# Women's & Newborn Health Program
# Policy & Procedure

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| **TITLE:** | Fetal Spiral Electrode – Application and Management | **NUMBER:** | 7050 |
| Sponsor**:** | Manager Birth Unit | Page: | 1 of 11 |
| Approved by: | Policy and Practice Committee | Approval Date:<br>Effective Date: | March 9th, 2021<br>April 1st, 2021 |
| Applies To: | Birth Unit Registered Nurses, Midwives, and Physicians | | |

## This is a Beyond Entry Level Competency (BELC) for Registered Nurses at the IWK requiring initial and ongoing education requirements

## POLICY STATEMENTS

1. All viable unborn fetuses will receive ongoing fetal health surveillance while mother is in labour and admitted to the Birth Unit.

2. The use of a fetal spiral electrode (FSE) for internal monitoring is indicated when the external fetal heart rate (FHR) tracing is inadequate for interpretation and must be ordered by an authorized prescriber through either a patient-specific order or a care directive.

3. The care and management of FSE must occur in the Birth Unit at IWK Health.

4. A patient-specific order and consultation with physician prior to the application of a fetal spiral electrode is preferred when the clinical situation and timing allows. In an emergency situation, an RN who has satisfied the BELC requirements may apply the FSE in accordance with IWK Care Directive #7050.1 – *Application of Fetal Spiral Electrode*.

5. FSE application may be performed by Registered Nurses, Midwives, and Physicians in the Birth Unit.

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5.1 Application of a fetal spiral electrode (FSE) is a beyond entry level competency (BELC) for Registered Nurses (RNs) which requires initial and ongoing education requirements as outlined in this document.

6. The provision of this care must be performed by Birth Unit RNs who have:
    a. Completed Birth Unit orientation.
    b. A minimum of six months Birth Unit experience.
    c. Successfully completed a Fundamentals of Fetal Health Surveillance course approved by the IWK Health Childbirth Care Team. This course requires successful completion of an online module and exam with attendance at an in-person/virtual workshop. This course will be offered as needed throughout the year.
    d. Have successfully completed the IWKs Application of Spiral Electrode self-directed learning package.
    e. Have successfully completed the IWK Vaginal Examination self-directed learning package.
    f. Have been supervised by an RN or a physician (with experience applying fetal spiral electrodes) and have demonstrated competence prior to performing FSE application independently.

7. RNs, physicians and midwives are accountable and responsible to self-assess their competency in application of FSE on an annual basis. If there are self-identified gaps in their level of knowledge, skill, and expertise, the health care provider (HCP) is required to take-action to address any learning needs to ensure the delivery of safe care. For RNs, this could include notifying the Team leader, Clinical Leader of Development, or Clinical Leader of Operations for assistance.

## GUIDING PRINCIPLES AND VALUES

The fetal spiral electrode provides instantaneous and continuous recording in clear detail of the fetal heart rate and pattern. The direct fetal scalp electrode (FSE) is the most accurate way to assess fetal heart rate (FHR) but is invasive and should not be used unless the cervix is at least 2 centimeters dilated and the membranes ruptured (Simpson & Creehan, 2021).

The Women's and Childbirth Care Team recognizes and values a trauma informed approach. Basic strategies can assist HCPs in reducing experiences of psychological trauma or re-traumatization for the patient and their families during labour and birth. Showing compassion, empathy, and respect towards patients and families contributes to better experiences and outcomes.

Obstetric care providers should, at every clinical encounter, demonstrate the following examples of trauma informed approaches to patient care:

a. Establish the preferred language for communication

b. Identify yourself,
c. Provide explanations of procedures
d. Ask permission to touch a patient
e. Recognize and address signs of distress during procedures
f. Recognize that some people do not report or minimize their distress or pain
g. Maintaining privacy as much as possible
h. Consider pain management options
i. Explore if diverse needs of patient can be accommodated

## PROTOCOL

Considerations for Application of Fetal Spiral Electrode:

1. There are many clinical situations where it may be difficult to obtain a continuous fetal heart rate tracing.

| **The following clinical situations may cause difficulty obtaining consistent continuous FHR tracing with an external fetal monitor** | |
|---|---|
| Maternal<br><br>• High BMI (abdominal and adipose tissue)<br>• Polyhydramnios<br>• Oligohydramnios<br>• Detecting maternal pulse<br>• Maternal movement | Fetal<br><br>• Very active fetus<br>• Fetal position (i.e. posterior position)<br>• Intrauterine death<br>• Cardiac dysrhythmias<br>• Multiple fetuses |
| *Adapted from Table 5. SOGC, 2020* | |

2. When experiencing difficulty obtaining a continuous fetal heart rate tracing, the RN should first attempt troubleshooting measures which may include repositioning the patient, utilizing maternal pulse oximetry to better trace the maternal heart rate, or obtaining assistance from a second RN to improve the quality of fetal heart rate tracing.

