
Fetal Monitoring During Non-obstetric Surgery

Anesthesia Protocol

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Department of Anesthesiology

Overview

Rationale

- Confusion among anesthesia staff regarding need for fetal monitoring
- Variable practices among anesthesia, obstetric and surgical staff regarding implementation of fetal monitoring.
- Lack of a standard procedure for obtaining fetal monitoring when a need for monitoring has been determined
- Desirability from a quality assurance perspective to have a standardized policy for fetal monitoring

Purpose of Intra-operative Fetal Monitoring

- To provide continual assessment of fetal well-being.
 - 1) In order to identify anesthetic (pharmacological & physiological) factors which adversely affect fetal well-being
 - 2) In order to identify surgical maneuvers (positioning, retraction etc) which adversely affect fetal well-being.
- To provide documentation, for medicolegal reasons, of fetal viability and well-being during surgical procedures.

Review of the Literature

- “the decision to use fetal monitoring should be individualized, and, if used, may be based on gestational age, type of surgery, and facilities available.” (1)
- “monitoring may allow rapid improvement of the fetal status or uterine activity when early compromise or contractions are detected.” (2)
- “other advantages included the ability to use FHR responses as early signs of compromised maternal physiology” (2)
- “the advantages of assessing FHR in a nonviable fetus are similar to those... for a viable fetus.” (2)
- “technical problems may limit the use of continuous FHR monitoring between 18 and 22 weeks’ gestation.” (3)
- “persistent severe fetal bradycardia typically indicates true fetal distress.” (3)
- “ideally, continuous fetal heart rate monitoring during surgery should be employed after the 16th week of gestation. This may provide an indication of abnormalities in maternal ventilation or uterine perfusion.” (4)

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Policy

- 1) When possible, all patients should have a pre-op Obstetric consult.
- 2) The surgeon booking the case must inform Scheduling to flag pregnant patients (including gestational age) on the schedule & on the OR board.
- 3) An experienced obstetric provider, who can interpret the results, should perform all FHR/uterine monitoring.
 - Call Labor & Delivery (tel #:84616) to arrange for an OB nurse to be available for FHR monitoring if necessary.
- 4) Inform the on-call OB team when the case is starting. They are available for advice and should be involved in management of the mother and fetus perioperatively.
- 5) Fetal monitoring as follows:
 - **16 – 20 weeks gestation:** FHR should be monitored and documented pre and postoperatively, if technically possible.
 - **20 – 24 weeks:** FHR should be monitored and documented preoperatively, continuously intraoperatively, if technically possible, and for a period postoperatively.
 - **24 weeks onwards:** FHR and uterine activity should be monitored and documented preoperatively, continuously intraoperatively, and for a period postoperatively.

(A sterile sleeve is available for direct uterine monitoring during intra-abdominal surgery.)
- 6) Post-op, the patient should initially go to PACU with fetal monitoring, and then to 6 South (L & D) for continued fetal monitoring, if necessary.

NB

- 1) Give sodium citrate & do a RSI if giving a GA > 16wks gestation
- 2) Remember the LEFT Lateral TILT/Wedge > 20wks gestation
- 3) ALL anesthesia drugs are safe during pregnancy

Action and Reaction

- Baseline FHR is usually 120 – 150 bpm
Under general anesthesia the baseline may decrease by 10 bpm
- FHR variability is present by 25 – 27 weeks gestation
Variability is typically decreased or absent under general anesthesia
- For a slow or sudden decrease in FHR < 100bpm for more than 30 seconds:
Page the on-call Obstetrician for advice / help AND...

ACTION	REACTION
Increase maternal left lateral tilt	Minimizes aortocaval compression
Check surgeons not compromising uterine perfusion with retractors, external pressure or high laparoscopic pressures	Improves of uterine perfusion once pressure relieved
Increase maternal FiO ₂	Improves fetal oxygenation
Alter maternal ventilation (pCO ₂ > 35 mmHg)	Improves oxygen transfer to fetus
Increase maternal blood pressure (iv fluids +/- ephedrine)	Improves uterine perfusion
Check maternal acid-base status	Directly affects fetal acid-base status

References:

- 1) ACOG committee opinion: Non-obstetric surgery in pregnancy. *Int J Gynec. & Obstetrics* 83 (2003) 135.
- 2) Inturrisi M: Perioperative Assessment of Fetal Heart Rate and Uterine Activity. *J Obstet Gynecol Neonatal Nurs.* 2000 May-Jun; 331-6.
- 3) Cohen SE: Non-obstetric Surgery During Pregnancy, in Chestnuts *Obstetric Anesthesia, Principles and Practice.* Second Edition. Mosby p 279 1999.
- 4) Levinson G: Anesthesia for Surgery during Pregnancy, in Shnider And Levinson's *Anesthesia for Obstetrics.* Fourth Edition. Lippincott Williams and Wilkins. P 249 2002.