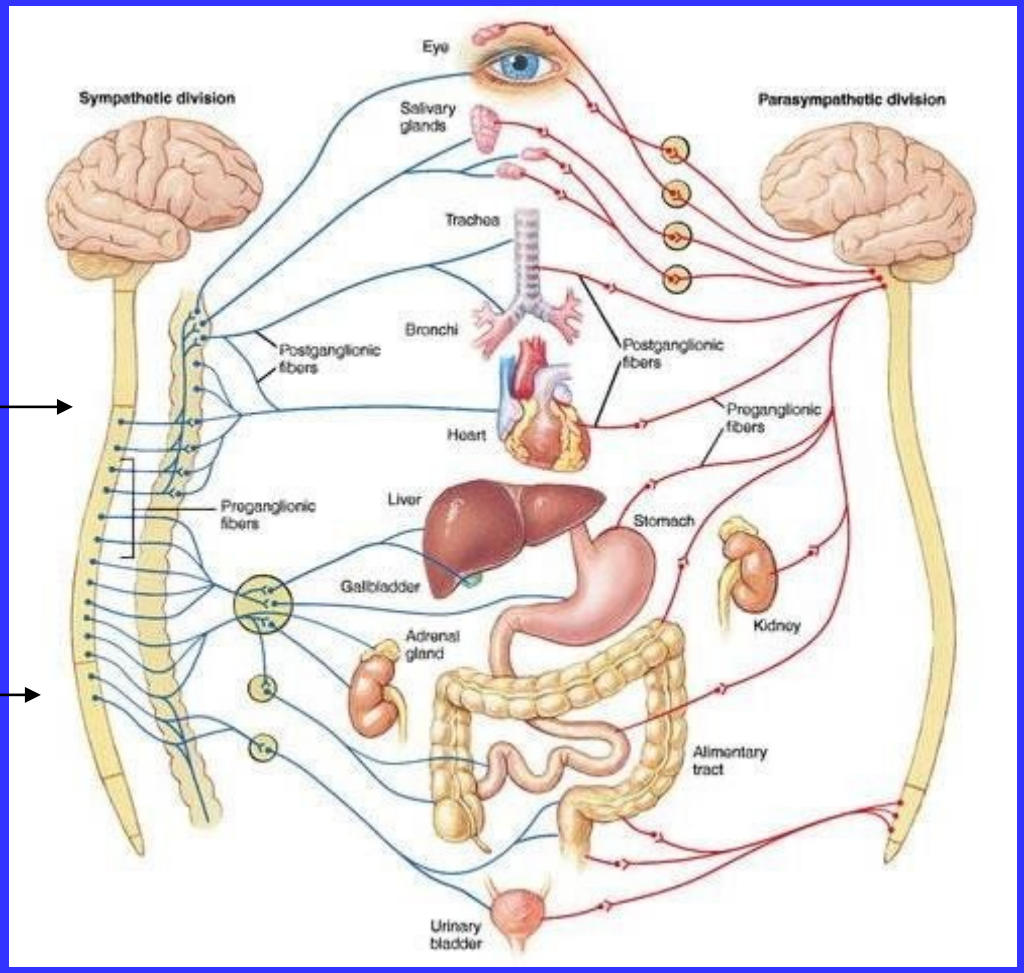
- Post-dural puncture headache (“spinal headache”)
- (Transient) lower extremity neuro deficit

Hypotension from spinal or epidural

- Can cause uteroplacental insufficiency and fetal distress.
  - Try to avoid with 500 mL crystalloid “bolus or preload”
  - Rx with fluids, phenylephrine or ephedrine.
  - LUD
  - O2
  - Once block is functioning patient should NOT lie flat on her back (this is frequently

