Subject: Fetal Monitoring

Purpose: To establish guidelines on Fetal Monitoring and define interpretation of contraction status and fetal response to labor.

Policy: An RN will utilize a fetal monitor to assess the labor of a woman and the status of her unborn child. Fetal vital signs are done on every patient presenting to labor or for a scheduled C-section. A 20-30 minute external monitoring strip will be done to evaluate and establish a FHR baseline.

Special Information:
1. OB trace-vue will be used when possible for archiving fetal heart tracings.
2. Before beginning external monitoring, assist the patient to be as comfortable as possible and empty her bladder. Generally, the optimal position for FHR signal is with the patient in the semi-Fowler’s position or left lateral recumbent position. Avoid the supine position.
3. Fetal monitoring is done on every patient in the second stage of labor either by external or internal modes or by intermittent auscultation at five minute intervals with a doptone.
4. The nurse may implement and continue external fetal monitoring as her clinical judgement dictates.
5. Continuous fetal monitoring is done with induction or augmentation of labors with Oxytocin, Oxytocin Challenge Tests, and all prostaglandin preparations.
6. If non-reassuring fetal heart rate pattern is identified, the nurse is responsible for initiating appropriate nursing interventions as indicated by the pattern identified and notifying physician.
7. Membranes must be ruptured for internal monitoring.
8. Internal monitoring contraindicated in HIV-positive women.
9. A 15 bpm by 15 second acceleration indicates the absence of a metabolically acidolic fetus at that time.

Equipment:

Basic fetal monitor

External: Ultrasound transducer
Tocodynamometer
Elastic monitor belts (disposable)
Gel

Internal: Spiral electrode, ECG attachment pad and cable
Intrauterine pressure catheter (IUPC) and cable

Optional: SpO₂ cable
Marker cable
Sphygmomanometer (NIBP)
Procedure for External Monitoring:
1. Identify patient using 2 identifiers.
   Explain procedure to patient prior to application of fetal monitor.
2. Place elastic straps under patient’s back and position patient for comfort in semi-fowlers or side-lying.
3. Place gel on the face of the ultrasound transducer and turn monitor on. Connect cables to sockets.
4. Place U.S. transducer on maternal abdomen over area where fetal heartbeat is best heard.
4. Fasten elastic strap - adjust as necessary for consistent tracing.
5. Position toco transducer at uterine fundus and fasten strap.
5. Adjust as necessary for consistent tracing. Calibrate toco monitor when patient not having a contraction “20” will display.

Procedure for Internal Monitoring:
1. Assist physician with amniotomy if necessary. Note color, amount, odor and FHR. Explain internal monitors to patient.
1. Leave external US on to monitor FHR. Encourage patient to relax.
2. Attach IUPC Catheter to cable. Place cable into toco port and "zero" to calibrate prior to physician placing the IUPC utilizing aseptic technique.
2. Explain procedure to patient prior to initiation of internal monitoring.
3. Assist physician in placing the scalp electrode (a nurse competent in applying scalp electrode may also apply).
3. Fetal heart rate will display and record on the tracing.
4. Attach scalp electrode to leg attachment and to cable and monitor. Secure IUP catheter to patient’s thigh using attachment pad.

Rezeroing IUPC:
1. Disconnect catheter from cable. The IUPC should never read negative numbers of MMHg.
2. Press toco button.
3. Reconnect catheter to cable.

Content:
1. Note baseline fetal heart rate (FHR).
2. Assess for accelerations and periodic changes in FHR (see definition):
   Early Decelerations  Variable Decelerations
   Late Decelerations  Prolonged Bradycardia
3. Note long term and short term variability.
4. Assess normal reassuring patterns:
   * Baseline 110-160 bpm
   * presence of variability
   * periodic changes of accelerations with fetal movement
   * early decelerations and mild variable decelerations
* Normal uterine activity patterns: Contractions are every 2 minutes or greater in frequency, 90 seconds or less in duration, and less than 100 mm Hg, in intensity
* resting tones are 30 seconds or more between contractions and the uterus palpates soft between contractions

**Definitions:**

1. **ACCELERATION:**
   When the FHR increases 10-15 bpm above baseline. An acceleration indicates fetal well-being when the amplitude is more than 15bpm and the duration of the acceleration is more than 15 seconds. If the fetus is less than 32 weeks gestation, acceleration parameters are 10 bpm x 10 seconds.

2. **VARIABILITY**
   Defined as fluctuations in the fetal heart rate baseline that are two cycles per minute or more and that are irregular in amplitude.
   - **ABSENT VARIABILITY:** undetected amplitude range.
   - **MINIMAL VARIABILITY:** amplitude > undetectable be ≤ 5 bpm.
   - **MODERATE VARIABILITY:** amplitude 6-25 bpm
   - **MARKED VARIABILITY:** amplitude > 25 bpm.

