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FETAL HEALTH SURVEILLANCE IN LABOUR	**3-F-1**	1 of 13
AUTHORIZATION: OS: L&D Nurse Managers & Instructors Obstetrics Management Committee (2009 Feb 4) Women's Health Managers Committee (2009 Mar 10)	DATE ESTABLISHED REGIONALLY November, 1998	DATE REVISED REGIONALLY 2009 November 25

PURPOSE

1. To provide a consistent approach and terminology to fetal surveillance in labour
2. To decrease the incidence of birth asphyxia while maintaining the lowest possible rate of obstetrical intervention (SOGC, 2007)

CONTENTS

ACRONYMS/SYMBOLS

Acceptable acronyms and symbols in this policy, also acceptable in documentation, of fetal health surveillance

FHR	Fetal Heart Rate		
bpm	beats per minute		
IA	Intermittent Auscultation		
EFM	Electronic Fetal Monitoring		
>	Greater than	≥	Equal to or greater than
<	Less than	≤	Equal to or less than

POLICY

1. **Patient Participation in Fetal Health Surveillance Decisions**

1.1 When using any option for fetal surveillance, the rational for the choice of method should be communicated to the woman and her attendants. This discussion should be documented in the chart.

1.2 The woman and her partner should be involved in the decision making process regarding the selection of fetal health surveillance methods and all aspects of care.
Refer to Calgary Health Region Patient Experience/Patient & Family Centred Care and to Regional Policy 1414, Consent for Treatment…

2. Fetal Health Surveillance Requirements

All patients who present to triage are to be assessed for risk factors for adverse perinatal outcomes, refer to Appendix A page 11. (SOGC 2007 Recommendation 10)

2.1 Patients without risk factors for adverse perinatal outcomes:

- Use Intermittent Auscultation for fetal health surveillance on admission to triage and during active labour. (SOGC Recommendation 9 & 10)
- IA may be used with epidural anesthesia with increased FHR assessment of every 5 minutes for 30 minutes following initiation and bolus doses. Increased frequency of IA is not required following patient administered doses. (SOGC Recommendation 9)
- In the presence of abnormal fetal heart characteristics detected by intermittent auscultation, and unresponsive to resuscitative measures, increased surveillance by continuous electronic fetal monitoring, or fetal scalp sampling, or delivery is to be instituted.

2.2 Patients with risk factors for adverse perinatal outcomes:

- Admission fetal heart tracing of at least 20 minutes.
- Electronic fetal monitoring in active labour.
- During first stage of labour, if EFM tracing is normal and maternal-fetal condition is stable, EFM may be interrupted for up to 30 minutes, to facilitate ambulating, bathing, showering. If oxytocin is being administered, the infusion rate is not to be increased while off EFM.
- If EFM tracing is atypical or abnormal, electronic fetal monitoring is to be continuous, intrauterine resuscitation measures attempted and the attending physician notified. (SOGC Recommendation 11)

3. Assessment of fetal heart is to be documented as follows:

- 1st stage of labour (> 3cm with regular contractions) every 15 - 30 minutes
- 2nd stage of labour **without** active pushing every 15 minutes
- 2nd stage of labour **with** active pushing every 5 minutes.

4. Cord Blood

At delivery, cord blood from the placental side is to be obtained for blood gas analysis; although cord blood gas results may provide guidance for appropriate newborn care, practitioners should **not** wait for the results of the analysis to provide care for the newborn at birth.

DEFINITIONS

Active labour: Cervical dilation >3 cm in the presence of regular uterine contractions (regardless of parity)

Baseline FHR: The approximate **mean** FHR, rounded off to the nearest 5 bpm during a 10-minute segment, which meets the following criteria:

- Between contractions
- No marked baseline variability
- No accelerations or decelerations

NOTE: If criteria are not met, then baseline FHR cannot be assessed.

