PAJUNK®

The New SPROTTE® Generation

Dura puncture in minimum time

Spinal anaesthesia

The New SPROTTE® Generation

atraumatic, ergonomic, dynamic

The success story of the atraumatic SPROTTE® cannula

The seventies

After almost 100 years, spinal anaesthesia reached a low point in acceptance.

➡ In view of the enormous progress in the field of anaesthetic techniques, the frequent after-effects of spinal anaesthesia that are difficult to influence are practically no longer justified.

1979

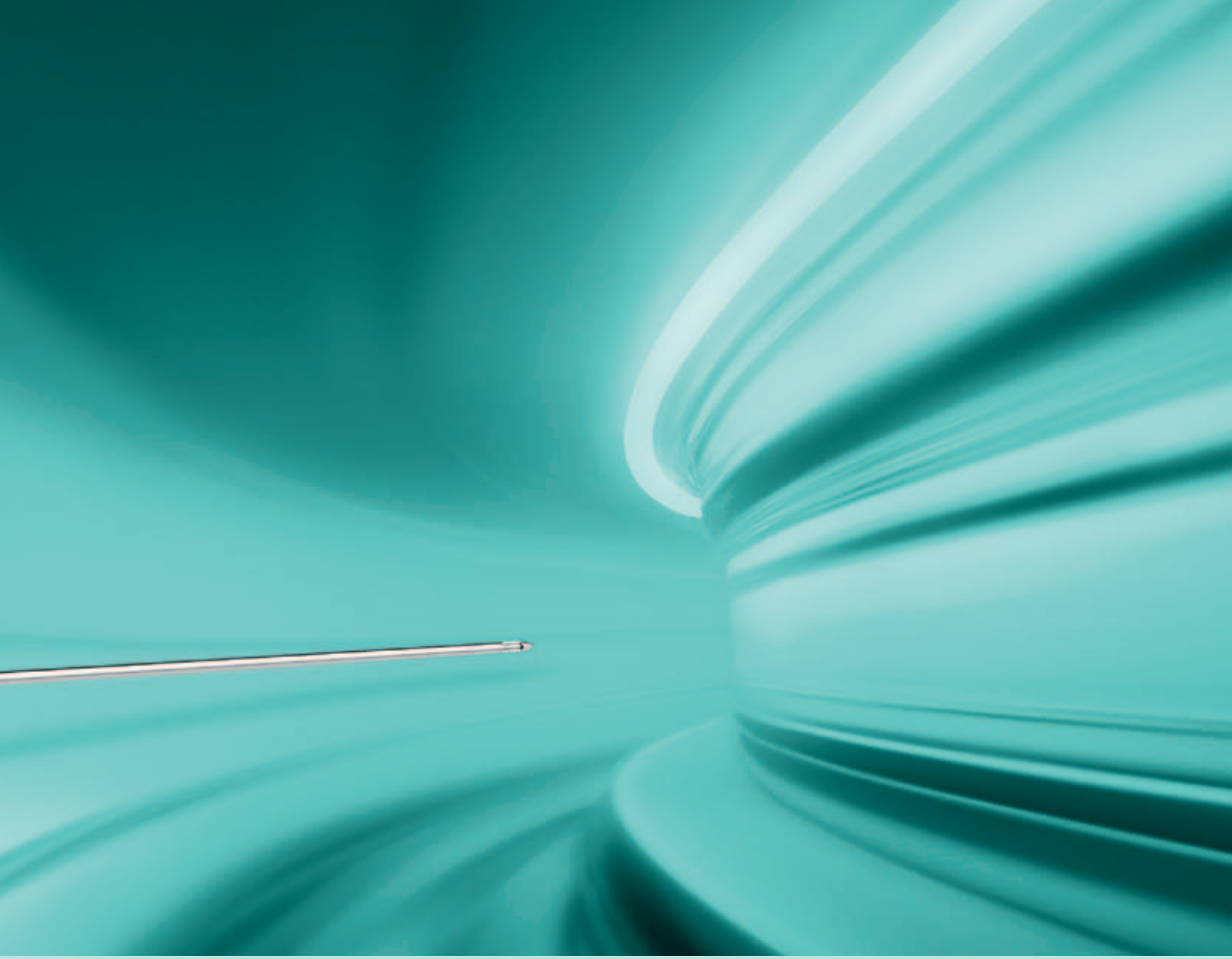
Market launch of the atraumatic SPROTTE® cannula – a joint development from Prof. Sprotte and PAJUNK®. This cannula combines clinical experience with innovative medical technology.