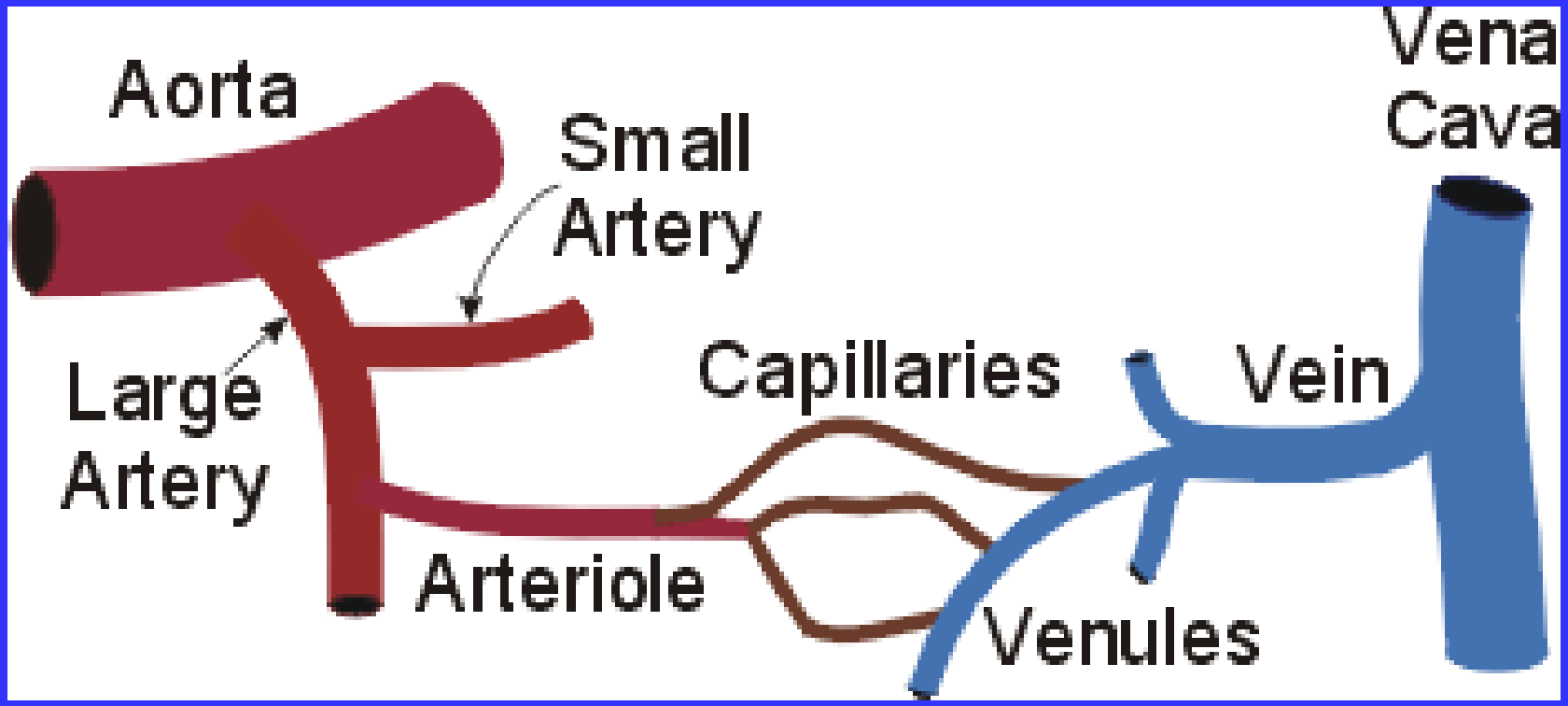
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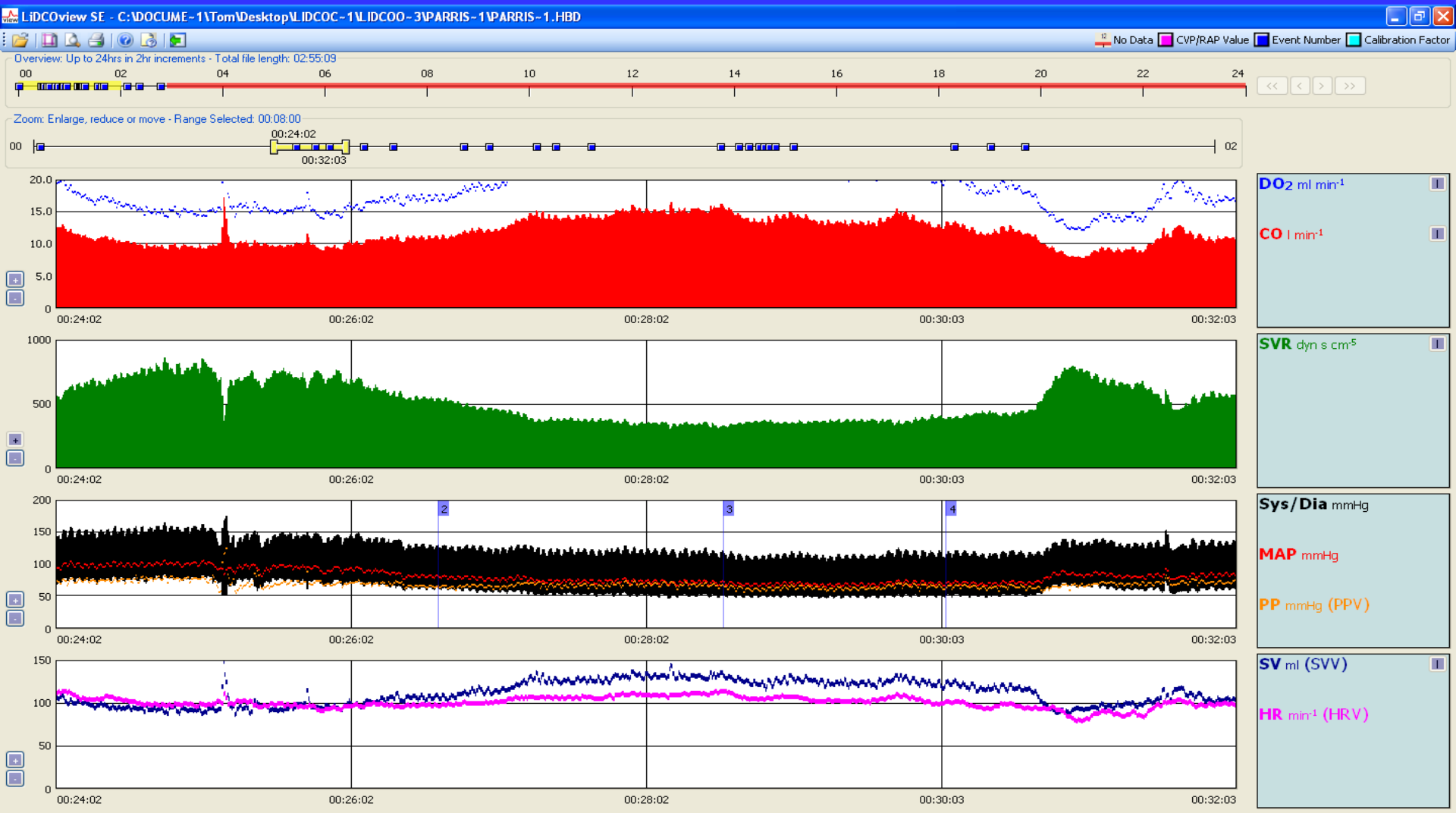
Sympathetics go to internal organs and to veins and arterioles. Blocking sympathetics decreases venous tone and arteriolar tone. This decreases venous return and systemic vascular resistance.