Tachycardia: Baseline FHR >160 bpm ≥ 10 minute duration
Bradycardia: Baseline FHR <110 bpm ≥ 10 minute duration

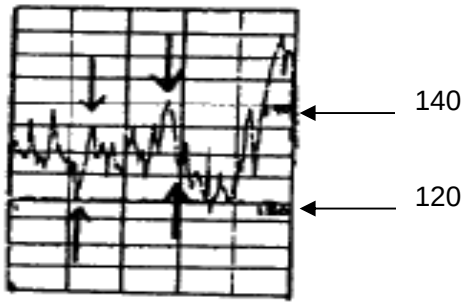
Baseline variability: FHR fluctuations in the baseline FHR determined by choosing 1 minute of a 10 minute section of the FH tracing with at least 2 cycles/minute that is free from accelerations and decelerations, and measuring the difference between the lowest and highest rate. The difference is the range/amplitude of variability

Classification of variability (SOGC Fetal Health Surveillance: Antepartum and Intrapartum Consensus Guideline 2007)

Range/Amplitude	Terminology
Undetectable	Absent
≤ 5 bpm	Minimal
6-25 bpm	Moderate
≥ 25 bpm	Marked

Figure 1: Baseline Variability

Irregular fluctuations of FHR
Amplitude: vertical depth of FHR from peak to trough
In this example the amplitude is 10 bpm (between the vertical arrows) which is Moderate variability.



Sinusoidal pattern: **Abnormal** pattern that is particularly distinctive, with a **smooth** sine wave of **regular** frequency and amplitude

Periodic Changes: Increases or decreases of the FHR from the baseline

Acceleration: Abrupt increase in FHR:

- ≥ 32 weeks gestation: ≥ 15 bpm above baseline FHR for ≥ 15 seconds, and < 2 minutes from onset to return to baseline.
- < 32 weeks gestation: ≥ 10 bpm above baseline FHR for ≥ 10 seconds, and < 2 minutes from onset to return to baseline.

NOTE: an increase that lasts more than 10 minutes is a baseline change; not an acceleration.

Deceleration: A gradual or abrupt decrease in FHR

- **Early**: **gradual** decrease in FHR, **mirrors** the contraction (Figure 1)

- **Late**: **gradual** decrease in FHR and return to baseline, onset, nadir and recovery of the deceleration occur after the beginning, peak and ending of the contraction, respectively. (Figure 2)
- **Uncomplicated variable**: initial acceleration, rapid deceleration of the FHR to the lowest point, followed by rapid return to the baseline with a secondary acceleration. (Figure 3)

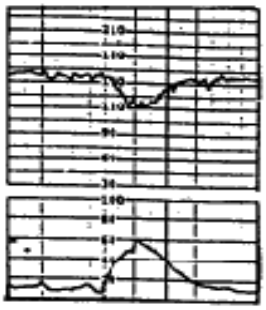


Figure 1
Early Deceleration

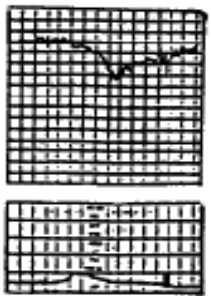


Figure 2
Late Deceleration

Figure 3
Variable Deceleration

- **Complicated variable decelerations** (may indicate fetal hypoxia) **may have any of the following characteristics:**
  - Deceleration to less than 70 bpm lasting more than 60 seconds,
  - Loss of variability in the baseline FHR and in the trough of the deceleration
  - Biphasic deceleration,
  - Prolonged secondary acceleration (post deceleration smooth overshoot of more than 20 bpm increase and/or lasting more than 20 seconds)
  - Slow return to baseline
  - Continuation of baseline rate at a lower level than prior to the deceleration
  - Variable decelerations in conjunction with fetal tachycardia or bradycardia.

POINTS OF EMPHASIS

Key Recommended Standards For Fetal Surveillance In Labour

1. Women in active labour should receive continuous close support from a professional, appropriately-trained; one-to-one nursing is recommended.
2. All health care professionals must be familiar with the paper speed used at the beginning of every patient electronic fetal monitoring; the correct time is to be recorded on the electronic fetal monitoring record.
3. Fetal scalp blood sampling is recommended for assessment of fetal acid-base status in presence of abnormal fetal heart characteristics on IA and atypical or abnormal EFM at gestations > 34 weeks when delivery is not imminent or if digital fetal scalp stimulation does not result in an acceleratory fetal heart rate response. (SOGC Recommendation 13) *Refer to policy Fetal pH Testing (Scalp Sampling) 3-P-1.*

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INTERMITTENT AUSCULTATION (IA)

Methods

- Hand held Doppler
- Ultrasound transducer from electronic fetal monitor if no permanent recording is created.

