**SCOPE:**

This policy and procedure applies to nurses and professional staff with privileges caring for labouring patients in the Birthing Unit at the Royal Victoria Regional Health Centre (RVH).

**POLICY STATEMENT:**

It is the policy of RVH to provide safe evidence based care to our patients. There are important factors in the assessment of labour progress, including the frequency, duration and strength of contractions. This may be achieved by:

* Manual palpation
* External tocodynamometry
* Internal tocodynamometry
1. The IUPC shall be inserted by an Obstetrician under aseptic conditions.
2. The IUPC enables accurate assessment of the intensity, frequency and duration of uterine contractions and uterine resting tone. It is capable of measuring the hydrostatic pressure within the uterus in mmHg. Use of a IUPC is recommended:
	1. when external methods do not provide an adequate contraction pattern i.e. patient movement and in some cases patient obesity.
	2. to determine Montevideo Units (MVU) in cases of suspected labour dystocia or during labour induction and augmentation.
	3. to identify the precise relationship between the start/end of fetal heart rate deceleration and when the start/end of the contraction is not clear with external monitoring but is necessary for interpreting the fetal heart rate pattern.
	4. to assist with titrating oxytocin to provide optimal contractions and prevent tachysystole
	5. for amnioinfusion
3. The nurse can administer an amnioinfusion bolus or maintenance dose as per Obstetrician’s orders.
4. Contraindications include:
	1. known or suspected placenta previa or vasa previa
	2. suspected abruption or bleeding of unknown origin
	3. presence of clinical chorioamnionitis
	4. active infection (i.e. genital herpes, human immunodeficiency virus)
5. Set up, maintenance and assessment of functioning of the IUPC are the responsibilities of the Birthing Unit (BU) nurse.
6. This technology does not replace care by experienced and supportive nurses monitoring the contractions by tactile assessment.

**DEFINITIONS:**

**Amnioinfusion:** the instillation of sterile, balanced fluid into the uterine cavity during labour, through an intrauterine pressure catheter transcervically after the rupture of fetal membranes.

**Interpretable electronic fetal monitoring:** electronic fetal monitoring tracing that has a continuous display of the fetal heart rate and uterine activity with minimal gaps.

**Montevideo Units (MVU):** are used to quantify contractions and determine their relationship to labour progress**.** Theyare calculated by subtracting the baseline uterine pressure from the peak contraction pressure of each contraction in a 10 minute period and measuring the pressures generated by each contraction.

* Example: uterine pressure above baseline equals 50 mm of mercury
* During 10 minute period of measurement, three contractions occurred
* Total MVU would be equal to 150 MVUs (3x50)

The goal is 180 to 210 MVUs to achieve a normal rate of descent and cervical change. Individual contractions are considered adequate when there is an increase of at least 50 to 60 mm of mercury above baseline.

**Oligohydramnios**: amniotic fluid volume that is less than expected for gestational age. It may be described qualitatively (e.g. reduced amniotic fluid volume) or quantatively (e.g. amniotic fluid index less than or equal to five centimeters, single deepest pocket less than two centimeters).

**Tachysystole:**  more than five contractions in a 10 minute period averaged over 30 minutes and/or contractions that last 90 seconds or longer and/or when the uterine resting tone does not soften (by palpation) for 30 seconds. Clinician assessment will be warranted as some women will have uterine activity as per this definition but will not be moderate to strong upon palpation and/or actively labouring in early administration of oxytocin.