3. It is important to avoid confusing the maternal heart rate with the fetal heart rate. Clinical conditions that increase risk of confusion may include:
    a. a low FHR baseline
    b. maternal pushing efforts during second stage labour
    c. maternal positioning
    d. maternal obesity

e. maternal tachycardia which may be associated with an elevated temperature, anxiety, pain, or medications

4. If the fetus is not alive, an internal FSE may detect the maternal ECG and record the maternal heart rate instead of the FHR (Miller, 2020).

## PROCEDURE

1. Prior to application of the fetal spiral electrode, assess the patient for any contraindications.
   **NOTE**: When there is a poor quality fetal tracing and there is consideration for use of the FSE, it may require a clinical assessment of the risks of transmission to the fetus in an individual situation versus the need to determine fetal well-being or the need for an emergency Cesarean section.

**Contraindications to FSE Application:**

- Face presentation, fontanels or genitalia presenting of the fetus
- Unknown presentation or presenting part
- Placenta previa or vasa previa, active vaginal bleeding of unknown cause
- Insufficient cervical dilation (less than 2 cm)
- Possible fetal coagulopathy (i.e. maternal carrier of hemophilia, maternal ITP, von Willebrand disease, fetal neonatal alloimmune thrombocytopenia)
- Active maternal infections (i.e. maternal HIV seropositivity, active genital herpes, hepatitis B or C)

2. Obtain informed consent (See IWK Health Policy #124.1 – *Consent to Treatment*). Explain the procedure to the patient and their support person(s) using terms and language they can understand before application. Provide physical and psychological comfort measures as required while considering the diverse needs of individuals.

3. Gather equipment:
   - Electronic fetal monitor
   - Disposable spiral electrode (See Appendix B)
   - Leg plate/cable
   - Cable securement device
   - Sterile gloves

4. Perform hand hygiene.

5. In the presence of intact membranes, a physician/midwife will need to perform an artificial rupture of membranes (ARM) prior to the application of the FSE.

6. Confirm that the cervix is at least 2 centimeters dilated and fetal presenting part is accessible and identifiable.

7. Using aseptic technique, open the electrode package and don sterile gloves. Leave wires locked in the handle notch at the top of the FSE.

8. Gently shape the outer guide tube to accommodate the anatomy of the patient, as needed.

9. Perform vaginal examination to assess presenting part (See IWK Policy #7172 – *Vaginal Examination*). Feel for firm bone and avoid the fetus' face, sutures, fontanels and genitalia; maintain fingers on target areas.

10. Introduce the guide tube between two examining fingers and position firmly against fetal presenting part at a right angle.

11. Pull the grip back out from the outer tube, enough to release the protection cap from the guide tube.

12. Push the grip back in until the spiral tip contacts the presenting part.

13. Maintain pressure against the presenting part with the guide and drive tubes and turn the inner tube clockwise (about 1 full turn) until mild resistance is met. **DO NOT OVER ROTATE**. Resistance to further rotation and recoil of the Drive Handle indicates attachment.

14. Release electrode wires from the handle notch and slide guide and drive tubes off wires.

15. Check placement of the electrode before withdrawing examining fingers.

16. Connect the Safety Cap or lead electrode to the bottom of the leg plate adapter cable.

17. Apply the adhesive side of the EKG lead electrode to the patient's leg.

18. Verify the FSE connector is clean and dry, then insert into the end if the leg plate adapter cable.

19. Plug cable into electronic fetal monitor.

20. Observe monitor tracing (compare fetal heart rate with maternal pulse). Color of tracing will change in IntelliSpace Perinatal (IPN) electronic monitoring, archival and documentation system to reflect internal device used for obtaining FHR.

21. Assist patient into a comfortable position, avoiding the supine position to facilitate adequate perfusion to the fetus. With a FSE, maternal positioning will not affect the fetal heart rate tracing and readjustments need not be made with position changes to ensure quality of fetal heart tracing is maintained.

22. During monitoring, if the electrode falls out, do not reinsert a same device. A new one should be used.

## REMOVAL

1. For Cesarean birth remove the fetal spiral electrode prior to vaginal preparation or immediately prior to delivery.

2. For a vaginal delivery remove prior to delivery when possible.

3. To remove the FSE:
    - Detach the FSE from the leg plate adapter cable
    - Grasp the electric wires as close as possible to the fetal presenting part and rotate the electrode counterclockwise until it is free from the fetal presenting part
    - Do not pull the electrode from the fetal skin
    - Inspect the electrode to ensure the spiral tip is attached to the hub
    - If separated, remove the tip from the presenting part using aseptic technique.

