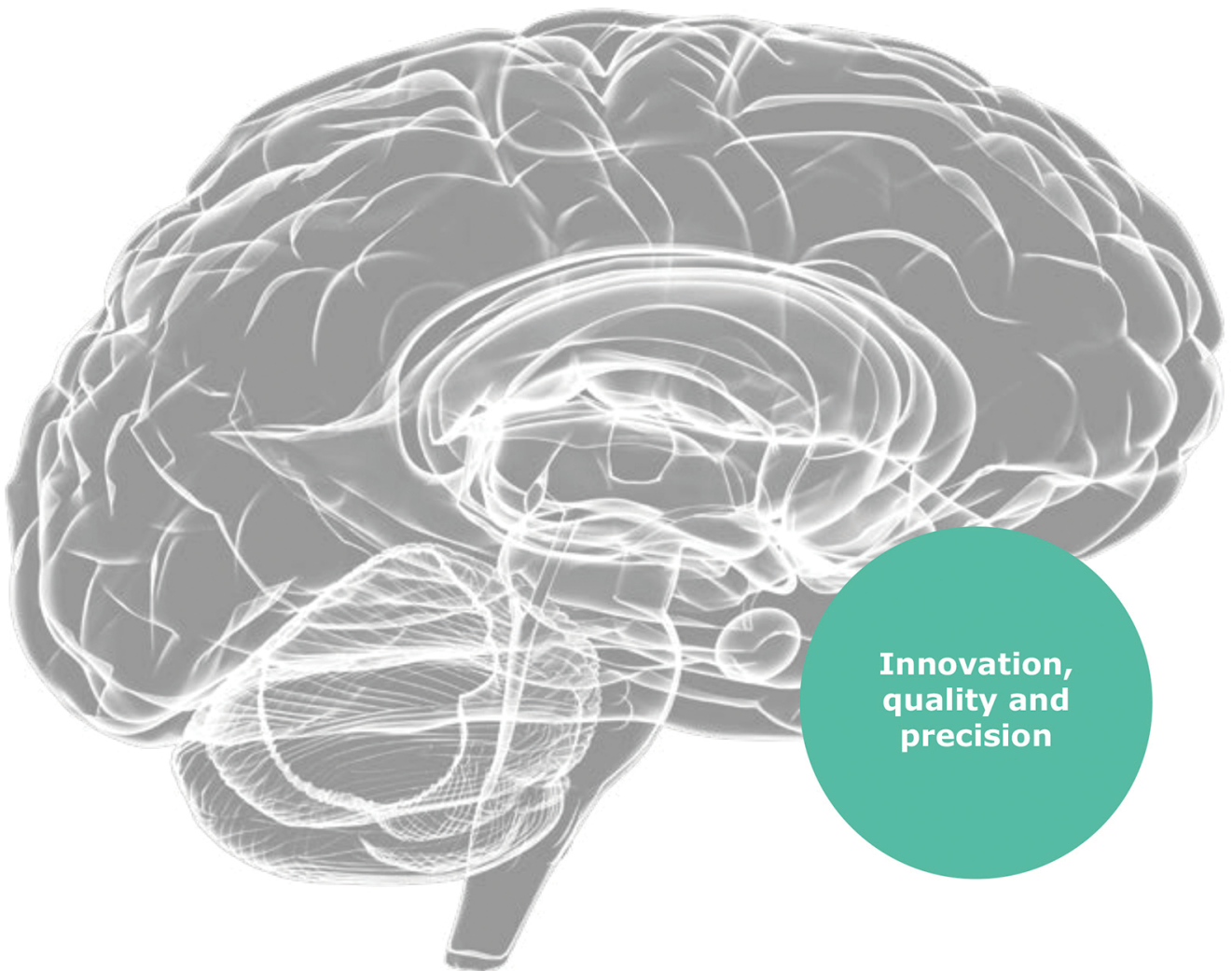


Cutting-edge development and manufacturing excellence - made in Germany

# ICP- and CSF-Products



**Innovation,  
quality and  
precision**



Stefan Paschko  
Spiegelberg Managing Director

Dear customers

Spiegelberg was established in 1986 in Hamburg and today supports customers in more than 40 countries worldwide, where medical services rely on our **innovative neurosurgical devices** and the **quality of our research and manufacturing – Made in Germany.**

Spiegelberg's understanding of „Technology for brains“? Genuine pioneering work. Our mission is to simplify your day-to-day medical work with our enthusiasm for innovation and our passion for medical technology.

Our close **cooperation with well-known research institutions and leading hospitals and specialists in the field of neurosurgery** enables us to supply high-quality medical devices that are designed precisely to meet the demanding requirements of your everyday medical work.

