# OESOPHAGEAL HIGH RESOLUTION IMPEDANCE MANOMETRY - SCH

## PRACTICE GUIDELINE ©

## DOCUMENT SUMMARY/KEY POINTS

- This document is used for:
- To facilitate safe, efficient, and effective oesophageal high resolution impedance manometry for paediatric patients with possible disorders of oesophageal motility
- Patients should be assessed by a Gastroenterologist prior to referral for manometry

## CHANGE SUMMARY

- Document due for mandatory review. Minor changes made throughout the guideline.

## READ ACKNOWLEDGEMENT

Clinical Nurse Consultants, Registered Nurses and Paediatric Gastroenterologists, must have a clear understanding of this guideline.

Prior to undertaking procedures outlined in this guideline registered nurses must undertake local training

**Mandatory Read Acknowledgement**

- All Paediatric Gastroenterology nurses will read and acknowledge this document

**Discretionary Read Acknowledgement**:

- Head of Department *Gastroenterology* to determine which staff are to read and acknowledge the document.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.



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| **Approved by:** | SCHN Policy, Procedure and Guideline Committee | |
| **Date Effective:** | 1st November 2023 | **Review Period**: 3 years |
| **Team Leader:** | Clinical Nuese Consultant | **Area/Dept**: Gastroenterology SCH |

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This Guideline may be varied, withdrawn or replaced at any time.
NSW GOVERNMENT

# TABLE OF CONTENTS

# 1 Purpose

The purpose of this document is to facilitate performance of safe, efficient, and effective oesophageal manometry for paediatric patients with possible disorders of oesophageal motility at Sydney Children's Hospital Randwick.

# 2 Scope

This work instruction applies to all clinicians performing oesophageal manometry including nursing and medical staff.

# 3 Indications

Oesophageal manometry is an test that gives valuable information about oesophageal function which is not available from any of the other tests. High resolution manometry recordings with oesophageal pressure topography gives valuable information about oesophageal peristalsis, integrity of contraction and EGJ relaxation pressure [6]. It is indicated in the evaluation of patients with the following disorders where there is proven absence of mechanical obstruction, ulceration or inflammation in the oesophagus [5,6,7]

- Dysphagia – In patients where upper endoscopy is unrevealing, oesophageal manometry can diagnose an underlying oesophageal motility disorder.
- Gastroesophageal reflux disease (GERD) management – Oesophageal manometry excludes other diagnoses prior to anti reflux surgery. Note: oesophageal manometry is not diagnostic for GERD. Oesophageal manometry can also help evaluating dysphagia post fundoplication.
- Non cardiac chest pain – typically caused by GERD. If there is no response to management, oesophageal manometry may be performed to rule out a motility disorder.
- Impaired pharyngeal Swallowing – identification of patients where there is an aspiration risk during swallowing with disorders of pharyngeal contraction and upper oesophageal sphincter
- Rumination

Patients should be assessed by a Gastroenterologist prior to referral for manometry. An information leaflet and education should be provided to the patients and families prior to attendance outlining the preparation required, what to expect, risks and post procedure advice.

# 4 Equipment

- Personal protective equipment (PPE) including clean gloves as well as goggles and gown if splatter is likely
- Plastic bowl x 2 – medium size (x1 “clean”, x1 “dirty”)
- Clean towel or Bluey
- Tissues
- 10ml oral syringe
- Lubricating gel
- Cavilon Wipes and Remove Wipes
- Cup of water with straw
- SBM kit solution and thickener
- Clean beakers
- A slice of white bread
- A sandwich (rumination study)
- Tape + Hydrocolloid Dressing
- Scissors
- Manometry assembly


- Appropriate channel and size paediatric manometry catheter (see figure 1)
- Two-person procedure: One clinician performs the investigation including intubation and administering boluses. The other clinician documents.
- Check the sterilization record: Ensure the manometry catheter has been sterilised as per cleaning instructions (see below).
- Prepare test boluses (SBM kit = SBM Saline Concentration & SBM Thickened Liquid )

| | Thin | Mild | Moderate |
|---|---|---|---|
| 6 x Pumps of SBM Kit plus 200mL Water plus | Nil thickened liquid | 2 pumps of thickener | 4 pumps of thickener |