**Intrauterine Pressure Catheter**

**PROCEDURE:**

Equipment

* Electronic fetal monitor with IUPC capability
* Disposable IUPC
* IUPC cable
* Sterile gloves
* Lubricating gel
1. Continue with external toco monitoring until internal monitoring is ready to commence.
2. Ensure the patient’s bladder is empty prior to procedure.
3. Confirm patient has ruptured membranes and indication for insertion of IUPC (i.e. arrested cervical dilatation).
4. Introduce care providers utilizing a standardized introduction.
5. Perform hand hygiene and don appropriate personal protective equipment (PPE).
6. Assist patient into wedged supine position.
7. Perform peri care.
8. Using sterile technique open the IUPC package.
9. Attach the cable to the catheter and plug into the monitor. (Refer to Appendix I: *IUPC* *Connection to Cable).*
10. To “zero” the catheter before it is placed, press the “zero/re-zero” button on the cable. (Refer to Appendix II: *Zero/Re-Zeroing Button).*
11. Note the green flashing light on the cable, it will flash for five seconds.
12. While the green light is flashing, adjust the monitor to zero.
13. If the zeroing process takes longer than five seconds, or the button was not pressed, baseline may be negative, re-zero again.
14. The Obstetrician shall:
	1. perform a sterile vaginal exam to ensure ruptured membranes and determine cervical dilatation, fetal presentation and position. Fingers remain in the vagina.
	2. use the examining hand as a guide, advance the catheter tip to the cervical os.
	3. NEVER advance the introducer through the cervix.
	4. insert the IUPC on the opposite side to the placental site.
	5. not force the catheter if resistance is met.
	6. stop the procedure and remove the catheter if frank blood is encountered.
	7. gently advance the catheter tip through the cervical os into the intra-amniotic cavity until the 45 cm mark is at the introitus.
	8. stop the insertion when the stop symbol (•) on the catheter meets the transducer if the 45 cm marker is not clearly visible.
	9. feed the catheter flat and advance a few centimeters at a time.
	10. slide the introducer out of the vagina while holding the catheter in place.
	11. slide thumb between the catheter and introducer tab when the introducer is completely out of the vagina which will begin to separate the introducer from the catheter.
	12. anchor the catheter in place with one hand and pull the introducer straight back off the catheter.
15. The nurse shall:
	1. secure the catheter to the patient’s thigh as close to the introitus as possible using the adhesive pad included in the package. (Refer to Appendix III: *Securing Pressure Catheter).*
	2. connect the IUPC cable to the monitor.
	3. zero the system as explained above.
	4. instruct patient to cough and observe the fetal monitor tracing.
	5. observe a spike on the tracing in response to the cough.
	6. discontinue the IUPC as ordered by the Obstetrician.

Initial Assessment

1. Palpate uterine activity to validate IUPC findings.
2. Document:
	1. Time of insertion
	2. Indications for IUPC placement
	3. Baseline resting tone pressure
	4. The maternal position and baseline resting tone pressure in left, right lateral and semi-fowler’s positions.
	5. When a change in resting tone is observed, record the maternal position and palpate the uterine resting tone
	6. Patient tolerance of the procedure.

Ongoing Assessments

1. Palpate uterine activity (contractions and resting tone) to validate IUPC findings every one hour and PRN.
2. Calculate MVU over a 10 minute time period every 15 minutes and PRN.
3. Adjust oxytocin infusion according to protocol and pattern of labour as indicated by the IUPC tracing.
4. Report any of the following to the obstetrician:
	1. Tachysystole
	2. Dampened IUPC waveform as it may indicate blocked catheter
	3. Atypical and abnormal fetal heart rate patterns
	4. Resting tone greater than 25 mmHg (Refer to Appendix IV: *Troubleshooting).*
5. Improve fetal oxygenation using intrauterine resuscitative measures as listed in RVH Policy and Procedure: *Fetal Health Surveillance.*

**Amnioinfusion**

Amnioinfusion is a therapeutic option available for intrauterine resuscitation to help decrease or eliminate problems that are associated with a severe reduction or absence of amniotic fluid (oligohydramnios). Oligohydramnios can cause intrapartum compression on the umbilical cord resulting in variable decelerations of the fetal heart rate associated with fetal hypoxia, acidosis and increased incidence of operative birth.

Amnioinfusion can be used in the presence of oligohydramnios **and** repetitive fetal heart rate variable decelerations. This procedure has been shown to reduce the occurrence of decelerations, improve short-term measures of neonatal outcome and lower the use of caesarean section.