SAB / epidural cause sympathectomy– dilation of (capacitance) veins and (resistance) arterioles



www.cvphysiology.com/Blood%20Pressure/BP

38 y.o. female, repeat c/s, 420 #, gestational hypertension, continuous spinal: fall in SVR, rise in CO with onset of block. Increased SVR with phenylephrine.



If SVR falls with sympathectomy and CO cannot rise...

- BP falls catastrophically
- This is why we don’t give spinal to hypovolemic patients

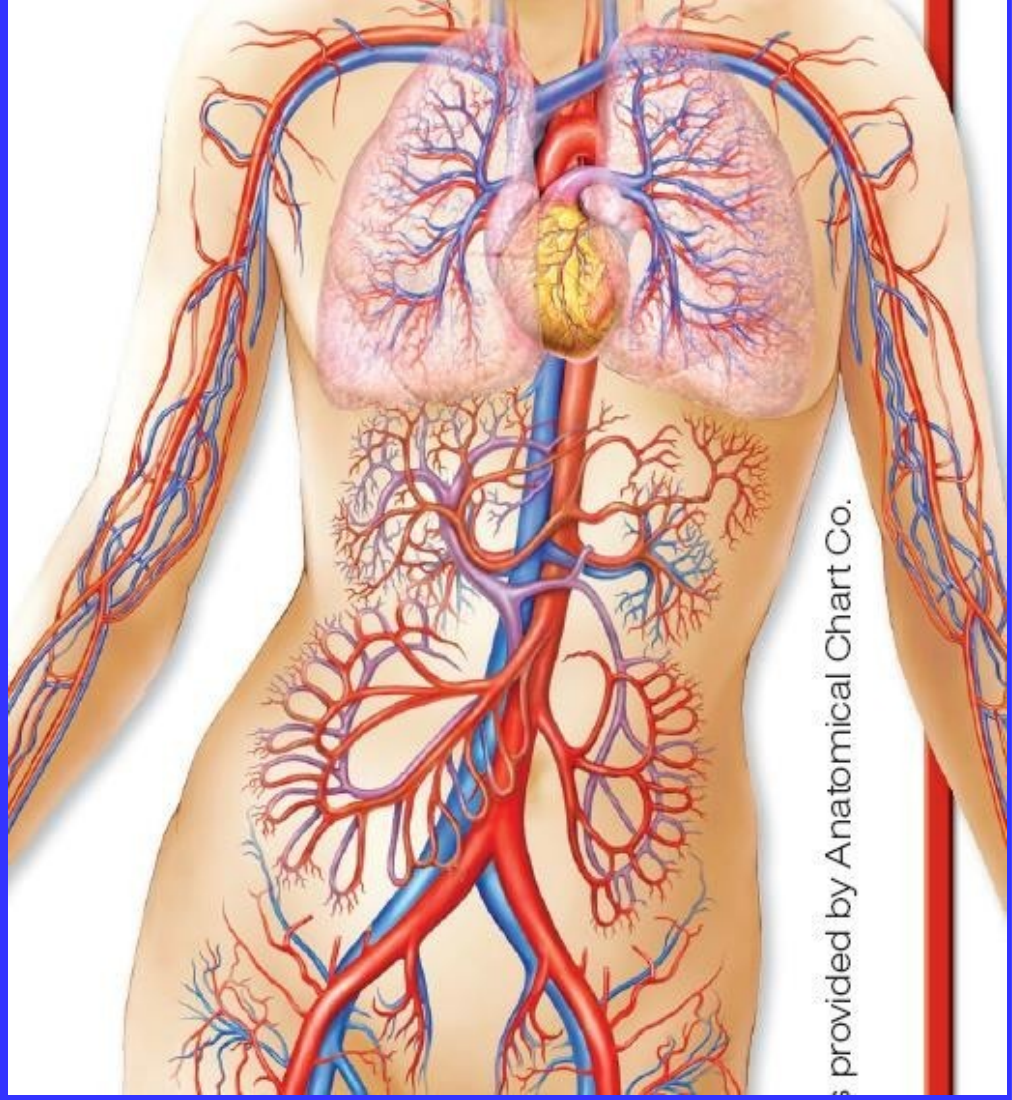
Preventing or treating hypotension from sympathectomy: augment venous return (CO).

- Trendelenburg (empty capacitance vessels into central thoracic veins)? Traditional, but may not be true.
- LUD (get pressure off vena cava)
- Fluid loading (fill capacitance vessels)
  - Crystalloid
  - Hetastarch
- Venous constrictors (inc venous return)
  - Ephedrine, phenylephrine