Procedure

1. Palpate the maternal abdomen to identify fetal presentation and position (Leopold's maneuvers),
2. Place hand held Doppler, or ultrasound transducer from electronic fetal monitor over the fetal back,
3. If using ultrasound transducer from electronic fetal monitor, ensure the 'record' button is **'off'**
4. Check and document maternal radial pulse to differentiate maternal heart rate from fetal heart rate
5. Auscultate FHR for a **minimum** of 60 seconds, **immediately after** a uterine contraction, frequency as follows:

• 1st stage of labour (> 3cm with regular contractions)	every 15 - 30 minutes
• 2nd stage of labour without active pushing	every 15 minutes
• 2nd stage of labour with active pushing	every 5 minutes.

Assess & Document

- Baseline FHR
- Rhythm
- Nature of changes – gradual or abrupt accelerations or decelerations.
  Absence of audible accelerations does not necessarily indicate fetal compromise: if pattern persists for ≥ 30 minutes, options include listening for accelerations after the next 2-3 contractions, performing digital fetal scalp stimulation, or commencing EFM to clarify FHR pattern
- Uterine contractions
  - Frequency
  - Duration
  - Intensity (strong intensity – fundus cannot be indented with a finger)
  - Relaxation of uterus (resting tone)

Interpretation

Normal

- Fetal Heart consistent and rate 110 – 160 bpm
- Rhythm normal
- Acceleration(s) audible (at least one in the previous 30 min.)

Abnormal

- Fetal Heart Rate <110 bpm OR >160 bpm or rising heart rate
- Abnormal rhythm
- Decelerations audible

Interventions/management

- For technically inadequate audible FHR, initiate EFM
- For **Normal or Abnormal** refer to Appendix B: Clinical Decision Making-Fetal Health Surveillance in Labour

Documentation of Fetal Health Surveillance (IA)

All maternal/fetal assessments must be documented on the labour partogram and the clinical actions taken on the Multidisciplinary Progress Record; documentation is to include:

1. FHR data:
    - Rate in bpm
    - Rhythm
    - Acceleration(s)
    - Deceleration(s)
2. Uterine activity characteristics - palpation or Intrauterine Pressure Catheter (IUPC):
    - Frequency
    - Intensity
    - Duration
    - Relaxation of uterus (resting tone)
3. Interpretation: **Normal or Abnormal**
4. Specific actions taken
5. Other maternal observations and assessments
6. Maternal and fetal responses to interventions
7. Subsequent return to normal findings

ELECTRONIC FETAL MONITORING (EFM)

Methods

- External monitoring with ultrasound transducer
- Internal monitor with a spiral electrode attached to the fetal presenting part

Procedure

1. Palpate the maternal abdomen to identify fetal presentation and position (Leopold's maneuvers)
2. Check paper speed
3. Ensure fetal monitoring machine is set at correct time
4. Record current date, patient's name, physician and nurse's signature on monitor paper **before** commencing monitoring
5. Place the ultrasound transducer over the fetal back
6. Ensure electronic fetal monitor 'record' button is turned **'on'**
7. Ensure FHR is **accurately recording** on fetal monitor tracing
8. Check and document maternal radial pulse to differentiate maternal heart rate from fetal heart rate
9. Place tocodynamometer (toco) over fundus of uterus
10. Ensure uterine activity is accurately recording on fetal monitor tracing

Document interpretation of Electronic Fetal Monitoring Tracing

- 1st stage of labour **(> 3 cms with regular contractions)** every 15 – 30 minutes
- 2nd stage of labour **without** active pushing every 15 minutes
- 2nd stage of labour **with** active pushing every 5 minutes

Assess and Record

- Baseline FHR
- Baseline FHR variability
- Acceleration(s)
- Deceleration(s)
- Changes or trends in FHR pattern over time

Interpretation

NORMAL → May have up to 30 minute periods off of EFM for ambulation, showering and comfort measures

