

When *Reliability* and *Accuracy* matter...



CODMAN ICP EXPRESS[®]
Monitoring System and
CODMAN[®] MICROSENSOR[®]
ICP Transducer

The many features of the CODMAN MICROSENSOR transducer include:

Accuracy

Various studies have been performed on the CODMAN MICROSENSOR transducer^{1,2,3}, demonstrating a high degree of accuracy in subdural, parenchymal and intraventricular ICP monitoring. The graphs in Figure 1 summarize the results from one of these studies³ and demonstrate a high correlation between the CODMAN MICROSENSOR subdural, parenchymal and ventricular pressure versus standard ventricular fluid pressure as measured with an external transducer.

High Fidelity

The fidelity of the CODMAN MICROSENSOR transducer is greater than 10,000Hz, allowing for excellent ICP waveform analysis. The CODMAN MICROSENSOR fidelity was evaluated in a study demonstrating pulsatile characteristics of high fidelity and greater magnitude than corresponding ventricular pressure pulse³. The graphs in Figure 2 illustrate these results.

Minimal Drift

The stability of the CODMAN MICROSENSOR transducer has been tested in a variety of studies^{1,2,3}.

STABILITY TESTS	
Time	Drift
4 Days	avg. 0.2 ± 0.5mmHg
6 Days	avg. 0.75mmHg
9 Days	max. 1.0mmHg

One study showed a maximum drift of 1mmHg total over nine days of monitoring, with the majority of the sensors exhibiting no drift during the entire monitoring period¹.

Better Data, Better Decisions... The CODMAN MICROSENSOR ICP Transducer

The CODMAN MICROSENSOR ICP Transducer consists of a miniature strain gauge pressure mounted in a titanium case at the tip of a 100cm flexible nylon tube. The CODMAN MICROSENSOR transducer monitors intracranial pressure directly at the source – subdural, parenchymal or intraventricular. Information is relayed electronically rather than through a hydrostatic column or fiberoptics.

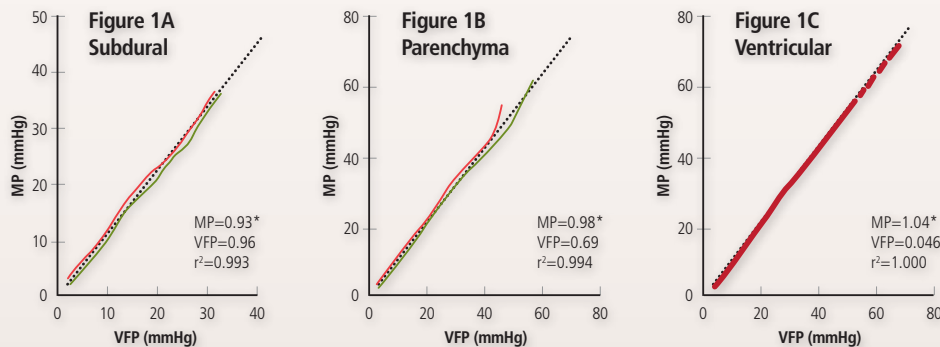


Figure 1: Comparison of CODMAN MICROSENSOR pressure placed in the (a) subdural space, (b) parenchyma and (c) ventricular fluid pressure versus standard ventricular pressure as measured with an external transducer.

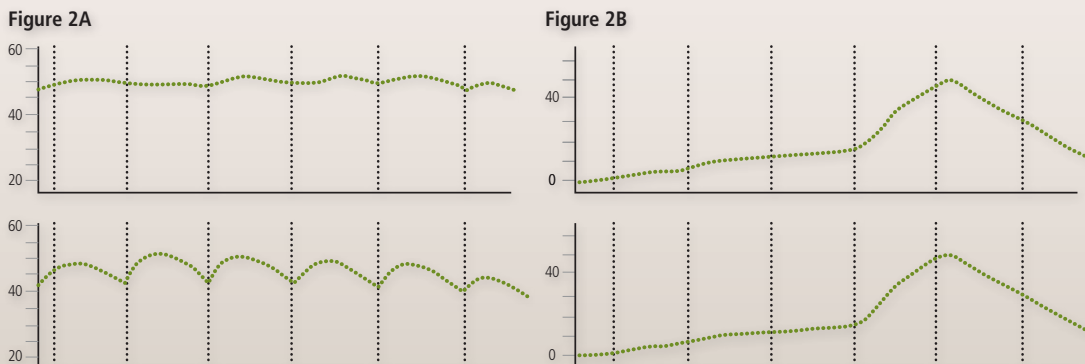


Figure 2: Pulsatile characteristics of the CODMAN MICROSENSOR transducer (MP) placed in the brain tissue demonstrated high fidelity and greater magnitude than corresponding ventricular fluid pressure (VFP) pulse, indicating a wide dynamic range (Figure 2a). The similarity between VFP and MP pressure during a typical pressure cycle is shown to the left.