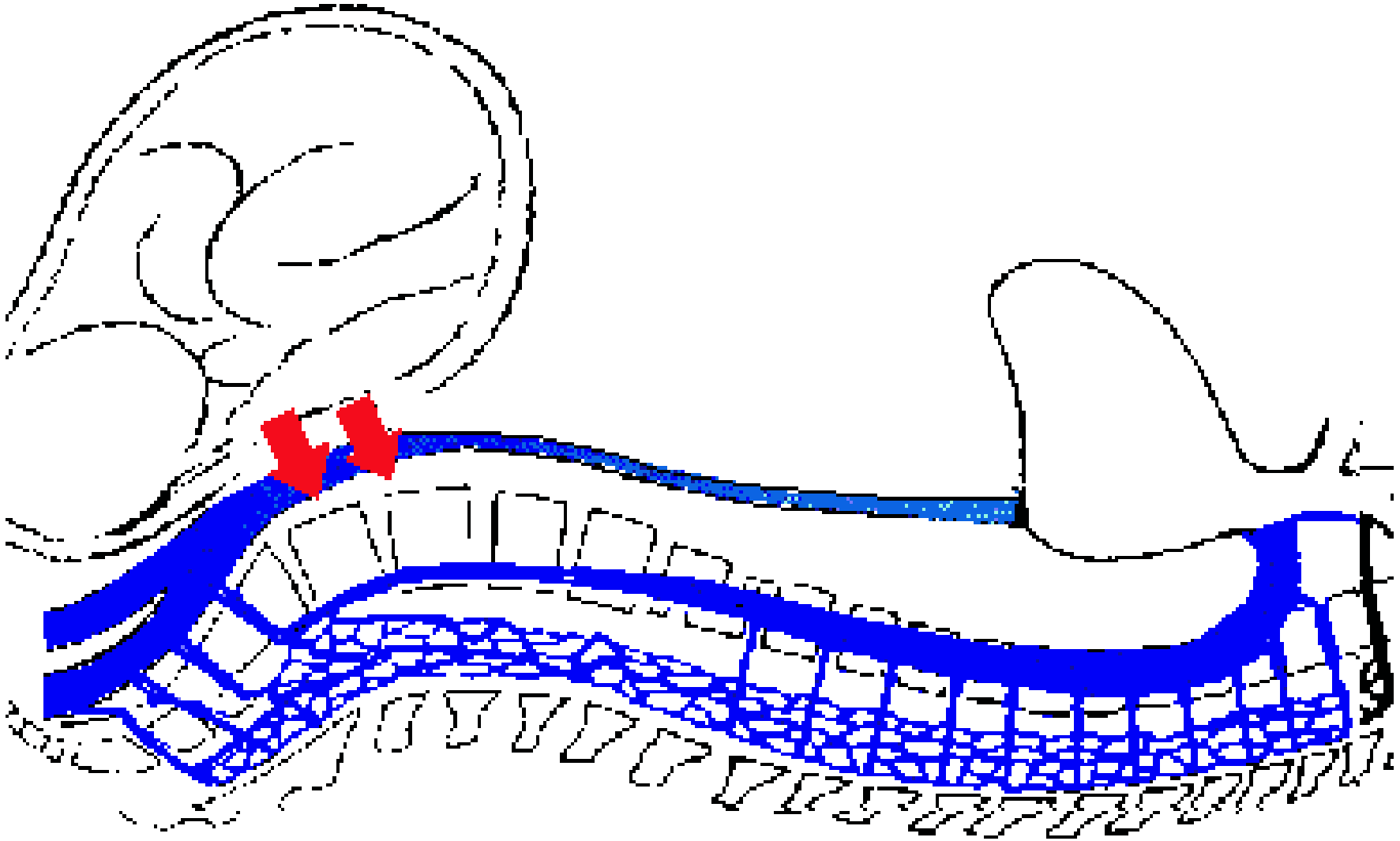
Preventing or treating hypotension from sympathectomy: augment venous return (CO).

- Delivery itself usually augments venous return!
- Autotransfusion with uterine contraction.
- Relief of aortocaval compression.

Left uterine displacement avoids aorto-caval compression, and promotes good maternal BP and good placental perfusion.