4. After delivery assess the point of insertion on the newborn. Cleanse the area with hospital approved soap and water. When transferring the newborn, inform the receiving nurse an electrode was used and identify the points of insertion.

## DOCUMENTATION

1. Document the following in the maternal health record:
    - Indications for the procedure
    - Results of the vaginal exam
    - Completion of the procedure including time start, time finish, attempts to apply and name of clinician applying the spiral electrode
    - Maternal response to the procedure (physical and/or psychological)
    - Interpretation of the fetal heart rate following application of the spiral electrode
    - Removal of the spiral electrode and how it was tolerated by the mom.

- Post-delivery assessment of insertion site on baby and document on baby's health record.

## REFERENCES

Dore, S. & Ehman, W. (2020). SOGC Clinical Practice Guideline No.396. Fetal Health Surveillance: Intrapartum Consensus Guide. *JOGC, 42* (3), 316-348**.**

Kendall Life Trace Product Description – Safelinc FSE 2100 Single Helix

Miller, D.A. 92020). Intrapartum fetal heart rate monitoring: Overview. Retrieved on November 17th, 2020 from https://www.uptodate.com/contents/intrapartum-fetal-heart-rate-monitoring-overview/print?search=fetal%20spiral%20electrode&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1

Phillips (2020) Fetal Spiral Electrode Packaging Instructions for Use: November 2020

Ross, M.G. & Beall, M.H. (2018). Scalp Lead placement. Retrieved on October 22nd, 2020 from https://emedicine.medscape.com/article/1998111-print

Simpson, K.R. & Creehan, P.A. (2021). **Perinatal Nursing.** 5th Edition. AWHONN: Lippincott Williams &Wilkins.

### ADDITIONAL DOCUMENTS

BC Women's Hospital (2016). Fetal Spiral Electrode (FECG) Policy WW 05.07. Fetal Maternal Newborn and Family Health Policy & Procedure Manual.

Champlain Maternal Newborn Regional Program (2016). Intrapartum Electronic Fetal Monitoring (EFM). Policy & Procedure.

## RELATED DOCUMENTS

### Policies

IWK Health Policy #124.1 – Consent to Treatment

IWK Health Centre Policy #7070 Intrapartum Fetal Health Surveillance

IWK Health Centre Policy #7114 Intellispace Perinatal (IPN) System

IWK Health Centre Policy #7172 Vaginal Examination

IWK Health Centre Policy #336 Optimizing and Expanding the Nursing Scope of Practice

### Self-Directed Learning Packages

IWK Health Centre Vaginal Examination SDLP

IWK Health Centre Fetal Spiral Electrode – Application and Management SDLP

## Appendices

Appendix A – Definitions

Appendix B – FSE Application and Set-up

# APPENDIX A – DEFINITIONS

**Artificial Rupture of Membranes**- also called amniotomy is when the amniotic sac is punctured to release the amniotic fluid. This is done mainly by using an amnihook.

**Authorized Prescriber** – a health care professional permitted by legislation, their regulatory college, NSHA, IWK, and practice setting (where applicable) to prescribe medications and treatments. The authority to order medication is not linked to any particular health profession, and may also differ within that health care profession depending upon specific competencies and skills. Examples of an Authorized Prescriber may include, but are not limited to, a physician, medical resident, and nurse practitioner, pharmacist with Additional Prescribing Authorization or midwives.

**Fetal Health Surveillance-** includes the assessment of fetal and maternal risk factors, stage of labour and labour progress, uterine activity characteristics, maternal heart rate, fetal heart rate characteristics, changes/trends over time, classification of the fetal health surveillance assessment findings and interpretation of findings in the light of the overall clinical picture.