**The quality assurance of all our developments, our services and our marketing** of intracranial pressure measuring devices, cerebrospinal fluid management devices and additives is based on our **DIN EN ISO 13485 certificate!**

Have a look at this brochure for an overview of our high-quality products, such as ICP-Monitor, ICP-Probes, Catheters and EVD-Kits as well as IAP-Catheters.

With kind regards,

A handwritten signature in blue ink, appearing to read 'Stefan Paschko', written in a cursive style.

Stefan Paschko  
Spiegelberg Managing Director

## ICP-Monitor HDM 29.2

The Spiegelberg Intracranial Pressure (ICP) Monitor is used to monitor ventricular, parenchymal and epidural pressures. The ICP-Monitor can also be used in conjunction with Spiegelberg's IAP-Catheter to monitor intra-abdominal pressure.



The air-pouch system consists of a hollow synthetic core and a tube filled with < 0.15 ml of air. The pressure sensor is integrated within the ICP-Monitor alongside the measuring electronics and a provision for filling the air-pouch system.

The ICP-Monitor HDM 29.2 is fitted with a rechargeable battery and can be operated autonomously off-the-grid for up to six hours.

### Advantages of the Spiegelberg ICP-Monitor: HDM 29.2

- Plug-and-Play Function
- Continuous measurement
- Automatic hourly re-calibration<sup>1</sup>
- Compatible with all standard patient monitors

### Note

Spiegelberg also supplies the appropriate interconnecting cables for connecting to standard patient monitors. Feel free to contact us for any further information.

<sup>1</sup> Integrated monitor null adjustment; no metrological calibration.

<sup>2</sup> Reference: Clinical Evaluation of the Intraparenchymal Spiegelberg Pressure Sensor, Congress of Neurological Surgeons, June 2003.



## ICP-Monitor to measure intracranial pressure

The Spiegelberg ICP-Monitor features a convenient plug-and-play function. After inserting the air-pouch probe, the probe is simply connected to the monitor and starts to calibrate automatically<sup>1</sup> once the monitor is switched on. The latest ICP-Monitor from Spiegelberg has rechargeable batteries with a running time of up to six hours. The ICP-Monitor is compatible with most standard patient monitors.

## Accurate measurement results and data analysis

Spiegelberg's ICP-Monitor provides accurate measurement results thanks to regular, automatic re-calibration<sup>1</sup>. In one clinical study<sup>2</sup>, for example, a maximum drift of only +/- 2 mmHg over a period of up to 28 days could be confirmed. A digital interface allows measured values to be transferred to a PC for data analysis.

## Technical data for ICP-Monitor

Name	ICP-Monitor HDM 29.2
Ordering Information	HDM 29.2
<b>Technical information</b>	
Measurement range	0 to +100 mmHg
Operating voltage	115-230 V ~, 50/60 Hz
Display indicator	mean ICP value systolic ICP diastolic ICP mains power indicator battery charge indicator
Battery operating time	up to 6 hours
Connectivity options	Digital output Patient monitor output
Re-calibration	✓
Weight (approx.)	1.5 kg



## Catheters reference list

		Length	External diameter			
			1.6 mm	2.0 mm (6 F)	2.7 mm (8 F)	3.3 mm (10 F)
EVD	<b>Standard-Polyurethane</b>					
	Ventricular Catheter	270 mm			EVD30.010.01	EVD30.030.01
	Ventricular Probe with Cranial Bolt	270 mm			EVD30.014.01	EVD30.034.01
	<b>Silver coated polyurethane</b>					
	Ventricular Catheter	270 mm		EVD30.020.02	EVD30.010.02	EVD30.030.02
Ventricular Probe with Cranial Bolt	270 mm			EVD30.014.02	EVD30.034.02	
ESD	Subdural Drainage Catheter	270 mm			EVD30.015.02	EVD30.035.02
ELD	Lumbar Drainage Catheter	800 mm	ELD33.010.02			

# External Drainage

## Silverline® Ventricular Drainage Catheter with Cranial bolt

The Ventricular Drainage Catheter is fixed to the calvaria with a cranial bolt. After drilling a hole and opening the dura, the catheter is inserted into the ventricle. The bolt is then slid over the catheter and screwed into the calvaria. The catheter is then secured with the bolt lock nut. All Silverline® Ventricular Drainage Catheters incorporate a silver additive intended to reduce the possibility that the surface of the device becomes microbial compromised.



