What’s New in Obstetric Anesthesia: 2013-14

The Key Papers Influencing Practice

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No Disclosures
Objectives

- Identify the primary causes of maternal and fetal morbidity and mortality that the anesthesiologist can impact.

- Make informed choices about the labor pain management techniques, concentration and delivery mode of medication, and technical aides for placement based on the current literature.

- Evaluate the risks and benefits of alternative post-cesarean delivery pain management strategies.
KEY TOPICS

Maternal

Fetal

Anesthetic
Obstetric Transition: The Pathway Towards Ending Preventable Maternal Deaths

Stage V

MMR <50 deaths/100,000 live births

Stage IV

MMR >299-50 deaths/100,000 live births

Stage III

MMR >999-300 deaths/100,000 live births

Stage II

MMR >1,000 deaths/100,000 live births

Stage I

MMR >500 deaths/100,000 live births

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Obstetric Transition: The Pathway Towards Ending Preventable Maternal Deaths

- There is still more work to be done
  - Worldwide threshold of <50 deaths per 100,000 live births (Stage IV) possible target for next Millennium Development Goals

- At MMR = 11.4 per 100,000 maternities and 17.8 per 100,000 live births, the UK and US are not yet at Stage V

Maternal Deaths Due to “Suboptimal Care”

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
<th>Reference</th>
</tr>
</thead>
</table>

* State based data

Standardized Severe Maternal Morbidity Review

- Standardized Post-hoc Reviews
  - MBRRACE-UK (Kurinczuk J, et al. BJOG. 2014, 121: 35-9)

- CROWN Initiatives (Khan, K. BJOG. 2014; 22: 1181–1182)

- “Big Data”
  - UKOSS (UK)
  - NIS (US)
“Recognizing Who is Sick”

<table>
<thead>
<tr>
<th>The Maternal Early Warning Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure (mm Hg): (&lt;90 \text{ or } &gt;160)</td>
</tr>
<tr>
<td>Diastolic blood pressure (mm Hg): (&gt;100)</td>
</tr>
<tr>
<td>Heart rate (beats per min): (&lt;50 \text{ or } &gt;120)</td>
</tr>
<tr>
<td>Respiratory rate (breaths per min): (&lt;10 \text{ or } &gt;30)</td>
</tr>
<tr>
<td>Oxygen saturation on room air, at sea level (%): (&lt;95)</td>
</tr>
<tr>
<td>Oliguria (mL/hr) for (\geq 2) hr: (&lt;35)</td>
</tr>
<tr>
<td>Maternal agitation, confusion, or unresponsiveness</td>
</tr>
<tr>
<td>Patient with preeclampsia reporting a non-remitting headache or shortness of breath</td>
</tr>
</tbody>
</table>

Ten Years of Confidential Enquiry Into Maternal Deaths

Retrospective Review
(French Confidential Enquiry Into Maternal Deaths):
- N = 660 maternal deaths
- 1998-2007
- No change in maternal mortality rate (~8/100,000 live births)

Identified Causes of Maternal Death

**Direct Causes**
- Hemorrhage
- Thromboembolism
- HDP
- Amniotic fluid embolism
- Early pregnancy death
- Infection
- PPCM
- Anesthesia complications

**Indirect Causes**
- Cardiovascular
- Cerebrovascular
- Other/Unknown
- Infectious disease
- Malignancy
- Respiratory disease
- Blood disease

Hemorrhage


Retrospective, Population-Based (NIS)

- N = 8.5 million hospital admissions

Results:

- Doubling of PPH from 1999 to 2008 (1.9/1,000 deliveries to 4.2/1,000 deliveries)
- Many expected risk factors present
  - Advanced maternal age, multiples gestation, cervical laceration, preeclampsia, cesarean delivery
- Changes in these risk factors accounted for only 5.6% of the PPH increases!