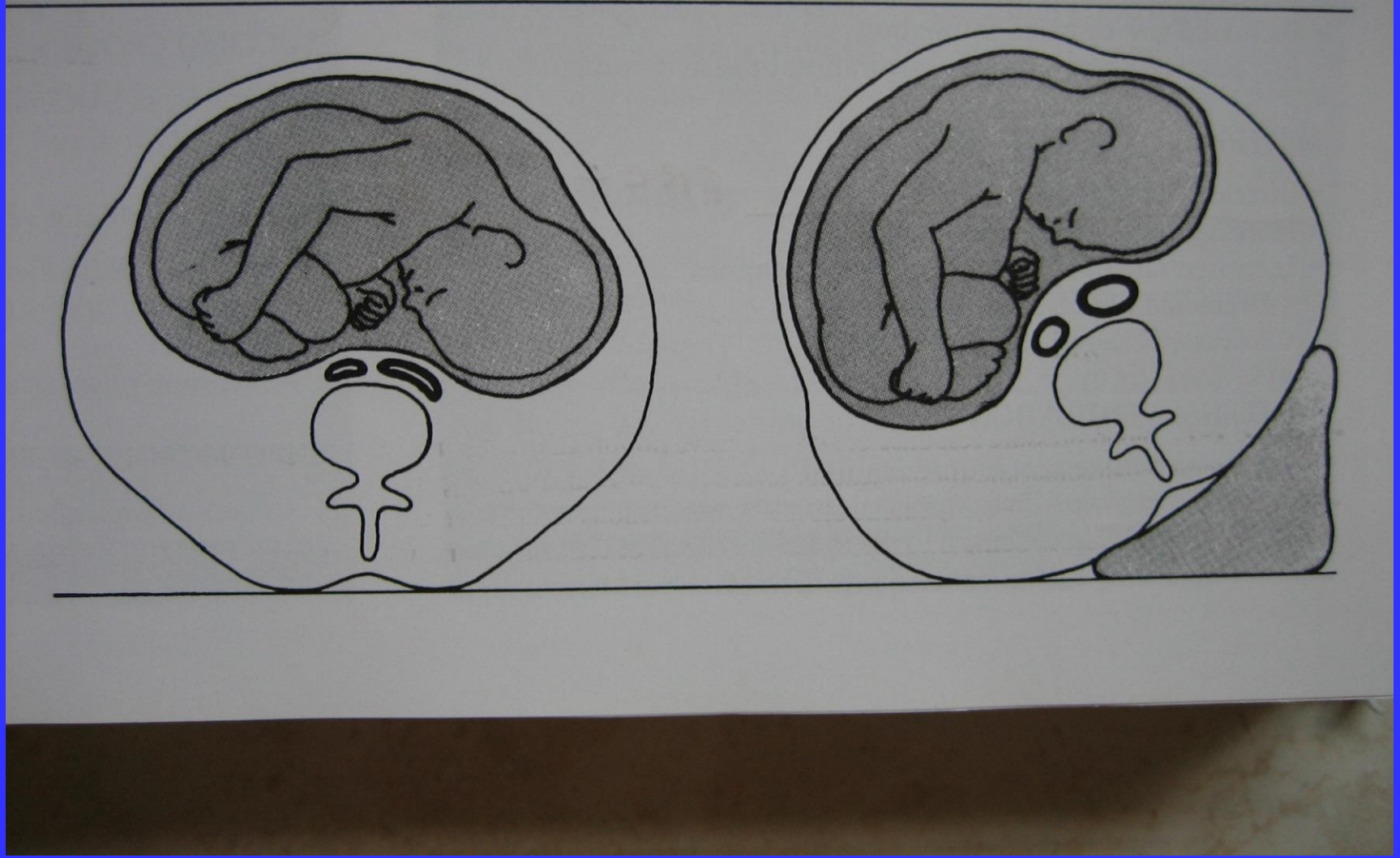
Colman-Brochu S 2004



http://www.manbit.com/OA/f28-1.htm

oplacental blood flow
ine position.[42]

Young[197] found the incidence of failed endotracheal intubation in obstetric patients to be 1:280 (i.e., 7 of 1980 cases),



Chestnut chap.
2

Inability to push

- Excessive motor block due to too much LA. Pelvic muscle paralysis may prevent proper fetal head rotation.
- Modern OB anesthesia practice is to use dilute LA (bupivacaine or lidocaine) + a lipophilic narcotic (fentanyl or sufentanil).
- We need to back off if block is too

Incomplete pain relief

- Malpositioning of the catheter
  - Not in epidural space (they do work out)
  - Too far in the space (one sided block)
  - Pull back 1 cm
  - Replace catheter

Incomplete pain relief

- Not enough LA
  - But don’t try to fix a bad catheter with more medicine!

Incomplete pain relief

- Full bladder?

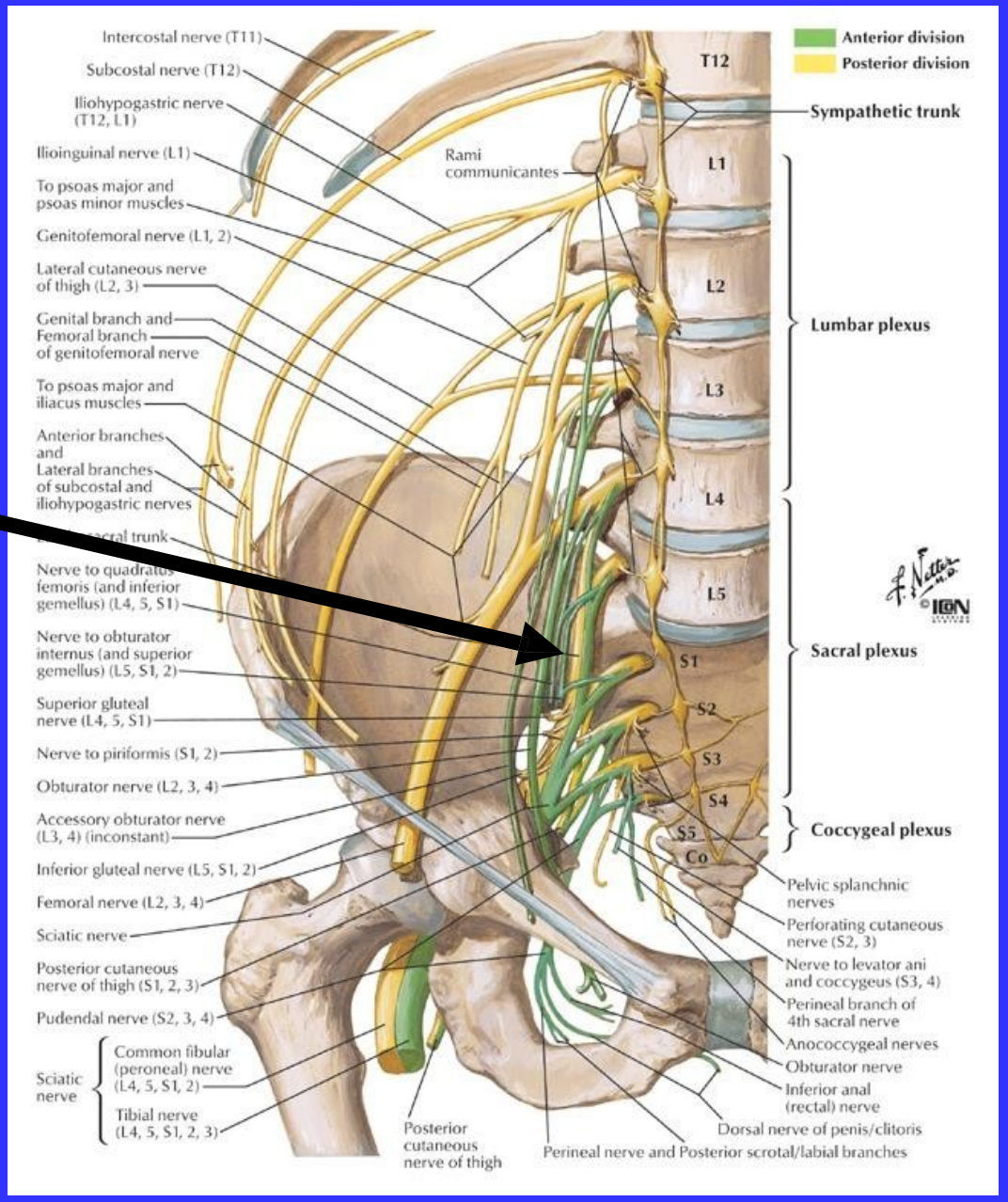
- Occiput posterior presentation—
  - Direct pressure of occiput on sacral nerves
  - This is hard pain to block, needs higher concentration of local

