Checklist: Insertion and Setup Codman Microsensor™ (intraparenchymal or ventricular drain)

Before you begin:

1. Contact neurosurgery to identify which Codman Microsensor™ ICP they will be inserting. Obtain the correct catheter (see Checklist Selection of ICP Catheter and Monitoring Equipment).

2. If a ventricular drain will be inserted, you will also need to setup a drainage collection unit. Obtain Codman EDS 3™ CSF drainage collection unit and set it up as per Checklist: Setup of Codman EDS 3™ CSF Drainage Unit.

The catheter type will define the equipment requirements and preparation needed.

Assist with Insertion and Setup of Codman Microsensor™ and Codman Express™ Using Either the Intraparenchymal or Ventricular catheter.

1. Obtain supplies for insertion and setup of Codman Microsensor™ catheter

   Procedural
   - Ventricular Insertion Drainage Tray (ensure drill is packaged with tray)
   - Hair clipper with clipper head
   - Line cart
   - Sterile gowns
   - Large sterile drape and sterile towels
   - Local anaesthetic
   - Tegaderm™ dressing

   Microsensor and Bedside Display
   - Correct Codman Microsensor™ catheter (intraparenchymal or ventricular)
   - Codman Express™ with microsensor cable attached to front and bedside monitor cable attached to back
   - Philips bedside pressure module for displaying ICP (this can be any available module; an add on module may be required if the 3 standard modules are in use)

   Ventricular Drainage
   - If ventricular drain is being inserted, have a primed Codman EDS 3™ ready Checklist: Setup of Codman EDS 3™ CSF Drainage Unit.
PART A: HOW TO ZERO THE CODMAN MICROSENSOR™ PRIOR TO INSERTION

For both Codman Microsensor™ Catheters

1. Turn on the Codman Express™

   - Place Codman Express™ on IV pole and plug into red electrical outlet.
   - Turn the Codman Express™ on. Listen for audio beep.
   - Be sure to remove any label with previous reference code from device.

2. Connect the Codman Microsensor™

   - Assist neurosurgeon to prepare sterile field and open Codman Microsensor™ catheter
   - Neurosurgeon passes the white microsensor connector for connection to the grey Codman Express™ cable (plugged into the front of the Codman Express™ (Figure 3).
As soon as cable is connected, “Transducer Detected” will appear on the screen (Figure 5).

Provide physician with a syringe of sterile saline. This will be used to fill the catheter tray and submerge the tip of the catheter during zeroing.

Neurosurgeon holds the catheter steady in a horizontal position, submerged in 3 inches of sterile saline (Figure 6).

Figure 5: Transducer has been recognized

Figure 6: Submerge catheter horizontally under sterile saline
While catheter is held steady, nurse presses the blue “Zero Transducer” button when prompted (Figure 7).

- **Figure 7: Press blue “Zero Transducer” button**

When zeroing is completed, a 3 digit reference number will display.

- **Figure 8: Identify reference code and complete zeroing**

- **Document the 3 digit reference number in the Kardex and Al record.** Record the number on a removeable label with a Sharpie and affix to the top of the Microsensor™. This reference code will be required any time the catheter is disconnected.
- **Press “MENU/ENTER” to complete the zeroing.** *The physician can proceed with catheter insertion.*
PART B: PROCEDURE FOR CONNECTING THE CODMAN EXPRESS™ TO PHILIPS™ MONITOR:

The Codman Express™ can be connected to the bedside monitor prior to insertion as shown in Part B.

For both Codman Microsensor™ Catheters

ICP is measured by the Codman Express™. This pressure can be duplicated on the Philips™ monitor for the purpose of generating an ICP waveform.

If there is a discrepancy between the pressures on the 2 devices, the Codman Express™ is the source of truth.

1. Select a pressure module for ICP monitoring. Use a spare pressure module on the MMX Extension (highlighted in green) or a single pressure add-on.

   ![Figure 9: Identify a spare module](image)

2. Connect the Codman Express™ to the Philips™ monitor

   Connect the Philips cable. The cable is kept connected to the back of the Codman Express™.

   ![Figure 10: The monitor cable should remain attached to the back of the Codman Express](image)
3. **Activate/enable the pressure module.**

Touch the “xylophone” keys.