Postpartum Hemorrhage: Tools

Prospective Observational Study:
- N = 45 (MOH) and N = 49 (EBL < 600 mL)

Primary Outcome: Compare results of traditional coagulation parameters with TEG

### Traditional Lab Values

<table>
<thead>
<tr>
<th>Impaired haemostasis with EBL &gt; 2000 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fibrinogen = 39% decrease (P &lt; 0.0001)</td>
</tr>
<tr>
<td>• Antithrombin = 38% decrease (P &lt; 0.0001)</td>
</tr>
</tbody>
</table>

Correlation with EBL (r):
- Fibrinogen: = -0.77
- Antithrombin: = -0.78

Available in 60 min

### Thromboelastography (TEG) Parameters

<table>
<thead>
<tr>
<th>Impaired haemostasis with EBL &gt; 2000 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Clot stability and fibrinolysis were decreased</td>
</tr>
</tbody>
</table>

Correlation with EBL (r):
- TEG-MA: = -0.53

Available in 10-20 min

Best correlation between fibrinogen and TEG-MA (r = 0.7)

Postpartum Hemorrhage: Tools

Prospective Observational Study:
- N = 365 women with 1000-1500 mL PPH

Primary Outcome: Utility of Fibtem (measures fibrin clot strength after platelet inhibition) as biomarker for progression to severe PPH

Traditional Lab Values
- Fibrinogen (<2 g/L) highly predictive of progression to transfusion, prolonged hemorrhage, and longer stays in the high intensity unit
- Available in 60 min

Thromboelastometry (TEM) Rotem™
- Fibtem A5 (<10 mm) only independent predictor of progression to hemorrhage > 2500 mL: 0.85 (95% CI: 0.77-0.95)
  - Prolonged hemorrhage (median 127 vs. 65 min, p = 0.18)
  - Longer stay in high-dependency unit (23.5 vs. 10.8 hr, p = 0.001)
- Available in 5-10 min

PROPR
Pragmatic, Randomized Optimal Platelet and Plasma Ratios

woman
World Maternal Antifibrinolytic Trial
Simulation-Based Trial of Surgical Crisis Checklists

Simulation Study:
- N = 17 surgical teams in 106 simulated crisis

Primary Outcome:
- Failure to adhere to critical processes of care

Secondary Outcome:
- Perceived benefit

Simulation-Based Trial of Surgical Crisis Checklists

- Adjusted RR = 0.28 (95% CI: 0.18 - 0.42)
- 97% participants desired checklists in real-life event

** Denotes significance

Maternal Cardiac Arrest During Hospitalization for Delivery in the U.S.: 1998-2011

Background:
- PPH is the primary cause of cardiac arrest
- Paucity of research on frequency and maternal resuscitation

Retrospective analysis (NIS): N= 56,900,512 delivery hospitalizations

Results:
- Complicates 1/12,000 delivery hospitalizations, no temporal increases
  - Corroborates Scottish Confidential Audit of Severe Maternal Morbidity; 2003-11
- Other common causes are heart failure, amniotic fluid embolism, sepsis
- 59% survival to hospital discharge

Mhyre JM, et al. Anesthesiology. 2014; 120: 810-8
# SOAP Consensus Statement on the Management of Cardiac Arrest in Pregnancy

## Table 1. Checklist of Key Tasks During the First Minutes of In-House Maternal Cardiac Arrest

<table>
<thead>
<tr>
<th>Call for help!</th>
<th>A Airway</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Call “OB Code”</td>
<td></td>
</tr>
<tr>
<td>□ Use self-inflating bag mask</td>
<td></td>
</tr>
<tr>
<td>□ 100% O₂ at 10–15 L/min</td>
<td></td>
</tr>
<tr>
<td>□ Oral airway or</td>
<td></td>
</tr>
<tr>
<td>□ Experienced personnel: Intubation with 6–7.0 ETT or</td>
<td></td>
</tr>
<tr>
<td>□ Supraglottic airway (e.g., LMA)</td>
<td></td>
</tr>
<tr>
<td>□ Do not interrupt chest compressions!</td>
<td></td>
</tr>
<tr>
<td>□ If not intubated: 30 compressions to 2 breaths</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start CPR</th>
<th>B Breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Call neonatal team</td>
<td></td>
</tr>
<tr>
<td>□ AED/defibrillator</td>
<td></td>
</tr>
<tr>
<td>□ IMMEDIATE BLS</td>
<td></td>
</tr>
<tr>
<td>□ Adult code cart</td>
<td></td>
</tr>
<tr>
<td>□ Oxygen equipment</td>
<td></td>
</tr>
<tr>
<td>□ Backboard</td>
<td></td>
</tr>
<tr>
<td>□ Scalpel/Cesarean pack</td>
<td></td>
</tr>
<tr>
<td>□ Assign timer/documenter</td>
<td></td>
</tr>
<tr>
<td>□ Left uterine displacement (manual)</td>
<td></td>
</tr>
<tr>
<td>□ Hands mid-sternum</td>
<td></td>
</tr>
<tr>
<td>□ 100 compressions/min</td>
<td></td>
</tr>
<tr>
<td>□ PUSH HARD! PUSH FAST!</td>
<td></td>
</tr>
<tr>
<td>□ Change compressors every 2 min</td>
<td></td>
</tr>
<tr>
<td>□ Obtain IV access above diaphragm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C Circulation</th>
<th>D Defibrillate</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Chin lift/jaw thrust</td>
<td></td>
</tr>
<tr>
<td>□ 100% O₂ at 10–15 L/min</td>
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<table>
<thead>
<tr>
<th>E Extract FETUS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Prepare for delivery</td>
<td></td>
</tr>
<tr>
<td>□ Aim for incision by 4 min</td>
<td></td>
</tr>
<tr>
<td>□ Aim for fetal delivery by 5 min</td>
<td></td>
</tr>
</tbody>
</table>