Gestational age ≥ 32 weeks

- Baseline FHR: 110 - 160 bpm
- Baseline variability: Moderate (amplitude of 6-25 bpm)
- Acceleration(s): ≥15 bpm x ≥15 seconds lasting < 2 minutes
  ≥ one acceleration in the previous 15 - 30 min. of the fetal monitor tracing

Gestational age of < 32 weeks

- Baseline FHR: 110-160 bpm (although may be closer to the upper range)
- Baseline variability: Moderate (amplitude of 6-25 bpm)
- Acceleration(s): ≥ 10 bpm x ≥10 seconds lasting <2 minutes in the previous 15 – 30 min of the fetal monitor tracing

ATYPICAL → **WARNING**

FHR characteristics requiring ↑ FHR surveillance & notification

- Baseline FHR: Bradycardia 100-110 bpm
  Tachycardia > 160 bpm for > 30 min. < 80 min.
  Rising baseline
- Variability: ≤ 5 bpm for 40-80 min.
- Decelerations: Repetitive (≥ 3) uncomplicated variable decelerations
  Occasional late decelerations
  Single prolonged deceleration > 2 min but < 3 min
- Accelerations: Absence of accelerations, with fetal scalp stimulation

ABNORMAL → **STOP**

FHR characteristics requiring immediate intervention & notification

- Baseline FHR: Bradycardia < 100 bpm
  Tachycardia >160 bpm for >80 min
  Erratic baseline
- Variability: ≤ 5 bpm for > 80 min
  ≥ 25 bpm for > 10 min
  Sinusoidal
- Decelerations: Repetitive (≥ 3) complicated variables:
  Late decelerations > 50% of contractions
  Single prolonged deceleration > 3 min
- Accelerations: Absent or present does not change classification of EFM tracing

Interventions/management

NORMAL: EFM may be interrupted for periods up to 30 min if maternal-fetal condition stable and/or oxytocin infusion rate is stable.

ATYPICAL: Continue EFM and:

1. Reduce or stop oxytocin infusion if applicable
2. Institute appropriate intrauterine resuscitation techniques:
   - Change maternal position
   - Hydrate, if evidence of hypovolemia
   - Modify pushing method
   - Reduce anxiety and modify breathing 'techniques'
   - Administer 0_2 via mask at 8 – 10 liters per minute
   - Fetal scalp stimulation
3. Notify primary physician/registered midwife

ABNORMAL: Continue EFM and:

1. Review overall clinical situation
2. Obtain scalp pH if appropriate
3. Prepare for delivery

Documentation of Fetal Health Surveillance (EFM)

1. FHR data:
   - Baseline FHR rate
   - Baseline FHR variability
   - Acceleration(s)
   - Decelerations
   - Changes or trends in FHR pattern over time
2. Uterine activity characteristics obtained by palpation or Intrauterine Pressure Catheter (IUPC)
   - Frequency
   - Intensity
   - Duration
   - Relaxation of uterus (resting tone)
3. Interpretation (refer to Appendix C)
4. Specific actions taken
5. Other maternal observations and assessments
6. Maternal and fetal responses to interventions
7. Subsequent return to normal findings

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8. Wilson, RD. Fetal Health surveillance guideline: antenatal and intrapartum consensus. Journal of Obstetrics and Gynaecology Canada: JOGC 2007 Dec; Vol. 29 (12), pp 972;

CROSS REFERENCES

Subject/Title	***Number***	***Manual***
• Fetal pH Testing (Scalp Testing)	**3-P-1**	Women's & Infant Health Manual
• NonStress Test (NST): Antepartum Women		Women's & Infant Health Manual

APPENDIX A

Antenatal and intrapartum conditions associated with increased risk of adverse fetal outcome* where intrapartum electronic fetal surveillance may be beneficial.