### Technical data

Name	Silverline® Ventricular Probe with Cranial Bolt	
Ordering Information	EVD30.014.02	EVD30.034.02
<b>Technical information</b>		
Length	270 mm	270 mm
External diameter	8 F / 2.7 mm	10 F / 3.3 mm
Internal diameter	1.5 mm	1.9 mm
Diameter of drainage opening	1.2 mm	1.7 mm
Number of openings	16	16
Depth markings*	50–70 mm	50–70 mm
Material	silver coated, radiopaque polyurethane	
Duration of application	short-term, not more than 30 days	short-term, not more than 30 days

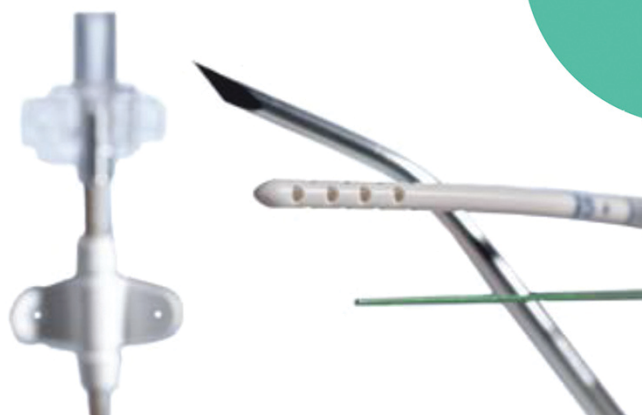
\* Two depth markings; the proximal mark denotes the orientation of the bolt. The 70-mm mark on the bolt corresponds to the actual brain depth.

The articles mentioned above are also available as standard catheters with the article numbers EVD30.014.01 and EVD30.034.01.

## Silverline® Ventricular Drainage Catheter

The Spiegelber Silverline® Ventricular Drainage Catheter is used for draining CSF to reduce elevated intracranial pressure. Indications may include sub arachnoid haemorrhage, traumatic brain injury and acute hydrocephalus. The Silverline® Ventricular Drainage Catheter is manufactured from radiopaque polyurethane. It comprises a closed round tip with labelled depth graduations. All Silverline® Ventricular Drainage Catheters incorporate a silver additive intended to reduce the possibility that the surface of the device becomes microbial compromised. It is supplied with a mandrin, a trocar, a Luer lock connector, a suture wing and a sealing cap.

Awarded the  
innovation prize



## Technical data

Name	Silverline® Ventricular Drainage Catheter		
Ordering Information	EVD30.020.02	EVD30.010.02	EVD30.030.02
<b>Technical information</b>			
Length	270 mm	270 mm	270 mm
External diameter	6 F / 2.0 mm	8 F / 2.7 mm	10 F / 3.3 mm
Internal diameter	1.0 mm	1.5 mm	1.9 mm
Diameter of drainage opening	0.9 mm	1.2 mm	1.7 mm
Number of openings	16	16	16
Depth markings	50–100 mm, 150 mm, 200 mm		
Material	silver coated, radiopaque polyurethane		
Duration of application	short-term, up to 30 days	short-term, up to 30 days	short-term, up to 30 days



# External Drainage

## External Silverline® Lumbar Drainage Catheter

The External Silverline® Lumbar Drainage Catheter is used to drain CSF during a therapy. External lumbar drainage is used to treat cerebrospinal fluid fistulas for the invasive diagnosis of normal pressure hydrocephalus (NPH). The Silverline® Lumbar Drainage Catheter incorporate a silver additive intended to reduce the possibility that the surface of the device becomes microbial compromised. It is supplied with a Tuohy needle, a Luer lock connector and a suture wing as well as other accessories.



## Technical data

Name	External Silverline® Lumbar Drainage Catheter
Ordering Information	ELD33.010.02
<b>Technical information</b>	
Length	800 mm
External diameter	1.6 mm
Internal diameter	0.8 mm
Diameter of drainage opening	0.7 mm
Number of openings	20
Depth markings	50–295 mm
Material	silver coated, radiopaque polyurethane
Duration of application	short-term, not more than 30 days

# External Drainage

## Silverline® Subdural Drainage Catheter

The Silverline® Subdural Drainage Catheter is specifically indicated for drainage following evacuation of chronic subdural haematomas (CSH) and includes a 6 cm long perforation zone near the tip. It is supplied with a mandrin, a trocar, a Luer lock connector and a suture wing.

### Technical data

Name	Silverline® Subdural Drainage Catheter	
Ordering Information	EVD30.015.02	EVD30.035.02
<b>Technical information</b>		
Length	270 mm	270 mm
External diameter	8 F / 2.7 mm	10 F / 3.3 mm
Internal diameter	1.5 mm	1.9 mm
Diameter of drainage opening	1.2 mm	1.7 mm
Number of openings	48	48
Depth markings	70–100 mm, 150 mm, 200 mm	70–100 mm, 150 mm, 200 mm
Material	silver coated, radiopaque polyurethane	
Duration of application	short-term, not more than 30 days	short-term, not more than 30 days

# External Drainage

## Ventricular Drainage Catheter

The Spiegelber Silverline® Ventricular Drainage Catheter is used for draining CSF to reduce elevated intracranial pressure – for example in the case of subarachnoid haemorrhage, traumatic brain injury and acute hydrocephalus. The Spiegelberg Ventricular Drainage Catheter is manufactured from radiopaque polyurethane. It features a closed round tip and the tube is graduated. It is supplied with a mandrin, a trocar, a Luer lock connector and a suture wing.