**Left Uterine Displacement (Manual)**

**Extract Fetus: Aim For...**
- Incision by 4 min
- Fetal delivery by 5 min

Transport Decreases the Quality of Cardiopulmonary Resuscitation During Simulated Maternal Cardiac Arrest

RANDOMIZED SIMULATION STUDY:
- 26 teams, 2 providers

PRIMARY OUTCOME:
- % correctly delivered chest compressions

SECONDARY OUTCOME:
- Interruption in compressions, position of providers, ventilation tidal volume

Hypertensive Disorders of Pregnancy

Retrospective Review (CEMAC)
N= 347 in 21 million; 1979-2008

Prospective Cohort (Finland)
N>10,000; 40 years follow-up

Maternal Risks

1 in 7 Maternal Deaths Attributable to Stroke!


## Hypertensive Disorders of Pregnancy: Guidelines

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Early recognition?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Definition: Proteinuria?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Definition: Mild preeclampsia?</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Preventative therapy (ASA)?</td>
<td>High risk</td>
<td>High risk</td>
<td>Moderate risk</td>
</tr>
<tr>
<td>Treatment of moderate hypertension (&lt;160/110)?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Postpartum BP monitoring?</td>
<td>PPD# 1, 3, 7-10</td>
<td>PPD# 1, 3, 6</td>
<td>PPD# 1, 3, 5</td>
</tr>
</tbody>
</table>

Hypertension in Pregnancy: What Should We Do?

No superior antihypertensive agent  

- Choose a medication based on the clinician’s familiarity and experience
- Avoid nimodipine, diazoxide, ketanserin and MgSO$_4$ (for HTN)

Hypertensive Emergency  

- Oral nifedipine lowered BP more quickly than IV labetalol
  - No overshoot hypotension

Attenuation of Hypertensive Response to Laryngoscopy  

- ED95 remifentanil to attenuate hypertensive response to tracheal intubation = 1.34 mcg/kg
Maternal Sepsis Mortality and Morbidity During Hospitalization for Delivery

Retrospective, Population-Based (Nationwide Inpatient Sample):
- N = ~45 million deliveries
- 1998-2008

Results:
- SEPSIS COMPLICATED: 1 in 3,333 deliveries
- SEVERE SEPSIS: 1 in 10,823 deliveries
- SEPSIS-RELATED DEATH: 1 in 105,263 deliveries

Maternal Sepsis

- Pneumonia (29.7%)
- GU Infection (29.7%)
- Chorioamnionitis (18.4%)
- Endometritis (8.6%)
- E. Coli (26.7%)
- Staphylococcal (22.2%)
- Streptococcal (20.1%)

Maternal Sepsis Mortality and Morbidity

CHF 135 (93.6-194)
PPROM 2.5 (1.8-3.5)
Retained PoC 4.5 (2.8-7.8)
SLE 9.4 (5.2-16.7)
Multiple Gest 1.8 (1.2-2.5)

Population Attributable Risk Factor:

<table>
<thead>
<tr>
<th>CHF</th>
<th>PPROM</th>
<th>Retained PoC</th>
<th>SLE</th>
<th>Multiple Gest</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.9%</td>
<td>2.6%</td>
<td>1.5%</td>
<td>1.4%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

...Sepsis often occurs in the absence of identifiable risk factors

Anesthesia-Related Morbidity and Mortality
Failed Intubation in Obstetric Anesthesia: 2 Year National Case-Control Study in the UK (2008-10)