1. Thin fluid – 6 pumps of the SBM kit solution into 200mL water
2. Thickened fluid – 6 pumps of SBM kit solution into 200mL water in addition to the designated pumps of thickener. Stir for thirty seconds. Set aside for 5 minutes prior to use.
3. Solid – cut a slice of bread into 2cm x 2cm squares. Before giving the patient their meal, add a few drops of SBM solution +/- other toppings to each square. In addition the

families may bring in specific foods which result in dysphagia as instructed by the physician

4. For possible rumination: Have a sandwich/full meal available for the investigation

## 4.1 Set up of the manometry system (see figure 2)

1. Open the 'MMS database' program on the desktop
2. Search through the patient database for the patient. If they are not already registered, click 'New' on the toolbar and enter the patient's details
3. Connect the catheter to the computer using the grey cable.
4. Fill the 'clean' bowl halfway with water and place on the computer trolley.
5. Click on '**File'** then '**Utilities'** then '**Hardware Test USB'**.
   Select Module (Module 4) and zero all channels on pressure reading
6. Begin to press gently along the length of the catheter. If each sensor is working, a corresponding pressure band will appear on the screen. After completing these checks, immerse the catheter back in the bowl of water.
7. Return to Main screen, select the patient and click 'New Investigation' on the taskbar. In the pop-up window click 'Stationary.'
8. In the left column, select Protocol "Oesophageal HRIM" and on the right panel, select oesophageal manometry.
9. Once the screen is reading pressures, repeat the process of pressing along the length of the catheter. If each sensor is working, a corresponding colour band will appear on the screen. After completing these checks, immerse the catheter in the bowl of water.
10. Click the 'Zero all' button on the screen and leave the catheter in the water for 10 min to hydrate. Before intubation, zero all channels again.
11. <u>If the catheter is required to be removed from the patient, when reconnecting you should use the last zero function.</u>

## 4.2 Consent

- Consent for the procedure should be obtained
- Consent must be freely given, be specific to the procedure, informed and the patient must have the capacity to consent
- Parental consent must be in writing and adhering to SCHN Consent to Medical and Healthcare Treatment Manual

## 4.3 Documentation

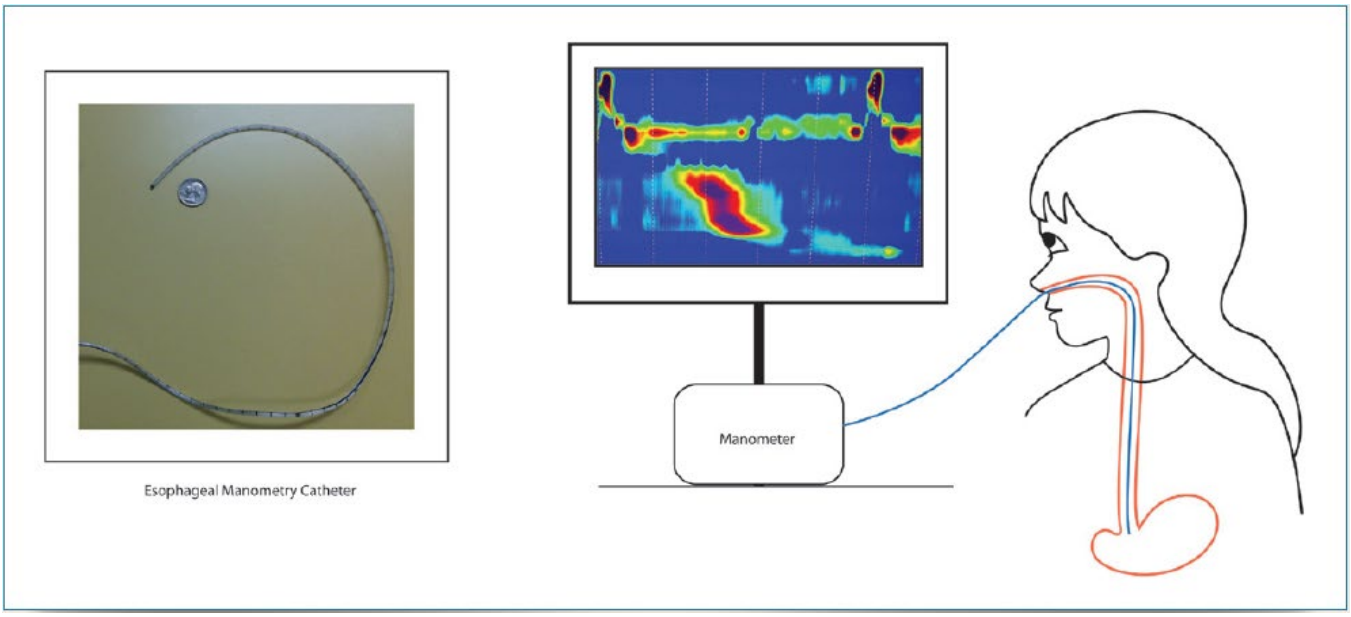
1. The referral must be reviewed by a Paediatric Gastroenterologist with motility training prior to the study
2. The child's current height and weight should be documented in the Growth Chart in EMR
3. Following the procedure additional documentation is required

