Common Indications for Caesarean Section

- Previous Cesarean Section
- Cephalopelvic Disproportion
- Failure of Induction
- Malpresentation
- Breech presentation
- Failed forceps delivery
- Hemorrhage
- Placenta Previa
- Toxemia
- Chorioamnionitis
- Herpes Genitalia
- Fetal Distress
- Chronic Utero-placental Insufficiency
- Rh Isoimmunization
- Prolapsed Cord
- Hypertonic Uterus

Fetal Heart Rate
Cesarean Delivery

- Choice of Anaesthesia
  - Spinal, Epidural, CSE, General
- Dependent on:
  - Reason for C/S
  - Desires of patient
  - Anaesthetist's judgement
    - Safest & most comfortable for patient
    - Least depressant to the newborn
    - Optimizes working conditions for the surgeon

"Regional anaesthesia is the standard of care for C/S"

Confidential Enquiries into Maternal Deaths

- UK has conducted reports covering 3 year periods since 1952
- Both in UK and internationally, the rise in regional anaesthesia and decline in G/A for C/S has seen dramatic reduction in anaesthesia related mortality

UK 2000-2002 Triennium

- 6 deaths (compared with 3 1997-99)
- All associated with GA
- Oesophageal intubation the cause of 3 deaths
- SHO-grade trainee without immediate senior backup all 3 cases
- Capnography not used in 2 of the 3 deaths!

But…..

- Recent Cochrane Review August '06
  - Meta analysis 16 studies (1586 women)
  - "No evidence to show RA superior to GA in terms of major maternal or neonatal outcomes"
  - Less nausea in GA group
  - Less blood loss in RA group
  - More women preferred to have GA for subsequent procedures compared with RA

Morbidity v Mortality

- Increased regionals and decreased GA has seen decline in mortality but increase in regional associated morbidity
- ASA closed claims files show choice of anaesthetic does not affect likelihood of malpractice litigation
- Should confidential reports be extended to include morbidity?
Spinal Contraindications

- **Absolute:**
  - Patient refusal
  - Severely impaired coagulation
  - Uncorrected hypovolaemia
  - Ongoing haemorrhage
  - Increased ICP
  - Infection at puncture site

- **Relative:**
  - Septicaemia
  - Certain cardiac conditions
  - Inability of pt to remain still
  - Uncooperative surgeon
  - Pre-existing neurological disease
  - Anatomical deformities pt’s back

Spinal Cardiovascular Effects

- **Sympatholysis:**
  - T5-L1 the major symp efferents affecting vascular tone
  - T1-T4 cardioaccelerator fibres
  - Splanchnic (and lower limb) venodilation with diminished VR/CO the major cause of hypotension
  - Arteriolar tone and SVR relatively well maintained healthy young adults (15% fall)
  - T1-T4 block leaves vagal tone to heart

Prophylactic Volume Loading

- Colloid may be more effective in preventing SNH
- Crystalloid should be given at time of spinal, not 15-20 mins before
- Little evidence volume loading improves maternal or fetal outcome in LCSC (as long as significant hypotension recognized and treated)
- Volume loading + lateral tilt can reduce hypotension from 85% to 50%

Vasopressors

- Obstetrics - ephedrine v alpha-agonists
- Original studies on pregnant sheep 1974 suggested uterine artery constriction with alpha agonists
- Recent studies umbilical pH worse with ephedrine than alphas
- Clinically little difference in outcome
- Ephedrine/Atropine if bradycardic
- Adrenaline
Prophylactic Vasopressors

- Phenylephrine 100ug/ml running @ 30-60 mls/hr as soon as spinal meds injected
- Warwick Ngan Kee (POWH Hong Kong)
- Claims dramatically reduces hypotension (>20% fall) from 50% with conservative measures (preload, lateral tilt)
- Maintaining BP within 10% baseline can reduce N&V to as low as 5%

A Recipe for a Spinal for C/S

- 1.8 (lying) - 2.5 (sitting) mls heavy bupivacaine 0.5%
- 20 microg fentanyl
- Morphine 100 - 150 microg if single shot or planning to remove CSE catheter at end of case
- For CSE, top up with 3 - 5 mls 2% lignocaine with adren (or 1% ropivicaine) if intrathecal dose does not produce a T5 block @ 8 minutes

EVE

- Epidural volume expansion
- External pressure on thecal sac increases cephalad spread of intrathecal block
- Used in CSE if necessary after spinal dose
- A factor in reports of high and total spinals after failed epidurals

Why Use Bupivacaine?

- Lignocaine too short acting
- Lignocaine carries high risk of TNS
- You can use ropivicaine (now licensed for intrathecal use), but its less cardiotoxic profile becomes irrelevant at intrathecal doses
- Everyone is used to bupivacaine

Why Heavy?

- Lowest level of thoracic kyphosis is at T5 (just where you want your block)
- In supine position (with tilt) this helps to limit cephalad migration of local

Why Add Fentanyl?

