

## TRANSPORTING A PATIENT WITH AN ICP MONITOR AND/OR DRAINAGE DEVICE

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### 1. HOW TO MANAGE THE CODMAN MICROSENSOR™ DEVICE (EVD OR INTRAPARENCHYMAL)

#### LEAVING CCTC FOR CT OR MRI

The Codman Express™ is usually disconnected and left in CCTC when patients go for CT or MRI. For patients with an EVD, pressure can usually be controlled by the level that the drainage collecting chamber is positioned. However, for patients with an intraparenchymal pressure monitoring device, there is no drainage option.

Prior to transporting a patient, confirm with Neurosurgery that the patient can be safely disconnected during transport.

Note that a patient can be connected to a different Codman Express™ unit – the reference code is specific to the catheter (not the Codman Express™ unit).

The patient **MUST BE DISCONNECTED** from the Codman Express™ for MRI.

Immediately prior to transporting the patient, disconnect the Microsensor™ cable as shown in Figure 1. The reference code should be recorded in permanent black ink on the Microsensor™ (done upon insertion). It should also be recorded in the ICP Catheter grouper on the date of insertion).

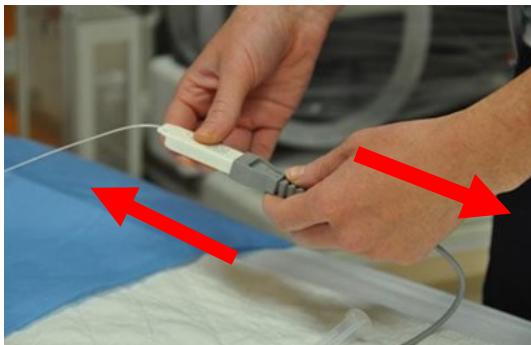


Figure 1: Disconnect Microsensor™

## FOR MRI ONLY:

Go to the [How to Coil the Microsensor™ for MRI](#) and coil the Microsensor™ as shown in the instructions.

## RETURNING TO CCTC

**NEVER press the blue zero button at any time other than PRIOR TO initial insertion (see #3).**

1. Reconnect the Microsensor™

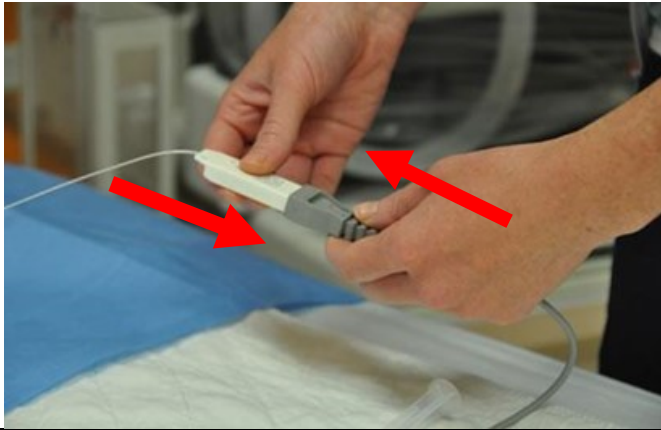


Figure 2: Reconnect Microsensor™

2. The reference code should automatically appear. Confirm that this is the correct reference as recorded on the white Microsensor™ or in the ICP Grouper. Adjust the reference code if required. A different Codman Express™ can be used, the reference code is specific to the Microsensor™ catheter, not the Codman Express™ unit.
3. **NEVER press the blue zero button.** During operation, this will be inactive, but it becomes available when you reconnect the Microsensor™ (the Codman Express™ assumes you are inserting a new catheter and performing the initial pre-insertion zero).

If you select the blue button after the initial zeroing, it will record the current pressure as zero. Consequently, if the patient has a pressure of 25 mmHg and

you select the blue zero button during reconnection, the device will always display a pressure that is 25 mmHg below the true measurement.

4. Rezero the bedside monitor as shown in the steps below:



Figure 3: Step One. Proceed to the bedside monitor will display - iff this option does not appear, select the WHITE “zero patient monitor” option to send a 0 mmHg signal to the bedside monitor.

When Proceed to Zero Patient Monitor is displayed, select the zero option on the PHILIPS™ monitor for the ICP module. You do not need to position any part of the monitoring circuit level to zero the Philips™ monitor to the Codman Express™ The Codman Express™ sends a pressure of zero to the Philips monitor for confirmation.



Figure 4: Step Two. Confirm that the bedside monitor displays a pressure of zero and shows an isoelectric line along the zero scale. If it does not, repeat the zeroing steps selecting the WHITE “zero patient monitor” option, then zero the Philips™ monitor.



Figure 5: Step Three. When prompted, select “20” on the Codman Express™. This sends a calibration pressure of 20 mmHg to the bedside monitor.



Figure 6: Step Four. Confirm that the Philips™ monitor is displaying an ICP of 20 mmHg. This can take several minutes. If it does not confirm 20 mmHg, repeat until 20 mmHg is displayed and the isoelectric line corresponds to a pressure of 20 mmHg.

Remember – we send the pressure to the Philips™ monitor to produce a waveform. The pressure is measured by the Codman Express™ and the Philips™ is a “copy”. If there is a difference between the Codman Express™ pressure and the Philips™, the Codman Express™ is the source of truth. There must be a problem between the Philips™ cable, module or zeroing/calibrating of the monitor.

If the numbers appear erroneous (negative numbers is an example, or drainage when the pressure is lower than the drainage collection chamber setting), the catheter may have been disconnected and the blue zero button selected in error.

If this occurs, the pressure measurement error is irreversible – the only solution is to revert to fluid filled pressure monitoring. There is no solution for an intraparenchymal catheter that has been erroneously rezeroed.

## 2. HOW TO MANAGE AN EXTERNAL DRAINAGE UNIT DURING TRANSPORT

- DO NOT turn the drainage unit off for transport – **transport and movement of the patient may increase intracranial pressure and keeping the drainage unit open provides brain protection against high ICP.**
- Never lay the drainage collection unit flat – keep it upright on a pole.
- Make sure the team waits during patient movement and preparation on the CT table for you to reposition the drain.
- The greatest risk associated with leaving the drain open occurs if the drain is lowered below the desired drainage level. This can lead to excess drainage – rapid removal of excess CSF can cause intracranial hypotension which increased CSF production and can cause cerebral bleeding.
- If the drain is higher than the desired level, it is the equivalent of clamping.
- When moving the patient from bed to stretcher, particularly if the drain may be lower than the patient, temporarily turn it off until the patient's position is stabilized. As soon as the patient is repositioned, reposition the drain and return it to the open position.
- Monitor for drainage – when drainage occurs at the ordered level, it indicates that the ICP has risen above that level (and the drain is appropriately protecting the brain).
- If the drainage does not occur when ICP is elevated above the level of the drainage unit, the catheter could be blocked or clamped, the tip may be outside the ventricle, or the pressure may be elevated without an accumulation of CSF (commonly due to severe cerebral edema).

## 3. HOW TO MANAGE AN EXTERNAL DRAINAGE UNIT DURING TRANSPORT

- Fluid filled pressure monitoring can be transported the same way that we would transport an arterial pressure monitoring device.

September 22, 2023 (Brenda Morgan, CNS, CCTC)