➡ It is the first **atraumatic cannula** for dural puncture. The re-establishment of spinal anaesthesia as a modern and fully accepted method of anaesthesia is based on a multitude of studies which have been conducted using SPROTTE® cannulas.

1991

The first controlled study in the application area of diagnostic lumbar puncture was carried out by Jäger et al. It verifies that the advantage of an atraumatic puncture is much more impressive for larger cannula diameters.

➡ **The rate of post-dural puncture headache drops by a factor of 10** when compared with conventional cannulas. Other symptoms of the post-dural puncture syndrome no longer appear for the atraumatic puncture in this study.



2004

Redesign of the cannula hub with a reduced interior and optionally **integrated magnifying glass.**

➡ Even the smallest amounts of cerebrospinal fluid can be clearly detected and allow for an immediate response.

2005

The American Academy for Neurology (AAN) has ascertained that the advantages of the atraumatic puncture technique of the subarachnoid space, which have previously been scientifically proven for spinal anaesthesia, now also are evident for diagnostic lumbar puncture. **(Evidence class 1, recommendation level A)**

➡ These findings from the AAN are based on the assessment of published studies where the atraumatic technique was performed exclusively with original SPROTTE® cannulas.

2013

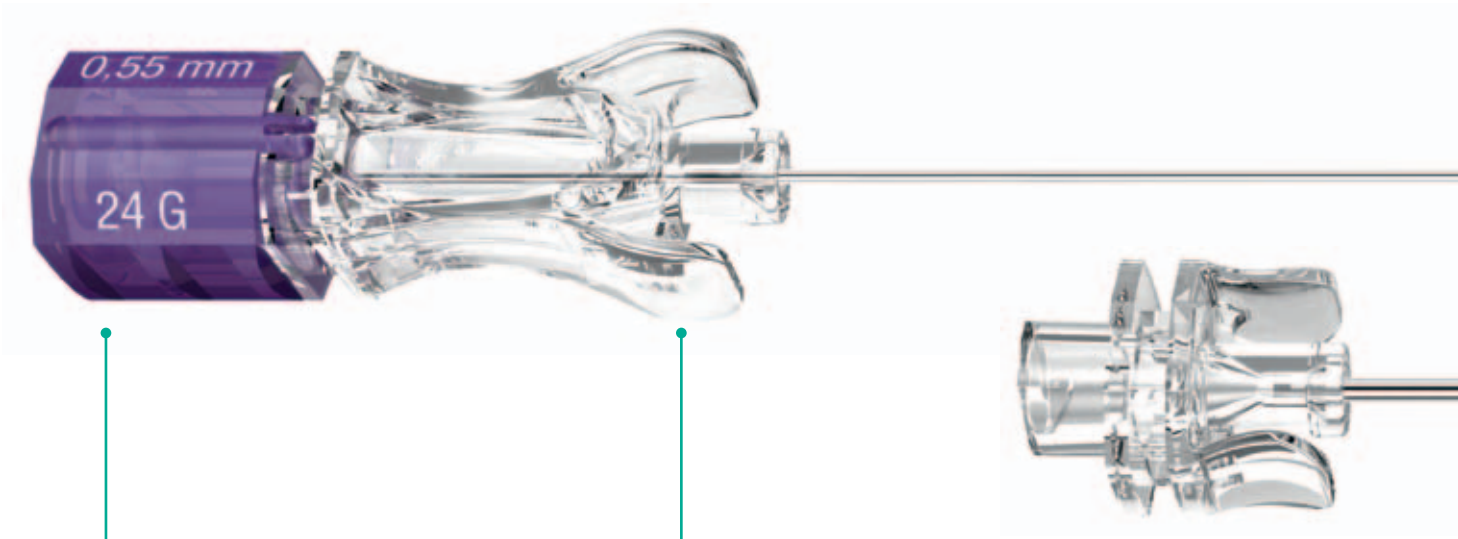
The new SPROTTE® cannula generation combines a modern design with **outstanding ergonomic properties** and **achieves minimum times for the flow of cerebrospinal fluid.**

➡ The response times are reduced to a minimum.