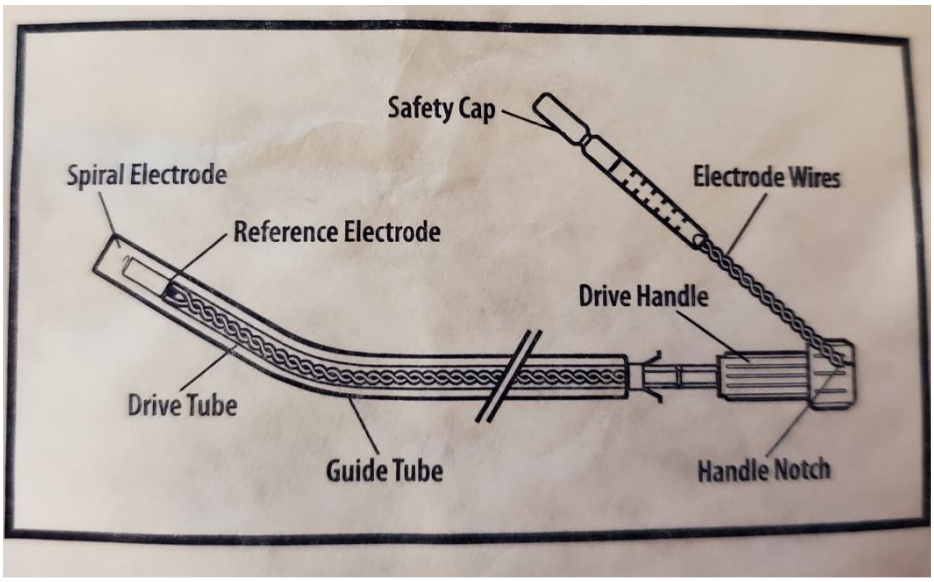
**Fetal spiral electrode (FSE)** – An electrode passed through the maternal vagina and cervix after rupture of membranes and applied to the fetal presenting part with a spiral wire to produce a display of the fetal heart pattern using fetal ECG. (SOGC, 2020)

**Internal monitoring** uses a fetal scalp electrode attached to the fetal scalp to record FHR; uterine activity is assessed using an intrauterine pressure catheter (IUPC). It is acceptable to use only one component of internal monitoring while externally monitoring the other component as long as a continuous tracing is obtained (e.g. FSE and external toco). Internal electronic fetal monitoring of the FHR or uterine activity may be considered with maternal obesity, dystocia, oxytocin doses greater than 30 milliunit/minute, labour augmentation in trial of labour after Cesarean delivery (TOLAC) and/or need for amnioinfusion. Relative risks and the benefits and wishes of the women should be carefully considered.

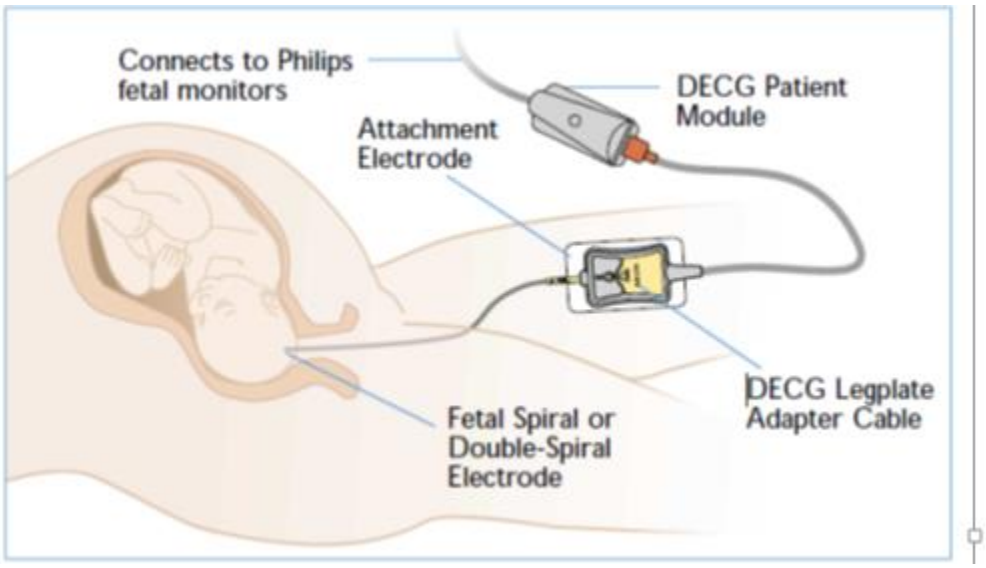
**Placenta Previa** – a clinical scenario where the placenta is located low in the uterus and might partially or completely cover the cervix.

**Vasa Previa –**when membranes that contain blood vessels connecting the umbilical cord and placenta lie across or near the opening of the cervix – the entrance to the birth canal. Vasa previa may cause massive bleeding in the fetus and mother when the membranes rupture.

# APPENDIX B – FSE APPLICATION and SET UP




*Adapted from Kendall Fetal Spiral Electrode Single Helix Packaging*




*Adapted from: Philips: Instructions for Use: Philips Fetal Spiral Electrode 989803137631*

## District Health Authority/IWK Policies Being Replaced

(Please List)

## Version History

(To Be Completed by the Policy Office)

| Major Revisions (e.g. Standard 4 year review) | Minor Revisions (e.g. spelling correction, wording changes, etc.) |
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