## Technical data

Name	Ventricular Drainage Catheter	
Ordering Information	EVD30.010.01	EVD30.030.01
<b>Technical information</b>		
Length	270 mm	270 mm
External diameter	8 F / 2.7 mm	10 F / 3.3 mm
Internal diameter	1.5 mm	1.9 mm
Diameter of drainage opening	1.2 mm	1.7 mm
Number of openings	16	16
Depth markings	50–100 mm, 150 mm, 200 mm	50–100 mm, 150 mm, 200 mm
Material	radiopaque polyurethane	radiopaque polyurethane
Duration of application	short-term, not more than 30 days	short-term, not more than 30 days




## **To measure intracranial pressure**

All Spiegelberg Ventricular Probes feature 2 distinct functionalities in one single product: measurement of ICP and drainage function. Since the technology is integrated in the monitor and not in the probe, ICP-Probes are particularly robust. All ICP-Probes can also be used directly, as they do not require a null adjustment. Spiegelberg ICP-Probes are available as tunnel or bolt versions and are MR-compatible for 1.5 and 3 Tesla under certain conditions.

## **Patented Silverline® technology**

All Spiegelberg Silverline® probes incorporate a silver additive intended to reduce the possibility that the surface of the device becomes microbial compromised. This invention was awarded the innovation prize by the senate of the Free and Hanseatic City of Hamburg.



**Our probes  
are very robust  
and cost efficient**

## Parenchymal Probe with Cranial Bolt (Probe 3PS)

The Spiegelberg Parenchymal Probe with Cranial Bolt measures the parenchymal intracranial pressure. The probe is fixed in the parenchyma with a bolt that is screwed into the calvaria.



### Technical data

Name	Probe 3PS
Ordering Information	SND13.1.63/FV535P
<b>Technical information</b>	
External diameter	4 F / 1.3 mm
Implantable length	40 mm
Overall probe length	1500 mm
Air-pouch width	/
Air-pouch length	/
Fill volume	< 0.15 ml
Material	Polyurethane
Duration of application	short-term, not more than 30 days



### MR Safety Information

Non-clinical tests have shown that Spiegelberg probes at 1.5 T and 3 T are conditionally MR-compatible (MR Conditional). Patients fitted with these products can be safely scanned in an MR system as long as the MR safety instructions included with the product are observed.

## Silverline® Ventricular Probe with Cranial Bolt

The Spiegelberg Silverline® Ventricular Probe incorporating a cranial bolt is fixed to the calvaria with the cranial bolt. After drilling a hole and opening the dura, the probe is inserted into the ventricle with the cranial bolt drawn back. The bolt is then slid over the probe and screwed into the calvaria. The Silverline® Ventricular Probe can then be secured with the bolt lock nut. The drainage tube is connected to the provided Luer lock connector and attached to a drainage assembly. The air tube is connected to the Spiegelberg ICP-Monitor using the extension.



### Technical data

Name	Probe 14S
Ordering Information	SND13.1.14S
<b>Technical information</b>	
External diameter	8 F / 2.7 mm
Internal diameter	1.5 mm
Length of drainage tube	270 mm
Implantable length	70 mm
Overall probe length	1500 mm
Diameter of drainage opening	1.3 mm
Number of openings	12
Depth markings	50-60-70 mm
Fill volume	< 0.15 ml
Material	silver coated, radiopaque polyurethane
Duration of application	short-term, not more than 30 days



## Ventricular Probe

The Spiegelberg Ventricular Probe measures the intraventricular pressure using an air-pouch mounted on the distal end of the dual lumen probe. One lumen transmits pressure to the ICP-Monitor, and the other is used for draining cerebrospinal fluid (CSF).



## Technical data

Name	Probe 3	Probe 3XL
Ordering Information	SND13.1.13/FV532P	SND13.1.13XL/FV533P
<b>Technical information</b>		
External diameter	7 F / 2.3 mm	9 F / 3.0 mm
Internal diameter	1.0 mm	1.6 mm
Length of drainage tube	270 mm	270 mm
Implantable length	130 mm	130 mm
Overall probe length	1500 mm	1500 mm
Diameter of drainage opening	1.0 mm	1.6 mm
Number of openings	4	4
Depth markings	50–100 mm	50–100 mm
Fill volume	< 0.15 ml	< 0.15 ml
Material	Polyurethane	Polyurethane
Duration of application	short-term, not more than 30 days	short-term, not more than 30 days

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