Neuroscience Nursing Primer

Intraparenchymal Monitoring (IPM)

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CONDITION/SKILL OVERVIEW

This quick guide was developed to provide a reference for bedside care and should be used in conjunction with the Intracranial Monitoring Evidence-based Clinical Review.

If you have not managed a patient with intraparenchymal monitoring (IPM), it is important to seek guidance from experienced staff and other evidence-based resources.

The most common IPM device is often called a “bolt”. This fiberoptic catheter is placed into the parenchyma via an introductory bolt and measures Intracranial pressure. Less common are hybrid types that can also drain cerebral spinal fluid (CSF) and measure brain temperature, which are covered in the EVD quick guide. This guide does not replace your institutional guidelines for placement and management.

GENERAL SAFETY CONCERNS

- Guard against dislodgement of bolt and fiberoptic catheter. Secure with tape as needed as fiberoptic lines may be easily pulled out of the bolt. Some institutions may also place a depth marking on the device to provide a visual indicator of displacement such as marker or tape.
- Monitor waveform for dampening. There is no way to re-zero monitor after insertion.
- Fiberoptic catheters may “drift” from zero over a few days. Always rely on your patient assessment to monitor the patient’s condition.
- If traveling, refer to institutional recommendations. Dislodgement of the catheter is not uncommon. Some fiberoptic catheters are not MRI compatible.

GENERAL SAFETY CONCERNS (Cont.)

- Discussion with the team about risk vs benefit and orders for travel. Nurse should accompany unstable patients when off the unit using a travel monitor to monitor ICP.

INSERTION AND PLACEMENT OF THE IPM

***This is a sterile procedure that may occur in the ED, OR, or ICU.** Shared responsibilities for provider and bedside nurse for placement include: patient prep, gathering supplies, monitor set up, *completion of pre-procedure check list*, verification of an informed consent, coagulation laboratory values, and preprocedural medications. Check with the provider or team if you are not familiar with your role.

Supplies

- Cranial access kit
- Bedside monitor
- ICP monitor box
- Pressure cable and module
- Electric or disposable clippers
- Sterile prep kit / antimicrobial scrub (2% Chlorhexidine)
- Sterile gloves, gown, mask, cap, drapes

Patient Preparation and Insertion

1. Check coagulation labs as indicated. INR: between 1.2-1.6.
2. Set up sterile trays and supplies for device insertion.
3. Don sterile PPE if assisting with IC catheter insertion.
4. Prep insertion site according to institutional sterile or aseptic technique.
5. Drape the head, neck.
6. Assist with attaching hemodynamic system maintaining aseptic technique – zero monitor, observe ICP and waveform. Confirm placement and waveform and reading with provider.

Obtain orders for HOB, alarm parameters and ICP goals.

IPM SITE CARE

The literature does not recommend specific dressings or routine dressing changes. Check institutional policies. If dressing changes are necessary, sterile or aseptic technique should be employed for dressing changes. Change dressing only as needed, when no longer occlusive or if soiled. Target infection rate is 0. Not to exceed 1-2%.

Supplies

- Sterile dressing change kit & dressing
- Sterile gown, gloves, cap, mask, and drape

Procedure

1. Set up sterile/aseptic dressing change kit.
2. Don clean gloves. Remove non-secure/soiled dressing.
3. Perform hand hygiene.
4. Don sterile PPE.
5. Change dressing according to institution protocol.
6. Document assessment of site, time and date dressing change.

NURSING CARE

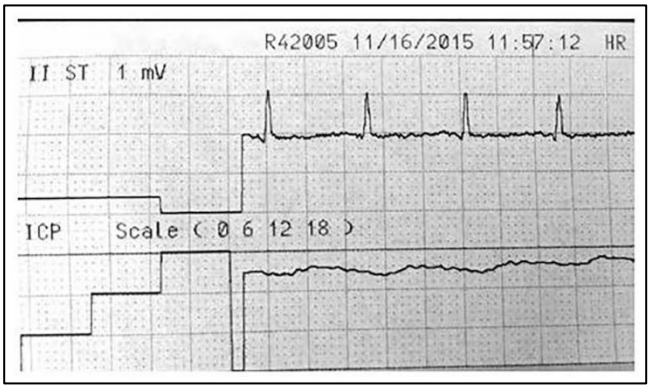
Zeroing IPM monitoring device

Refer to monitor specific zeroing protocols, not all monitoring systems will require zeroing.

If required, zeroing is generally completed prior to initial insertion. An assistant to the provider will watch for the waveform on the monitor to fully level to zero prior to the intrathecal catheter being inserted by the provider.

Troubleshooting ICP monitoring device

- For dampened waveform (see image below of zeroing and dampened waveform – lower line on strip), check placement of the catheter and mechanical impediment.
- When troubleshooting, always remember to perform neuro assessment for damped waveform. Assess the patient, not just the monitor.



- Fiberoptic catheters may “drift” over time, but there is no re-zeroing after insertion.
- Assess the lines for damage or defect.
- Temporary obstruction of external carotid causes increase in ICP, if the external carotid is compressed and ICP does not change, troubleshoot for mechanical issue.
- Increased amplitude waveforms have numerous etiologies that can be reflective of in vivo conditions. Refer to AANN Core Curriculum for additional trouble shooting.

Monitor removal

1. Not to be removed by RN. Removal solely by medical provider.
2. Set up removal kit.
3. Place patient in semi-fowlers position.
4. Disconnect from monitor.
5. Assist provider with removal and site dressing.
6. Monitor for signs of drainage or infection.

PATIENT/FAMILY EDUCATION

Provide families with education about IPM, importance of positioning and safety concerns including infection risks associated with touching of the site. Place signage in the room as reminders to patients, family, and other staff.