## 4.4 Fasting

- Fasting is required for insertion and should be guided by the clinical nurse consultant.
- Fasting for a minimum of two hours is required before intubation to prevent vomiting and aspiration

## 4.5 Intubation

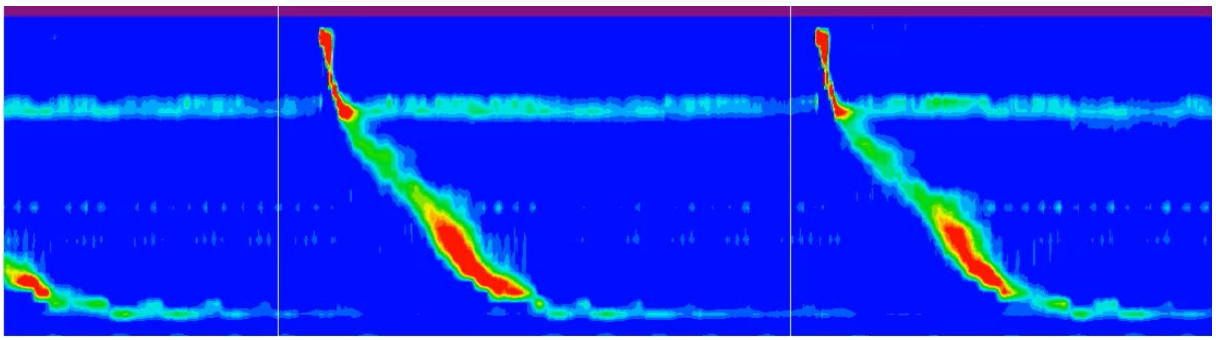
1. Explain the procedure to the patient, including expected sensations during intubation, length of time for the study, and the steps of the procedure as age and developmentally appropriate. Child life therapist or the Starlight team may be helpful for some children during the procedure.
2. Lubricate the end of the catheter with lubricating gel
3. Place a rectangular piece of hydrocolloid dressing by the chosen nostril.
4. To obtain an estimate of the Lower oesophageal sphincter (LOS), use **Strobel's formula** (Height in cm x 0.252) + 5 = LOS
5. Consider the age and developmental status of the child to determine the compliance and the use of child life therapy for distraction techniques
6. Tilt the head back and Insert the catheter slowly into the nostril until resistance is felt. Ask the patient to draw their chin to their chest sip water while gently inserting the catheter further. If resistance is felt, withdraw catheter back before attempting to re-advance. If resistance is still felt, attempt the other nare. Reconsider procedure if resistance is felt in both nostrils or child is uncooperative.
7. Advance the catheter until the estimated LOS position is reached. Check the position of the catheter on the manometry recording and adjust accordingly, with confirmation of proceduralist.
8. Once the catheter is in the desired location, tape the catheter to the tape already on the patient's face. In some instances an xray might be required to confirm position.



