Management of Post Spinal Hypotension in Patients Undergoing Caesarean Section

Objectives
The management of post spinal hypotension in patients undergoing Caesarean section.

Patients covered
All patients undergoing spinal or combined spinal/epidural anaesthesia for Caesarean section.

Target users
Anaesthetists.

Clinical document recommendations (including different options for the management of condition) (please use flow charts where possible as they are easier to read)

1. There is a high incidence of post spinal hypotension (50-80%) in patients having Caesarean sections. Maternal side effects of hypotension include nausea, vomiting and cardiovascular collapse. Neonatal side effects of hypotension may include acidosis and depression (1,2).

2. Post spinal hypotension is usually treated by rapid infusion of fluid (3,4) and use of vasopressors. **N.B. Guidelines differ for patients with pre-eclampsia/eclampsia.** Other management strategies include uterine displacement, use of leg compressors and modifying the anaesthetic technique e.g. altering the dose/volume of local anaesthetic.

3. Recent evidence has shown that pre-loading or co-loading with colloid e.g. 500ml Hetastarch, results in lower incidence and severity of maternal hypotension than traditional preloading with crystalloid solutions, a lower heart rate, decreased ephedrine requirements and less nausea and vomiting (5) (6). Larger amounts of crystalloid result in no difference in hypotension, cardiac index, SVR, MAP or ephedrine use and results in a lower colloid oncotic pressure. (7).

4. Colloid loading at induction of spinal anaesthesia for Caesarean section is as effective in reducing hypotension as preloading (8).

5. A recent systematic review of ephedrine vs phenylephrine for spinal hypotension during Caesarean delivery has shown advantages of phenylephrine over ephedrine including, easier to titrate, more effective, less maternal tachycardia and hypertension and more
favourable fetal pH and base excess. Phenylephrine may cause more maternal bradycardia but **phenylephrine is now considered the vasopressor of choice in the Obstetric setting.** (6).

6. Phenylephrine may be used at 100microgram boluses titrated against blood pressure or as an infusion of 100 micrograms/minute commenced after the spinal anaesthetic has been sited. Phenylephrine infusion has been found to be preferable to boluses because there is a lower incidence and magnitude of hypotension, a trend towards less nausea (4% vs. 21%) and a slower heart rate. Although there is a larger total dose with infusion compared to boluses of phenylephrine, umbilical cord gases and Apgars are similar. (9).

7. An infusion of phenylephrine 100microgram/ml should be prepared prior to all elective Caesarean sections by diluting 5mg in 50mls of Normal Saline. It should be connected via a Y connector to the patient’s intravenous line commencing at 20-30 ml/hour (up to 60ml/hour, i.e., 100 microgram/min), to maintain blood pressure at >90% pre block systolic.

The infusion rate should be reduced then stopped following delivery of the baby, Bradycardias can be treated with glycopyrrolate. Phenylephrine boluses of 100micrograms may be used. (10).

8. **In summary in the healthy parturient to prevent post spinal hypotension;**

- Preloading or co-loading with colloid in the obstetric patient having spinal anaesthesia is better than crystalloid preloading.
- Left uterine displacement and compression stockings should be used.
- Phenylephrine is the vasopressor of choice, boluses may be used, an infusion is preferable to boluses in the elective patient. (6).

**Auditable Standards**

Incidence of post spinal hypotension in elective Caesarian section patients.

**System for Audit / Monitoring, Review of Results and Monitoring of Action Plans**

Audits in place.

**Supporting evidence / references (recommendations should be supported with a list of references on which they are based unless they are based on national guidelines etc in which case this should be specified).**

Authors (including a list of others involved in the clinical document development)
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List of those consulted about the document
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Part 2

(This part of the template is designed to ensure that the document is successfully implemented but will not be distributed to users.)

Implementation strategy

Added to Intranet guidelines site and distributed by email to all members of the Anaesthetic department.

Costs

Are there any **additional** costs associated with the implementation of the clinical document?

[ ] Yes  [ ] No

If yes please complete the table below

Consider: Pay costs, such as staff hours; non pay costs, such as medicines, equipment and consumables such as dressings.

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Further comments:

Has the directorate agreed to fund the costs identified?

[ ] Yes  [ ] No

Signed:                                          Name:

(On behalf of the clinical directorate)

(Acknowledging the costs associated with implementation)

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Search Criteria (This part of the template is designed to ensure that people will be able to search and find your document once it is published on the Intranet. It will be removed prior to publishing).

Keywords: (Please list as many words as possible that will help people find your document).

Obstetric anaesthesia, spinal, hypotension, co-loading, Phenylephrine.
**Clinical Document Title**  
Management of Post Spinal Hypotension in Patients Undergoing Caesarean Section

**Date of Development**  
September 2009

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Author(s) confirm that they have collected all the signatures, as listed above, and posted to Clinical Governance Development Unit, Corridor F, Grantham Hospital.

**Chair of Clinical Effectiveness Steering Committee**  
Jim Campbell

* Signed at CESC meeting following ratification / approval.
Developing a Clinical Document

Need for local clinical document has been identified.

Is national guidance available?

Yes

Develop clinical document using national guidance.

No

Develop clinical document using a systematic approach.
- Literature searching.
- Criteria for including / excluding the evidence.
- Methods for formulating recommendations.
- Assessing health benefits risks and side effects.

Clinical document should be developed for Trust-wide use wherever possible using the Trust template.

Include all relevant health professionals ensuring a senior pharmacist is consulted if the clinical document contains drugs.

Liaise with Consultant Microbiologists if clinical document refers to antibiotics.

Circulate for comment to relevant workstreams.

Send clinical document to Clinical Governance Development Unit for appraisal* and forwarding to the Drugs and Therapeutics Committee and Clinical Effectiveness Steering Committee meetings as appropriate.

Ratified for use?

Yes

Authors should note that:
- Documents must be reviewed within 3 months of review date.
- Each specialty is required to audit and review 5 guidelines per year as stated in the Trust Audit Forward Programme.

No

Clinical document is published on the Intranet (review dates are flagged in red on Intranet and document will be removed 3 months after this).

Return to authors with comments.

* If, following appraisal, there is a reason why the clinical document cannot be reported to the CESC straightaway, the author will be contacted by CGDU staff. 3 e-mail reminders will be sent if necessary, but if the issue is not resolved within a 3 month timeframe the author will need to re-submit the clinical document.