UK Obstetric Surveillance (UKOSS) Survey Data: N= 57 cases and 107 controls

Results: Incidence of “failed intubation” = 1/224

INDEX CASES
- LMA Rescue (39/57): 68%
- Emergency Surgical Airway (1/57): 2%
- Gastric Aspiration (4/57): 8%
- Maternal Comorbidities (8/57): 14%
- NICU (21/57): 37%

CONTROLS
- Neonatal Deaths (3/107): 3%

Serious Complications Related to Obstetric Anesthesia: SCORE (U.S; 2004-09)

Total Reports: 257,000

Serious Complications: 1:3,000

Most Frequent Complications:
- Failed intubation: 1:533
- High block: 1:4,336
- Respiratory arrest: 1:10,042
- Unrecognized spinal catheter: 1:15,435

What Can We Do To Prevent Maternal Morbidity?

- Retrospective study (N = 5,036), mean BMI = 34 kg/m²
- Spinal anesthesia with neuraxial morphine, oxycodone and/or Ibuprofen, prn
- No rapid response team or use of naloxone

**High Neuraxial Block** *(D’Angelo R, et al. Anesthesiology; 2014: 120: 1505-12)*
- Mostly occurs with spinal after failed epidural: Use discretion

- Comparison of 2 test doses; 2 vs. 3 mL lidocaine 1.5% with epinephrine
- Wait 3 minutes!
Ultrasound Estimates for Midline Epidural Punctures in the Obese Parturient

**Intervention:**
- N = 60 obese women

**Primary Outcome:**
- Precision of estimated depth to the ligamentum flavum

Ultrasound Estimates for Midline Epidural Punctures in the Obese Parturient

Paramedian Sagittal Oblique (PSO)  Transverse Median (TM)

Image Quality: 86.7%  Image Quality: 68%

Ultrasound Imaging for Lumbar Punctures and Epidural Catheterizations

Meta-Analysis (14 RCTs):
- 5 lumbar punctures and 9 epidural
- N = 1,334 (674 US)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Effect of US vs. Control (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Failed Procedures</td>
<td>Relative Risk = 0.2 (0.1 to 0.4)</td>
</tr>
<tr>
<td># of Traumatic Procedures</td>
<td>Relative Risk = 0.3 (0.1 to 0.7)</td>
</tr>
<tr>
<td># of Insertion Attempts</td>
<td>Mean Difference = -0.4 (-0.6 to -0.2)</td>
</tr>
<tr>
<td># of Needle Redirections</td>
<td>Mean Difference = -1.0 (-1.2 to -0.8)</td>
</tr>
</tbody>
</table>

Prevention of Postdural Puncture Headache


**Expert Review OF 10 RCTs:** N = 1,611 adults and children
- Not appropriate for meta-analysis

**Results:**
- IV Cosyntropin (1 mg)
- Neuraxial morphine (side effects)
- IV Aminophylline (restricted population)
- IV Dexathethasone (ineffective)


**RCT:** N = 60 (prophylatic EBP) and N = 56 (conservative Rx)

**Results:**
- **18.3%** with prophylactic vs. **79.6%** with therapeutic EBP developed PDPH
- No differences in need for second EBP
Epidural Failure Rate Using a Standardized Definition

Delphi Technique

- Inadequate analgesia @ 45 min
- Resite/abandoned
- Accidental dural puncture
- Patient dissatisfied in follow-up

Epidural Failure Rate Using a Standardized Definition

Results:

- 23% of epidurals “failed” (mostly commonly, inadequate pain relief)
- Lowest failure rates associated with:
  - Placement by Year > 5
  - Catheter insertion 5-6 cm
- No difference with:
  - Time of day
  - Duration of labor / cervical dilation
  - Patient position

Pain vs. Comfort Scores After Cesarean Section: A Randomized Trial

RCT:
- N = 337

Primary Outcome:
- Degree of bother and additional pain relief

Pain vs. Comfort Scores After Cesarean Section: A Randomized Trial

Results:

- Lower scores for inverted comfort than for pain
- Approximately equal numbers reported pain when asked about “pain”
- “Pain” Group rated post-op sensations as “unpleasant”, “bothersome”; perceived “tissue damage” and “injury” vs. “healing” and “recovery”

KEY TOPICS

Maternal

Fetal

Anesthetic
Periconceptional Use of Opioids

**Retrospective Case-Control Study:**
- N = 305 (neural tube defects); N = 7,125 (nonmalformed controls);
  - N = 13,405 (malformed controls)