OP presentation

Severe labor pain

Baby's head can compress lumbosacral trunk at pelvic brim

Sacral pain during labor that is hard to



Lower body neuro deficit after neuraxial anesthesia

- Usually due to nerve stretch / pressure due to aggressive positioning.
  - Sitting “Indian style” to “bring baby down”
  - Extreme hip flexion while pushing
  - Buttock wedge pressure on sciatic nerve.
  - Stirrups pressure on peroneal nerve.

- Rarely due to baby’s head pressing on lumbo-sacral nerves (“obstetric palsy”).

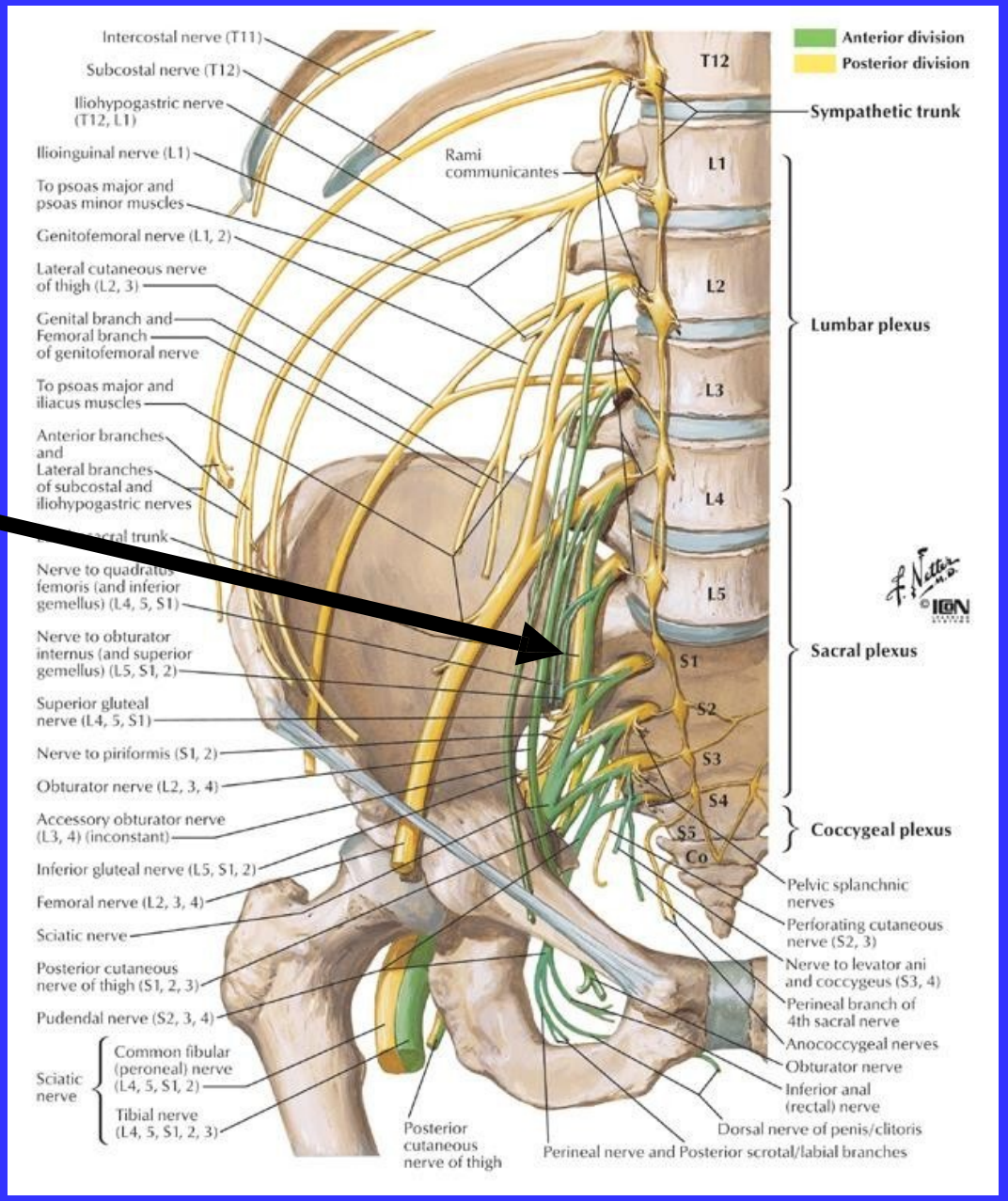
- Very rarely due to:
  - Direct needle trauma
  - Chemical nerve damage
  - Hematoma
  - Infection