Antenatal

Maternal
- Hypertensive disorders of pregnancy
- Pre-existing diabetes mellitus/Gestational diabetes
- Antepartum hemorrhage
- Maternal medical disease: cardiac, anemia, hyperthyroidism, vascular disease and renal disease
- Maternal MVA/trauma
- Morbid obesity

Fetal
- Intrauterine growth restriction
- Prematurity
- Oligohydramnios
- Abnormal umbilical artery Doppler velocimetry
- Isoimmunization
- Multiple pregnancy
- Breech presentation

Intrapartum

Maternal
- Vaginal bleeding in labour
- Intrauterine infection/chorioamnionitis
- Previous Caesarean section
- Prolonged membranes rupture > 24 hours at term
- Induced labour
- Augmented labour
- Hypertonic uterus
- Preterm labour
- Post-term pregnancy (> 42 weeks)
- Post-term pregnancy (>41 3/7 weeks unless a normal amniotic fluid volume and normal NST have been documented in the last 48 hours)
- All pregnancies > 42 weeks gestation

Fetal
- Meconium staining of the amniotic fluid
- Abnormal fetal heart rate on auscultation

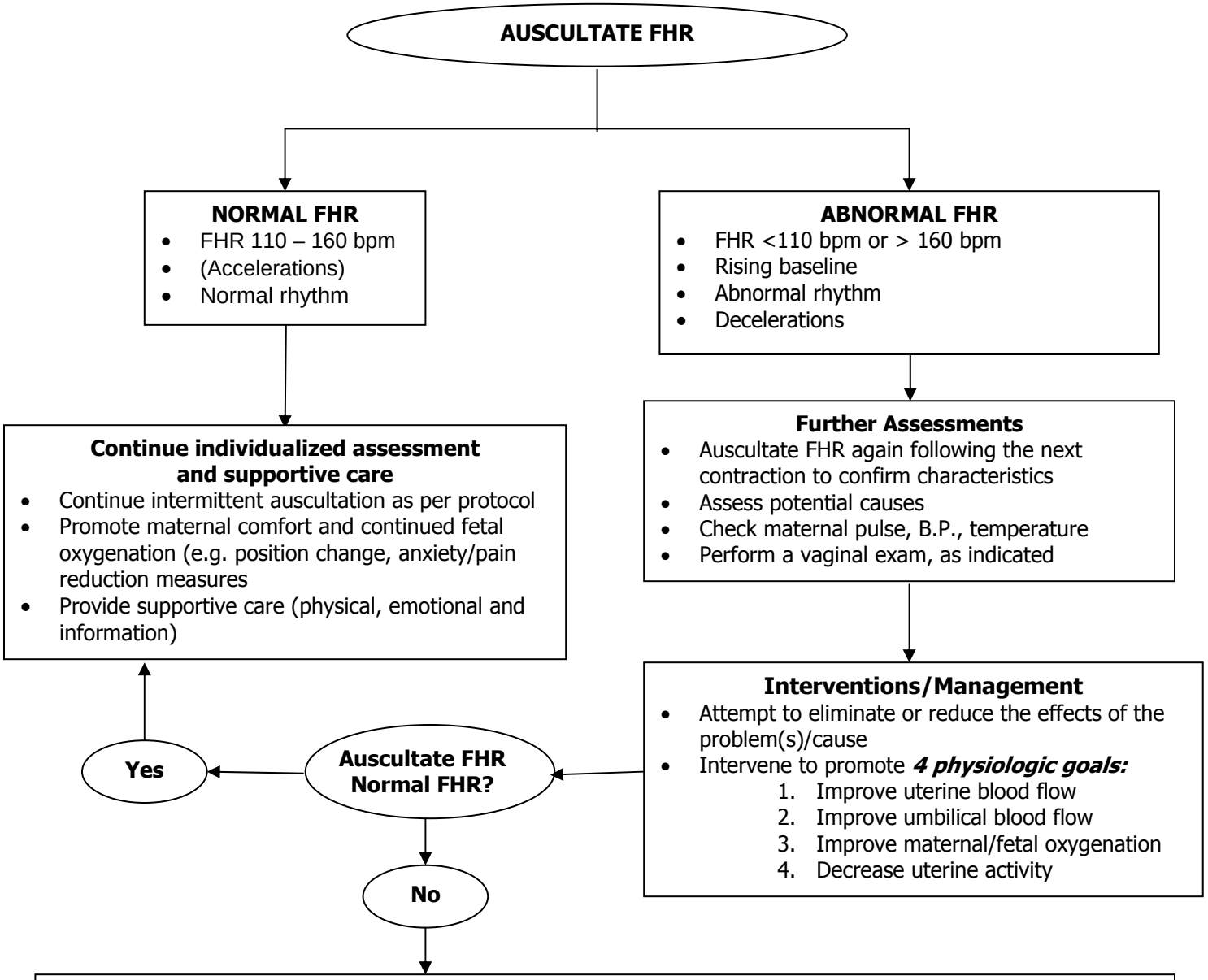
*Adverse fetal outcome: cerebral palsy, neonatal encephalopathy, and perinatal death.