3. **EARLY DECELERATION:**
   Early decelerations are uniform in shape with a characteristic gradual onset and gradual return to baseline. They begin early in the contraction cycle and return to baseline by the end of the contraction. Rarely do these decelerations fall outside the normal baseline range.

   They are caused by fetal head compression, resulting in alteration of cerebral blood flow, and vagal nerve stimulation. Fetal Heart Rate Variability and rate should remain normal. These decelerations are generally seen during the active phase of labor. This is usually a benign pattern requiring NO INTERVENTIONS.

4. **VARIABLE DECELERATION:**
   Variable decelerations are appropriately named, as their shape, timing, and duration vary. They are probably the most common FHR deceleration seen during labor and are caused by compression of the umbilical cord. They are characteristically very abrupt in onset with a rapid drop from and return to the established baseline. The depth varies considerably yet most often is below normal fetal heart rate range. These decelerations may begin and end at any time during the contraction cycle, though their offset is usually by the end of the contraction. Abrupt decrease in FHR of ≥ 15 bpm lasting ≥ 15 seconds but < 2 minutes.

   Fetal tolerance of this insult may be evaluated by several parameters. Some clinicians rely on the “grading” of variable decelerations as mild, moderate or severe in order to indicate the degree of fetal stress. Though there is no consensus regarding the characteristics of each of these categories, its is generally felt that the shorter the duration, the more rapid the return to baseline, and the presence of “shoulders,” all represent “mild” forms of variable deceleration. As the cord compression worsens resulting in fetal hypoxia, decelerations become longer and may have more gradual return to baseline. Variability and baseline rate should also be assessed for evaluating fetal tolerance.
Treatment for severe variables:
1) check for prolapsed cord. If present leave hand positioned on fetal head to relieve compression cord and call for assistance, prepare for emergency stat c-section
2) stop pitocin if used
3) position changes, including knee-chest position
4) give 100% O₂ by rebreather mask - 10-12 L/min
5) bolus of IV fluid - LR
6) consider terbutaline

5. LATE DECELERATION
Late decelerations are uniform in shape with a gradual onset and gradual return to baseline. They begin late in the contraction cycle, close to the peak, and return to baseline after the contraction has ended. They may be subtle, smooth decelerations and usually drop no more than two to five beats per minute below the established baseline. Late decelerations represent fetal hypoxia and are caused by inadequate uteroplacental blood flow. Nursing interventions are necessary for respective base decelerations (onset to nadir 30 seconds or more).

Treatment for late decelerations:
1) O₂ @ 10-12 L/min per rebreather mask
2) reposition mother to side, other side or knee chest position
3) check maternal blood pressure. If hypotensive, elevate legs and give bolus of LR or NS.
4) stop oxytocin if being used
5) notify doctor
6) consider tocolysis (terbutaline) as ordered by doctor
7) prepare for possible emergency delivery or c-section

6. PROLONGED DECELERATION
* Visually apparent decrease in FHR below the baseline. Gradual or abrupt decrease of ≥ 15 bpm lasting ≥ 2 minutes but < 10 minutes from onset to return to baseline.
* possible causes include:
  a) maternal hypotension
  b) rapid descent of fetus
  c) prolapsed or compressed umbilical cord
  d) severe (acute or chronic) hypoxia
  e) worsening acidosis
  f) impending fetal death

Treatment for prolonged deceleration
1) stop oxytocin, if used
2) reposition to side, other side or knee chest position
3) O₂, 10-12 L per minute per rebreather mask
4) check BP, fluid bolus if necessary
5) notify doctor

Notify Doctor If:
Collaborate with physician suspicious FHR patterns not relieved by interventions
* progressive increase or decrease in baseline rate
* tachycardia greater than 160 or greater then 30 bpm from previous baseline
* decreased or no variability
* late decelerations of any magnitude
* a severe variable deceleration of less than 70 bpm and lasting for 30-45 seconds with a rising baseline rate. This may be associated with decreasing variability, a slow return to baseline, or absence of variability
* a prolonged deceleration or severe bradycardia

**Documentation:**

The monitor tracing and/or the labor nurse notes should include:
* patient ID: addressograph stamp each strip
* Fetal monitoring interpretation
* Nursing interventions
* Medications given
* vital signs
* voidings or emesis
* pushing
* equipment adjustments such as rezeroing, relocation of transducers, removal and replacement of electrodes or catheters
* interventions
* Dr’s presence

Electronic documentation of the monitor strip will be on an archiving disc as of September 2001. WCC will maintain OB Trace Vue discs for 21 years.

**References:**

2. Perinatal Continuing Education Program, 2000, Book I, Maternal and Fetal Evaluation, Unit 3 pages 14-44