In addition, the CODMAN MICROSENSOR transducer offers:

Direct Pressure Monitoring at the Source

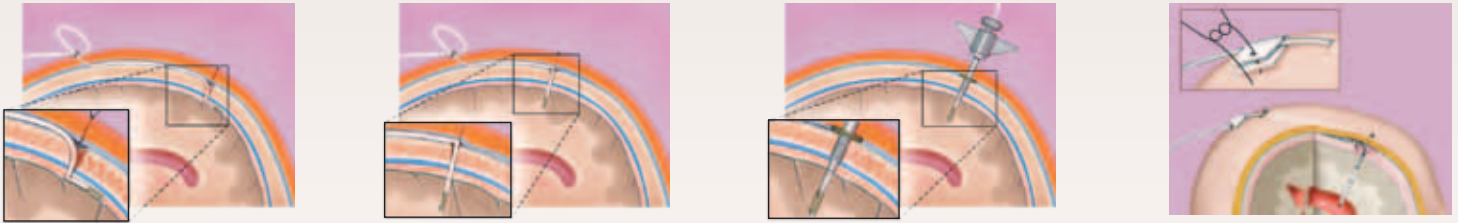
Several procedural kits are available, each offering direct monitoring at the source – subdural, parenchymal or intraventricular.

Small, Flexible and Low-Profile

The small size and flexibility of the CODMAN MICROSENSOR nylon tubing allows for low-profile tunneling under the scalp and kinking of the nylon catheter without breakage or monitoring disturbance.

Elimination of Maintenance Requirements Associated with Fluid Coupled Systems

The CODMAN MICROSENSOR transducer eliminates the need for constant alignment of the transducer to the patient's head and periodic rezeroing. False readings associated with obstructions, air bubbles or movement of the patient fluid lines are no longer a concern.