**Results:**

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Case Group</th>
<th>Non-Malformed Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Any Opioids</strong></td>
<td>% (N)</td>
<td>% (N)</td>
</tr>
<tr>
<td>All Neural Tube Defects</td>
<td>3.9 (12)</td>
<td>1.61 (114)</td>
</tr>
</tbody>
</table>

**Adjusted OR (95% CI):** 2.2 (1.2-4.2)

Impact of Temperature on Fetus

High (≥38⁰ C)
- Maternal antibiotics and neonatal sepsis work-ups
- Association of fever with neonatal encephalopathy
  - 1.13% vs. 0.12% rate in infants born to febrile vs. afebrile low-risk mothers

Low (<36.5⁰ C)
- Increased risk of death
  - Mortality risk increased by ~80% for every 1⁰ C decrease in first observed axillary temperature
  - RR of death 2-30X for moderate to severe hypothermia

Effects of Antibiotic Prophylaxis on Epidural-Related Fever

RCT:
- N = 200 (cefoxitin) and N = 200 (placebo)

Results: Negative Study
- No difference in fever rates in antibiotic (38%) vs. placebo group (40%)
- No differences in neonatal outcomes
- Fever more frequent in women with placental neutrophilic inflammation (risk difference: 23%, P<0.001)

Conclusions:
- Intrapartum fever does not have an infectious etiology

Sharma, SK et al. Anesth Analg 2014; 118: 604-10
The Incidence and Prevention of Hypothermia in Newborn Bonding after Cesarean Delivery

**RCT:** N = 40 women

**Primary Outcome:** Difference in newborn hypothermia

**Results:**

- Without active warming:
  - 81% incidence of newborn hypothermia
- Active skin-surface warming:
  - 5% incidence of newborn hypothermia (P < 0.0001)
  - Decreased maternal shivering (0% vs. 24%, P < 0.0001)
  - Increased maternal thermal comfort (-9 vs. 7, P < 0.0001; -50 to 50 mm VAS)

Effects of Epidural/Spinal Opioids in Labor Analgesia on Neonatal Outcomes

Meta-analysis of 21 RCTs:
- Epidural/spinal opioids (morphine, fentanyl, sufentanil, alfentanil or remifentanil) combined with local anesthetic compared with only local anesthetic only

Results:
- No differences in umbilical cord artery pH ($I^2 = 80\%$)
- No differences in Apgar score <7 at 1 min or 5 min ($I^2 = 0\%$)
- No differences in Neurological and Adaptive Capacity Scores at 2 hr ($I^2 = 0\text{-}3\%$)

Hot Topics in Obstetric Anaesthesia | OAA 2014

KEY TOPICS

Maternal

Fetal

Anesthetic
A Randomized Controlled Comparison of Epidural Analgesia and Combined Spinal-Epidural Analgesia

RCT:
- N = 398 (epidural) and N = 402 (CSE)

Primary Outcome:
- Pain at end of first stage of labor and shortly after delivery

Secondary Outcomes:
- PCEA use; number of supplemental top-ups; epidural catheter replacements; side effects; labor outcomes

IS CSE Better Than Epidural for Labor?

Lower pain scores in 1st stage*  
(mean: 1.4 vs. 1.9; \( P < 0.001 \))  
Fewer anesthesiologist top-ups

More (transient) fetal bradycardia

More side effects (itching)

Comparison of Variable Frequency Automated Mandatory Boluses with Basal Infusion for PCEA During Labor and Delivery

RCT:
- N = 102

Primary Outcome:
- Incidence of breakthrough pain requiring supplementation by anesthesiologist

Variable Frequency, Automated Mandatory Boluses with a Basal Infusion for PCEA During Labor

- Analgesic efficacy
- Satisfaction
- Rate of machine delivered boluses (fully dilated)

Local anesthetic consumption overall equal

- Anesthesiologist Top-Ups: 5.9% vs. 23.5%*

Nitrous Oxide for Labor

- Properties of anxiolysis, decreased perception of pain (unmeasured)
  - Inexpensive
  - Non-invasive
  - Quick on- and off-set
  - Preserves Mobility
  - No difference in Apgar scores

- Less effective pain relief than epidural
  - *Poor quality evidence*
  - No difference in pain relief from placebo
  - Side effects (e.g. nausea)
    - *Moderate quality evidence*