Lower body neuro deficit after neuraxial anesthesia

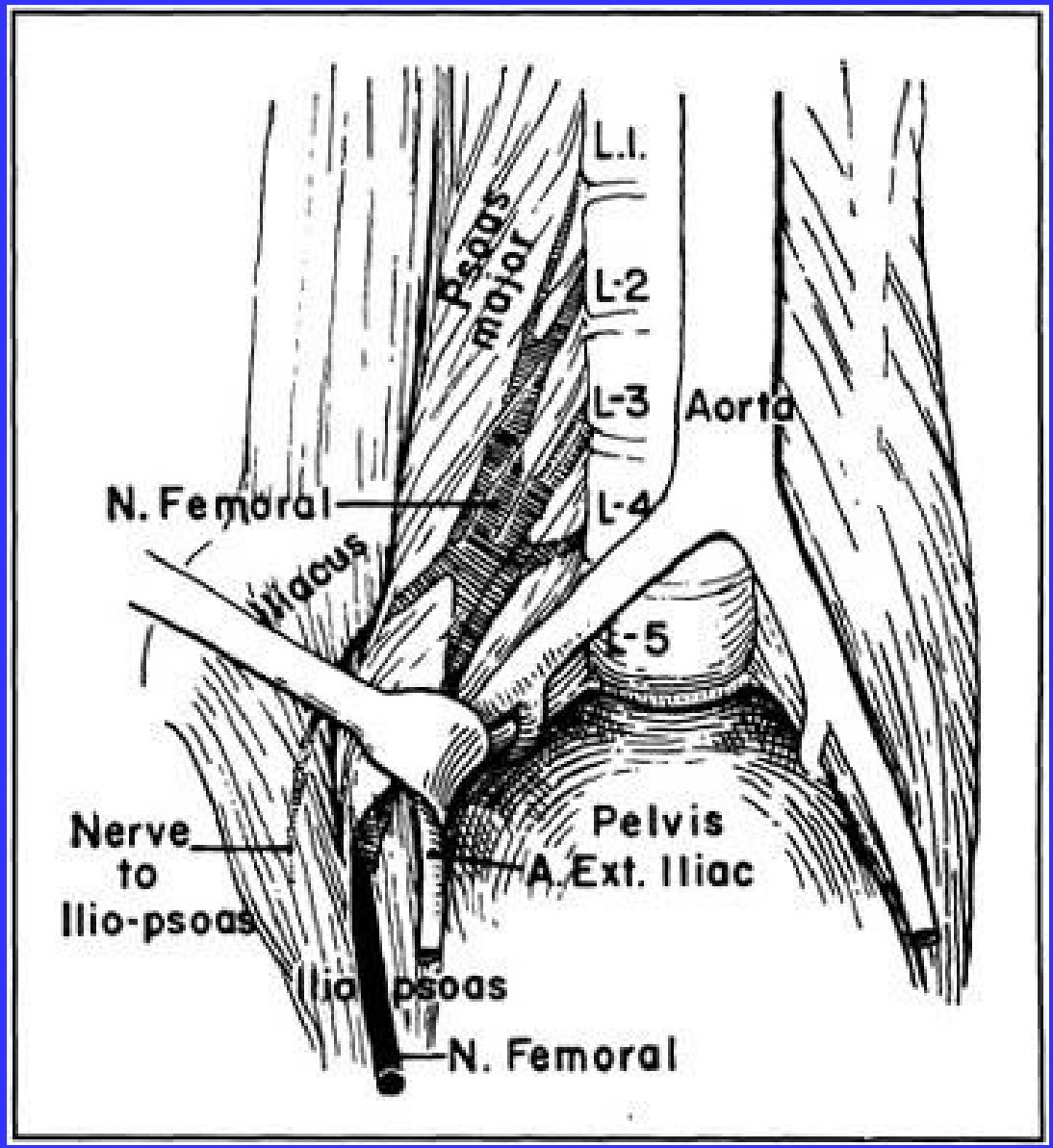
- If we are in the labor room, we should speak up if we think improper positioning could cause nerve stretch / pressure.

Baby's head can compress lumbosacral trunk at pelvic brim

Post-delivery deficit can be blamed on spinal or epidural.



Obstetrician ’s retractor can damage femoral nerve.



Other topics

Post dural puncture headache (PDPH, “spinal headache”)

- Frequency correlates with needle size
- Symmetrical frontal / occipital
- Postural
- Generally starts at least 24 hrs. after dural puncture (exception is BIG needle hole).
- Not all HA after delivery / spinal are PDPH.
- Oral caffeine, fluids, salt, analgesics
- Blood patch

Failed regional anesthesia

- Be honest with yourself– recognize failure.
- Move on to plan B (repeat block or do GA).

Basic C/S monitoring

- Talk with the patient!
- Does her face display anxiety?
- “Take a deep breath!”
- Have her squeeze your fingers
- What is her hand temperature?
- Are the hand veins dilated?
- “Do your hands feel normal or do they feel a little numb?”

C/S red flags

- “I don’t feel so good…I think I’m going to throw up…” (Hypotension until proven otherwise).
- “Doc, I feel like I’m not getting enough to breathe…”
- The “floppy arm sign.”
- The “shaking head sign.”