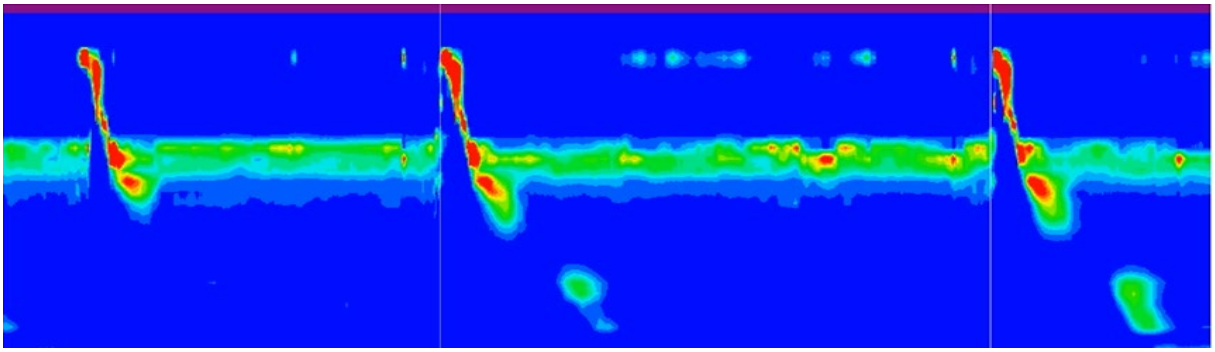

# 5 Manometry Study

## 5.1 Positioning of manometry assembly

***Oesophageal***: The pressure band for the LOS should be at the bottom of the screen.



***Pharyngeal:*** The pressure of the pharynx above the Upper Oesophageal Sphincter (UOS) should be seen below the top of the screen



- If unsure of the position, seek advice from one of the Paediatric Gastroenterologists.
- Once satisfied that the catheter is in the correct position and secure, press 'Start Recording' on the computer. The catheter depth should be documented on MMS software

## 5.2 Standard motility tests are below.

These are subject to change at the discretion of the Paediatric Motility Gastroenterologist depending on the specific patient and suspected motility problem. Any additional events (swallows, burp, pain, etc.) should be entered onto the computer.

- Observe for 1 min with minimal swallowing to measure baseline LOS pressure
- 10 x 5mL SBM swallows: Administer 5mL of SBM via syringe. Instruct the patient to swallow aloud when asked and mark each swallow on the computer.
- Multiple rapid swallows (compliant patient): Administer 1mL of solution via syringe every few seconds. Instruct the patient to swallow aloud when asked. Alternatively provide a cup and straw and instruct the patient to finish contents of the cup in one sitting.
- 10 x 5mL thick swallows: Administer 5mL of thickened SBM. Instruct the patient to swallow aloud when asked
- 10 solid swallows (2cm square of bread): Place a few drops of SBM on each 2cm piece of bread with +/- other toppings . Instruct the patient to swallow aloud and indicate when they swallow so this can be documented on the computer.
- Investigations specifically for rumination: The patient should be given a small meal such as a sandwich. Continue the manometry recording for one hour post completion of the meal. During this time, the patient should be undisturbed as much as possible while the clinician documents observed or patient reported symptoms.

## 5.3 Documentation on the manometry computer

- Use the buttons on the screen above the tracing to mark each swallow and the nature of the bolus (liquid, thickened liquid or solid bolus)
- Use the 'Comments' button to mark specific events such as the following
    1. Catheter position changes
    2. Gagging
    3. Coughing
    4. Crying
    5. Belching
    6. Vomiting
    7. Reflux symptoms
    8. Volume and type of boluses

# 6 Cleaning

- At the completion of the study the catheter may be gently removed and the recording stopped. Upon removal, place the catheter in the ‘dirty’ bowl.
- Apply gloves and rinse under warm water for 1minute. Wipe Catheter on completion with a soft tissue. Do not use alcohols or disinfectants, or any rough corrosive type of wipe.
- Send to CSSD and record in log book.

## 6.1 Documentation

- Ongoing documentation should be performed throughout the study on the manometry equipment as outlined above.
- Following the procedure, the procedure should be documented in the EMR notes including the following details including parenteral verbal consent, distractions utilised and toleration of the procedure.

# 7 References

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