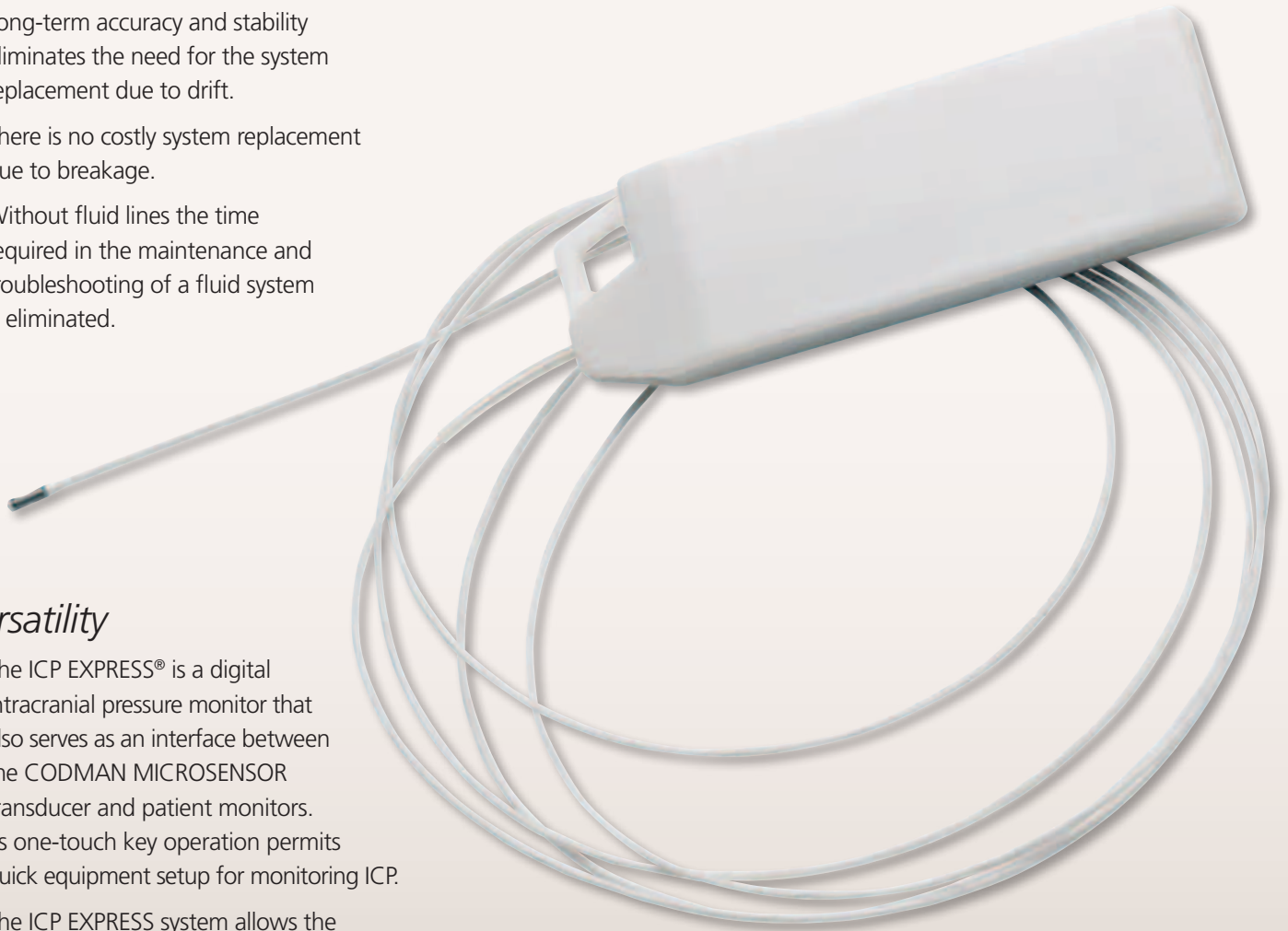


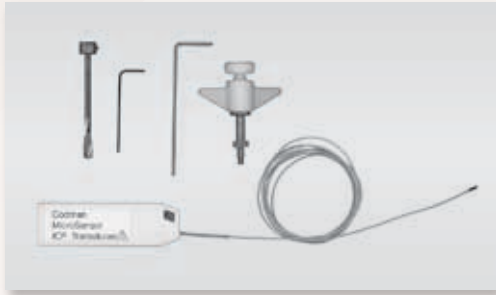
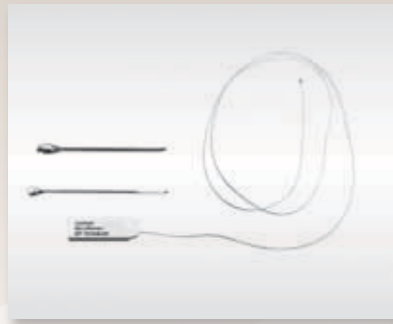
Cost-Effectiveness

- Long-term accuracy and stability eliminates the need for the system replacement due to drift.
- There is no costly system replacement due to breakage.
- Without fluid lines the time required in the maintenance and troubleshooting of a fluid system is eliminated.

Versatility

- The ICP EXPRESS® is a digital intracranial pressure monitor that also serves as an interface between the CODMAN MICROSENSOR transducer and patient monitors. Its one-touch key operation permits quick equipment setup for monitoring ICP.
- The ICP EXPRESS system allows the CODMAN MICROSENSOR transducer to interface with a wide variety of patient monitors permitting movement of patients throughout the hospital.





Ordering Information

ICP EXPRESS

82-6634	ICP EXPRESS 117v – includes one ICP EXPRESS with pole clamp and one ICP EXPRESS Transducer Cable
82-6636	ICP EXPRESS Transducer Cable

CODMAN MICROSENSOR

82-6631	CODMAN MICROSENSOR Basic Kit
82-6638	CODMAN MICROSENSOR Skull Bolt Kit
82-6653	CODMAN MICROSENSOR Ventricular Catheter Kit

Cranial Access Kits

82-6612	Cranial Access Kit (razor-free with sodium chloride and XYLOCAINE®)
82-6614	Cranial Access Kit (with sodium chloride and XYLOCAINE®)
82-6616	Cranial Access Kit (without sodium chloride and XYLOCAINE®)

REFERENCES

1. Koskinen L, Olivecrona M: Clinical Experience with the Intraparenchymal Intracranial Pressure Monitoring Codman Microsensor System. *Neurosurgery* 56: 693-698, 2005.
2. Gopinath S, Robertson C, Contant C, Narayan R, Grossman R: Clinical Evaluation of a Miniature Strain-Gauge Transducer for Monitoring Intracranial Pressure. *Neurosurgery* 36: 1137-1141, 1995.
3. Marmarou A, Tsuji O, Dunbar J: Codman White Paper. 1994.

PATIENT MONITOR INTERFACE CABLES

To order cables for connection with your patient bedside monitors, contact your Codman Neuro Specialist sales representative.

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CSF Drainage

82-1731	CODMAN EDS 3® CSF Drainage System
82-1732	CODMAN CSF Drainage System Replacement Collection Bags
82-1733	CODMAN EDS 3 Laser Leveling Device

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