Adapted from RCOG Evidence-based Clinical Guideline Number 8, May 2001. The use of electronic fetal monitoring.

SOGC Fetal Health Surveillance: Antepartum and Intrapartum Consensus Guideline, Intrapartum Fetal Surveillance Table 12 page S33

APPENDIX B

(Adapted from SOGC Fetal Health Surveillance: Antepartum and Intrapartum Consensus Guideline 2007)



Adapted from: Feinstein NF, Sprague A, & Trépanier MJ.(2000).Fetal heart rate auscultation.AWHONN.
Sprague, A. (1995). Auscultation of FHR–Decision-tree. PPPESO.
Written permission to reproduce above chart received from SOGC August 20, 2002.

APPENDIX C

Classification of Intrapartum EFM tracings

	Normal Tracing (Previously "Reassuring")	Atypical Tracing (Previously "Non-reassuring")	Abnormal Tracing (Previously "Non-reassuring")
Baseline	▪ 110–160 bpm	▪ Bradycaria 100–110 bpm ▪ Tachycardia > 160 bpm for > 30 min. to < 80 min. ▪ Rising baseline	▪ Bradycardia < 100 bpm ▪ Tachycardia > 160 for > 80 min. ▪ Erratic baseline
Variability	▪ 6–25 bpm (moderate) ▪ ≤5 bpm for <40 min	▪ ≤ 5 for 40–80 min. (absent or minimal)	▪ ≤ 5 for > 80 min. (absent or minimal) ▪ ≥ 25 bpm (marked) > 10 min. ▪ Sinusoidal pattern (Distinctive smooth sine wave of regular frequency and amplitude)
Decelerations	▪ None ▪ Occasional uncomplicated variable decelerations: – Initial acceleration, rapid deceleration of the FHR to the lowest point, followed by rapid return to the baseline with a secondary acceleration. ▪ Early decelerations: – Gradual decreased in FHR, mirrors the contraction	▪ Repetitive (≥3) uncomplicated variable decelerations ▪ Occasional late decelerations: – Gradual decrease in FHR and return to baseline; onset, lowest point and recovery of the deceleration occur after the beginning, peak and ending of the contraction, respectively. ▪ Single prolonged deceleration > 2 min but < 3min	▪ Repetitive (≥ 3) complicated variables: – Deceleration to < 70 bpm for > 60 sec. – Loss of variability in trough or in baseline – Biphasic deceleration – Overshoots – Slow return to baseline – Baseline lower after deceleration – Baseline tachycardia and bradycardia ▪ Late decelerations in > 50% of contractions ▪ Single prolonged deceleration > 3 min but <10 min
Accelerations	▪ Spontaneous accelerations present – ≥ one acceleration in the previous 15-30 min of the fetal monitoring tracing (Gestational age ≥ 32 weeks FHR increases ≥ 15 bpm X ≥ 15 Seconds lasting < 2 minutes. (Gestational age < 32 weeks FHR increases ≥ 10 bpm X ≥ 10 seconds lasting < 2 minutes in the previous 15-30 min of the fetal monitoring tracing) ▪ Accelerations present with fetal scalp stimulation	▪ No acceleration with fetal scalp stimulation	▪ Usually absent (presence of accelerations does not change classification of tracing)
Action	EFM may be interrupted for periods of up to 30 min if maternal-fetal condition stable and/or oxytocin infusion rate stable	Further vigilant assessment required, especially when combined futures present	**ACTION REQUIRED** Review overall clinical situation, obtain scalp PH if appropriate/prepare for delivery

Adapted from SOGC, Fetal Health Surveillance: Antepartum and Intrapartum Consensus Guideline. Journal of Obstetrics and Gynaecology Canada; Vol 29, No 9, Sept 2007.