Anesthesia for C/S — Complications

- Sympathectomy / hypotension
- Nausea
- Bradycardia
- High spinal / respiratory paralysis
- Aspiration
- Difficult intubation
- Local anesthetic toxicity
- Failed regional anesthesia

High block– patient can't breathe

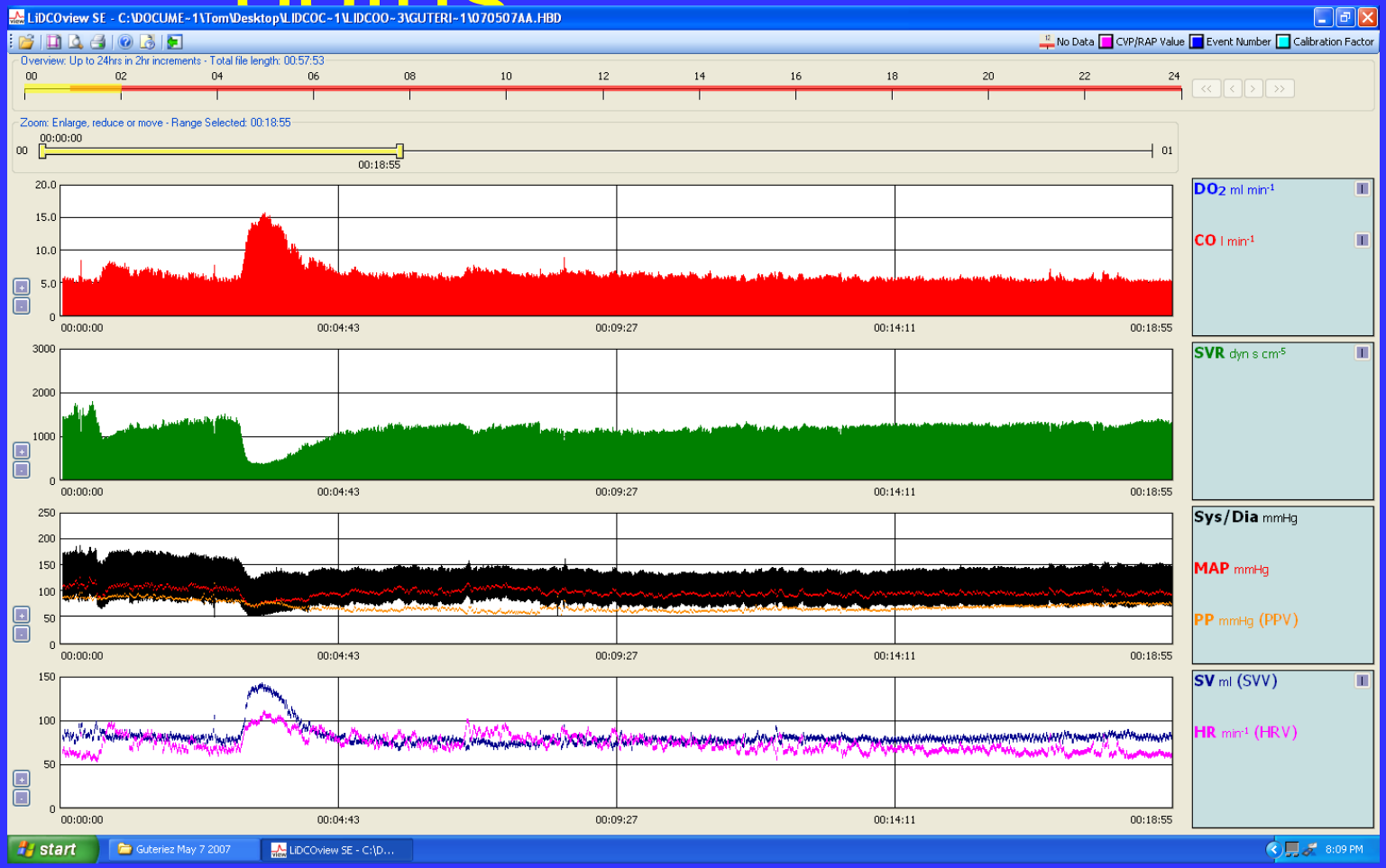
- Move to anesthesia mask and circle system early. Don't fuss around "assessing" the patient!
- Reassure patient, tell them this happens, and tell them you will help them breathe.
- You usually don't have to intubate.
- Sometimes patients will panic and shake head back and forth to get the mask off of their face.
- Assume accompanying hypotension. Give ephedrine or neo as you reach for the mask.

High block– patient can't breathe

- If patient becomes unresponsive, you probably should intubate– BUT VENTILATE FIRST AND DON'T PANIC.
- Assistant can give cricoid pressure– but VENTILATE, above all!
- May not need relaxant to intubate.
- Respiratory paralysis usually does not last long (5-15 minutes).

Bolus oxytocin can kill

Oxytocin 10 u bolus



Bolus oxytocin

- Drops the SVR drastically. Also dilates capacitance veins.
- If the CO can't increase markedly, MAP will fall drastically.
- Bolus oxytocin can kill women.
- Bolus oxytocin should probably not be used routinely.

Aspiration

- Not only during GA!
- Use “triple Rx” freely (on everybody?)
  - Beware with
    - High spinal
    - Heavy supplementation

Summary

- OB anesthesia– a unique environment for us anesthesiologists.

Tell us what the situation is and what you need (don’t try to dictate anesthetic technique).

Summary

- Spinal is best overall anesthetic for C/S.
- Indications and contraindications for GA, spinal and epidural.
- Physiology differs for spinal / epidural and GA.

Summary

Get us involved early.

Teamwork and mutual respect.

It’s a pleasure and an honor to work with you!

The
End