Amnioinfusion is not recommended as a treatment for meconium stained fluid as it does not decrease or reduce the risk of moderate to severe meconium aspiration syndrome or perinatal death.

**PROCEDURE:**

Equipment

* Electronic fetal monitor
* Infusion pump
* IUPC insitu
* One litre 0.9% normal saline at room temperature labelled for amnioinfusion
* Intravenous tubing for mainline primed with 0.9% normal saline at room temperature
1. The Obstetrician inserts the IUPC as described above.
2. Remove the cap from the amnio port on the IUPC.
3. Attach the primed IV tubing to the amnio port.
4. Place IV tubing in infusion pump.
5. Infuse an initial bolus of 300 mL of 0.9% normal saline over 20 minutes as per obstetrician’s order.
6. Following the initial bolus, regulate infusion rate as ordered (usually 100 mL to 200 mL per hour)
7. Document the total volume of saline infused.
8. Apply electronic fetal monitor for continuous monitoring.
9. Observe and document every 15 minutes for the first hour after the IUPC insertion and start of amnioinfusion:
	1. colour and amount of fluid return
	2. fetal heart rate and pattern
	3. intrauterine catheter placement
	4. uterine pressure in Montevideo units
	5. fetal heart rate response to the infusion
	6. contraction intensity and frequency and pressures before, during and after the amnioinfusion continually during the procedure
	7. maternal position during and after amnioinfusion
	8. patient tolerance of procedure

NOTE: The resting tone recording will be higher (by approximately 15 mm Hg) than normal, caused by the positive pressure flow from the fluid at the end of the catheter.

1. Reassure the patient that an increase of leaking fluid is expected.
2. Review the FHR pattern to determine whether the amnioinfusion is improving the fetal status. Improvement may require 20 to 30 minutes following installation of fluid.
3. If no improvement in FHR after the infusion of 800 to 1000 mL notify the Obstetrician.
4. Discontinue the amnioinfusion as per Obstetrician’s orders.
5. Discuss the ongoing need for the IUPC to monitor uterine contractions versus external uterine monitoring.

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| --- | --- | --- |
| **Problem** | **Possible Causes** | **Actions** |
| No contraction wave form | IUPC has fallen out; IUPC is disconnected from monitor or cable; poor cable/monitor connection; uterine perforation, catheter is in the peritoneal cavity (rare); perforation of fetal or placental vessel (rare). | * Check IUPC is still in utero. 30 to 45 cm mark should be at the introitus
* Check connections between IUPC cable, and monitor
* Re-zero IUPC transducer
* Have patient perform Valsalva maneuver → a spike indicates it is in the peritoneal cavity. If the catheter is pulled back out slightly, contraction waveform should be seen when it is back in the uterus.
* Obstetrician to replace IUPC if still required and it has fallen out.
* Perforation of fetal or placental vessel may result in fetal heart rate changes (rare).
 |
| Resting tone is too low (less than 5 mmHg) or too high without apparent cause (greater than 25 mmHg with uterus soft on palpation) | IUPC malfunction; IUPC placement: entrapped between fetus and uterine wall, cable malfunction, monitor malfunction. | * Re-zero IUPC transducer
* Reposition catheter
* If dampened wave form less than 5 mmHg, reposition the catheter tip by twisting the catheter.
* Obstetrician to replace IUPC if needed
* If high resting tone, pull back catheter to change its position.
* Discontinue oxytocin until source of high resting tone is determined.
 |
| Straight line on tracing of UA channel | IUPC has fallen out; loose connections between IUPC cable and/or fetal monitor; IUPC or cable is defective. | * Check connections and tighten
* Re-zero IUPC
* Change monitor cable
* Obstetrician to replace IUPC if needed
 |
| Artifact on contraction waveform or unusual jagged tracing | IUPC is in a dry area (inadequate amount of amniotic fluid); IUPC defect | * Pull IUPC back slightly
* Obstetrician to replace IUPC if needed
* Amnioinfusion (volume may be needed for oligohydramnios as per Obstetrician order) to increase amniotic fluid
 |

Adapted from: Providence Health Care (2013).