*Figure 11: Philips ICP cable plugged into single module. The pressure cable has a different connection (white) than other Philips cables (grey).*

*Figure 12: Select the xylophone key*
Examine the labels for each pressure module. The same label can only be active on one module at a time. To make the module live, it must have a unique label.

To change the label, touch on the module. If two modules have the same label, you have to disable one and give it a new name.

**Figure 13:** Touch the module that you want to label

**Figure 14:** Deactivate old label
Figure 15: Choose change label

Figure 16: Scroll to the desired label and select, then choose activate
4. When the following prompt appears, press the zero on the Phillips pressure module. (Note that you do not need to open any stopcocks or adjust the position of any tubing or devices). This prompt should appear as soon as the cable is connected. If it does not, press the white “0 zero patient monitor” button.

![Figure 17](image17.png)

**Figure 17:** This prompt tells you to select the zero on the pressure module

5. Confirm that the reference line for the ICP waveform is displaying zero and the reference line is along the zero baseline. This can take a few minutes. If zero is not achieve, try again.

![Figure 18](image18.png)

**Figure 18:** Zeroing

![Figure 19](image19.png)

**Figure 19:** Confirm Zero
6. The following screen will appear. Press "20" to send a calibration signal to the monitor (do not use 100, this is a European calibration code). **Select the white “20” box on the monitor.**

![Image of calibration screen]

**Figure 20:** Send calibration signal "20"

7. A calibration pressure of 20 mmHg is sent to the bedside monitor. Observe the bedside monitor until the pressure reaches 20. This can take several minutes. If the pressure doesn't reach 20, repeat the procedure. If the monitor does not calibrate, notify Biomedical Engineering.

![Image of calibration screen with pressure 20]

**Figure 21:** When pressure reaches 20, calibration has been achieved.
7. Press the **white menu button** to confirm that the monitor displays 20 mmHg. This will complete the calibration. If the monitor does not display 20 mmHg, use the arrows to adjust the value before completing.

![Figure 22: Confirm calibration and select "Menu"](image)

**Codman Express Operation:**

- An LCD switch is located on the back of the ICP Express to see screen in the dark
- Alarms are automatically off when ICP express is turned on. To activate alarms go to menu/enter button, choose on/off alarm limits option and activate alarm option by arrowing up or down for required limits. You only need to set the Codman Express™ alarms if the patient is not connected to the bedside monitor. Set the bedside alarms when connected.

**Troubleshooting**

- When zeroing the ICP Express monitor, if the value -99 appears this means the grey cable that connects to the front of the ICP Express monitor needs to be replaced
- If you attempt to zero the bedside monitor by selecting the “zero patient monitor” button on the Codman express and nothing changes, check to ensure the cable from the Codman express is connected into a Philips pressure module
- If a zero reference number appears before zeroing, turn ICP Express off and restart steps

**Traveling and the Microsensor**

- Disconnect catheter from grey cable attached to ICP Express
- When reconnecting catheter to ICP Express, you must confirm that the reference number is correct. If it is not, use arrows to adjust the reference until it is correct
- The Codman Microsensor™ is MRI compatible
- Maintain the correct level of the drainage unit during transport. The Codman EDS 3™ drain should only be turned of if the drain must be dropped below the level of the patient’s head. Reposition as quickly as possible and restore the drainage level. Movement and repositioning may cause an additional rise in the ICP, making drainage very important.
PROCEDURE FOR MONITORING ICP WITH STANDARD VENTRICULAR CATHETER:

ICP is measured with standard transducer and fluid filled circuit.

- After priming the Codman EDS3, connect the pressure transducer cable to a spare bedside Philips™ module
- Change the Module label to “ICP” as previously described
- Tape the pressure transducer to the back of the Codman EDS3 aligning the stopcock from the transducer with the zero reference stopcock on the Codman EDS3.
- Confirm that the stopcocks are level with the patient’s external auditory canal using a laser level
- Zero the Philips transducer as you would zero an arterial pressure line
- Fluid filled monitoring will be affected by blood or particles in the drainage tubing
- When measuring pressure using a fluid filled system, you MUST TURN THE PATIENT STOPCOCK “OFF” TO DRAINAGE FOR 1 MINUTE TO OBTAIN AN ACCURATE PRESSURE

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