- Visceral nociception carried by C-fibres does not seem to be completely blocked by L/As
- Intrathecal opioids seem better at this
- Fentanyl is lipid soluble and rapid-acting (so good for surgery) BUT rapid in offset (so inadequate for post-op analgesia)
Post-op Analgesia

- If a single shot spinal or removing epidural catheter after CSE, 100-150 microg of I/T morphine produces excellent analgesia for 24 hrs with a low S/E profile
- At RHW most leave catheter in post-op for 48 hrs
- Then use PRN pethidine 25-50 mg Q2H (lower S/E profile than parenteral as per ANZCA EBM Pain Orange Book)
- Regular paracetamol, diclofenac supps

My Patient Already Has an Epidural and Now Requires Urgent C/S

- Assess urgency
- Go straight to Labour Ward if possible
- Assess block - has it been working or is it a dud?
- If in doubt pull it out and place a new CSE or single shot spinal
- A SSS in experienced hands is about as fast as a G/A

The Epidural is a Good’un

- That’s great, less work!
- BUT, a block on ice-testing on a Mum receiving 0.2% ropivicaine infusion, even to T5, just means your catheter is in the right place and Mum has good analgesia
- You will need to repaint the epidural space with a stronger solution to establish surgical anaesthesia
- You’ll need 10-25 mls 2% lignocaine with adrenaline or 1% ropivicaine

Epidurals & Back Pain

No link between back pain and epidurals
level 1 evidence
Back pain is common post-partum
up to 50% at 6 months.
No association between epidurals and long term back pain, movement disorders or disability
Most important predictor of post-partum back pain is presence of ante-partum back pain

Spinal and Epidural Haematoma

- Overall 1:220 000 for single shot spinals
- 1:150 000 for epidurals
- Know guidelines for pts on drugs acting on haemostatic system
- Pre-eclampsia - falling platelet count - need to weigh up risks

Post Dural Puncture Headache

- August Bier 1898 first described
- Pathophysiology - compensatory cerebral vasodilation
- Postural, bilateral, fronto-occipital
- May involve neck or upper shoulders
- N+V, visual disturbances, hearing loss
Management PDPH
- Consider DDx - headache common perioperatively
- Adequate hydration
- Caffeine
- Simple analgesics +/- opioids
- Anti-migraine Rx
- Bed rest
- Blood patch

Epidural Blood Patch
- Injection 15-20 mls blood into epidural space or until back, radicular pain
- Increases CSF pressure and seals hole
- Success rate 60-95%
- Early use (<24-48 hrs) diminishes success rate - controversial
- Prophylactic EDBP

Epidural Abscess
- Incidence from 1:3000 to 1:100 000
- Pyrexia usually but not always present
- Backache 72%
- Radicular pain 47%
- Sensory deficit 23%
- Weakness in an extremity 35%
- Bladder/bowel dysfunction 30%
- Paraplegia 21%

Testing the Block
- Light touch
- Ice or ethyl chloride spray
- Pinprick
- Surgeon

General Anaesthesia for Cesarean Section
- BE PREPARED!

G/A for C/S
- 2 patients!
- This is a 2 anaesthetist job if at all possible
Early anaesthetic consultation for parturients in whom emergency induction anaesthesia would be hazardous

- Antenatal clinic
- Labour ward

Preparation and planning
- Have a plan A, B and E
- Have all your equipment ready to deal with the worst
- Do not hesitate to institute invasive monitoring
- Rapid desaturation, especially if obese
- Sellick’s manoeuvre - gentle IPPV with O2 is OK prior to laryngoscopy and immediately reassures you she is capable of being mask ventilated

Patients die from hypoxia, not absence of an ETT
- Make your first laryngoscopy attempt your best
- Optimal sniffing position
- ETT loaded on stylet or bougie
- McCoy blade

Avoid multiple laryngoscopy attempts
- Do something different; don’t repeat unsuccessful techniques

If your judgement tells you that ventilation and oxygenation will be difficult, let alone intubation, then you must prepare, as quickly as possible, for an awake intubation
- This applies even in the most severe cases of fetal distress (this may be difficult for the mother and obstetrician to accept)
- In some cases, if the delay leads to loss of the fetus, this is preferable to loss of the mother and fetus

2001 Canadian Study (Brimacombe et al) prospective 1076 cases
- Elective healthy C-sections
- Demonstrated safe and effective
- No aspirations or other adverse events
- Reassuring if LMA required as a second line airway
The Tube Is In! What Next?

- 50:50 O2/N2O
- 0.5 - 1.0 MAC volatile
- Non-depolariser
- Post delivery, giving an opioid allows you to back off on the volatile to aid uterine contraction

OXYTOCIN

- UK 1997-99
- Confidential Enquiry Maternal Deaths
- Published 2001
- 2 deaths attributed to rapid 10 U boluses
- Subsequent survey, >85% anaesthetists no longer used > 5 U

Neonatal Resuscitation

- Know the ILCOR and APLS guidelines
- Call for help!
- Paediatrician may not be in attendance
- If resuscitating neonate, you must be sure your assistant can look after the mother, who is your primary patient

"Could You Give Another Shot of Synto?........"

- The atonic uterus can hose blood after delivery
- Get help and secure more large-bore IV access before the patient’s veins disappear due to shock
- Communicate with obstetrician and encourage them, in the nicest possible way, to seek assistance early
- Dealing with obstetric haemorrhage requires a lot of people to be effectively managed

Caesarean Delivery on Maternal Request

- The incidence of CDMR appears to be increasing. However, accurately assessing either its true incidence or trends over time is difficult because currently CDMR is neither a well-recognized clinical entity nor an accurately reported indication for diagnostic coding or reimbursement.