*Need better patient satisfaction measures!*

Remifentanil for Labor Analgesia

RCT, non blinded inferiority trial
- N = 19 (remifentanil PCA: 20-60 mcg) and N = 20 (PCEA)

Primary Outcome:
- Efficacy and maternal satisfaction (11-point scales)

Secondary Outcome: Safety

Results:
- Pain @ 30 min: Remifentanil (3.7 ± 2.8) > epidural (1.5 ± 2.2) (P = 0.009)
  - Mean difference > -1.5 units for remifentanil (30 min-6 hr)
- Maternal satisfaction: Remifentanil (8.6 ± 1.4) < epidural (9.1 ± 1.5), not statistically significant
- 27 apnea events in 5 women receiving remifentanil!
- No difference in fetal outcomes

Cesarean: Is One Technique Better than Others?
Comparison of the Effects of Low-Dose Spinal or GA on Umbilical Cord Blood Gases During Cesarean Delivery of Growth Restricted Fetuses

Prospective RCT:
- N = 40

Primary Outcome:
- Umbilical cord blood base deficit

Secondary Outcome:
- Neonatal outcome and maternal hemodynamic parameters

Low Dose Spinal vs. General Anesthesia

- Cord pH: 7.23 ± 0.06 vs. 7.27 ± 0.04 (p = 0.01)
  Two neonates with cord PH < 7.1
- More hypotension: 0.7 + 1.1 min (p = 0.019)

No difference in base deficit*

- Higher PaO_{2}
- More resuscitation

Comparison Between CSE and Single Shot Spinal Techniques in Morbidly Obese Patients Undergoing Cesarean Delivery

**RCT:**
- N = 21 (SSS group) and N = 20 (CSE group)

**Results:**
- No statistically significant differences in median procedure time
  - Procedure completed in <10 min for majority of both groups
- More attempts for successful completion for SSS group (3; 95% CI: +1 to +6; P = 0.007)

Variable Rate Phenylephrine Infusion with Rescue Phenylephrine Boluses vs. Rescue Boluses Alone in Cesarean Delivery

**Prospective RCT:** N = 80 (spinal anesthesia)
- Crystalloid coload + prophylactic variable rate infusion (50 μg/min if 75 kg, or 0.75 μg/kg/min) or normal saline + rescue phenylephrine boluses

**Primary Outcome:**
- Physician interventions (target SBP within 20% baseline)

**Secondary Outcomes:**
- BP, HR, nausea/vomiting, and neonatal outcomes

Variable Rate Phenylephrine Infusion with Rescue Phenylephrine Boluses vs. Rescue Boluses Alone in Cesarean Delivery

TAP Blocks Do Not Improve Early/Late Pain Outcomes after Cesarean Delivery

RCT:
- N = 42 (saline placebo) and N = 41 (0.25% ropivacaine; 20 mL)

Primary Outcomes:
- Pain at rest and movement (NRS), “Quality of Recovery” questionnaire (QoR-40), opioid consumption at 24 hr

Results:
- No differences between groups regarding pain, QoR-40, or opioid consumption

http://pie.med.utoronto.ca/OBAesthesia/OBAesthesia_content/assets/images/blocks/tap4.jpg
Symptomatic Local Anesthetic Toxicity and Plasma Ropivacaine Concentrations After TAP Block for Cesarean Delivery

**Observational Study:** N = 30; TAP Block: ropivacaine: 2.5 mg/kg

**Primary and Secondary Outcomes:**
- Serum ropivacaine concentrations (10-240 min)
- Symptoms of local anesthetic toxicity

**Results:**
- TAP blocks can result in elevated plasma ropivacaine concentrations (>2.2 mcg/ml)

➔ **Future studies:** Posterior TAP block may produce longer analgesia than the lateral TAP block!

Continuous Wound Infiltration with Ropivacaine for Analgesia after Cesarean Section

Double Blinded RCT: N=67
- 0.75% ropivacaine or saline placebo

Primary Outcome:
- Total amount of rescue oxycodone 48 hr post-op

Second Outcomes:
- Pain and patient satisfaction scores

Conclusion:
- No impact on opioid needs, pain scores or patient satisfaction

Summary

- The key is knowing who is sick

- We, the obstetric anesthesiologists, can have a dramatic impact on maternal and fetal outcomes

- Obstetric anesthesia continues to become safer and more elegant