The New SPROTTE® Generation

Innovation with a modern design

Since its introduction, the SPROTTE® cannula stands for outstanding atraumatic dural puncture thanks to the unique tip geometry. The new SPROTTE® generation continues this success story and is convincing with an innovative design of the cannula hub which meets the highest ergonomic requirements, thus facilitating dural puncture. Due to a sophisticated further development of the magnifying effect, the new SPROTTE® cannula allows for an even faster detection of the cerebrospinal fluid.

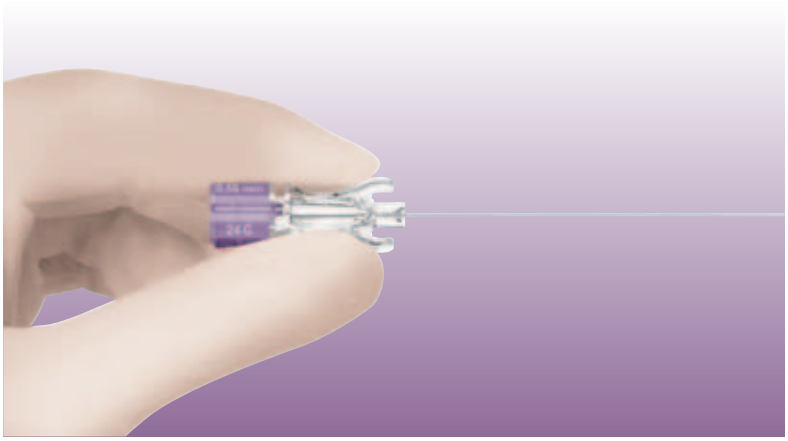


Colour coded hub with size specification
A wide range of cannulas with different diameters and lengths – including special designs for paediatrics and cannulas for obese patients – allows for exact matching to individual requirements.

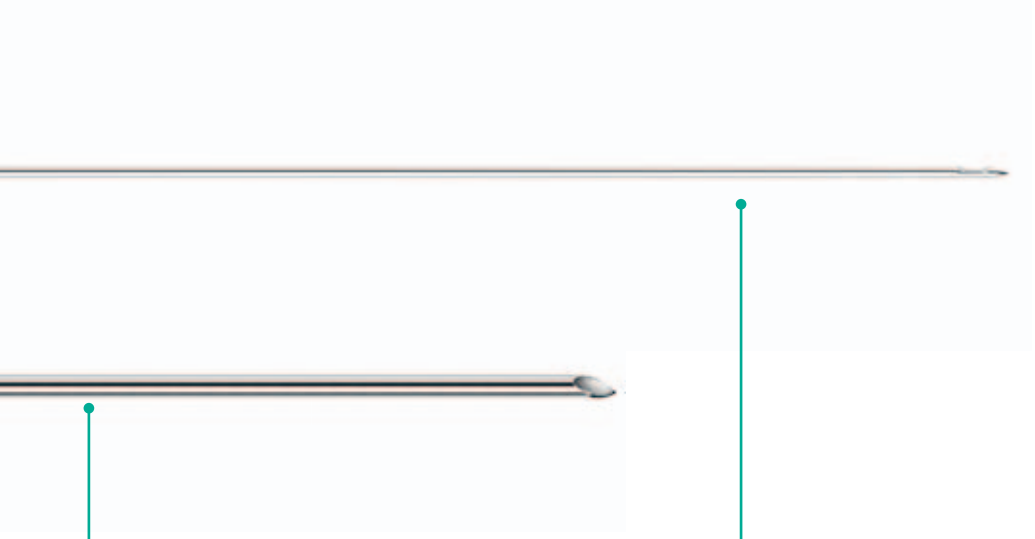
22 G = 0.70 mm ■ 25 G = 0.50 mm ■

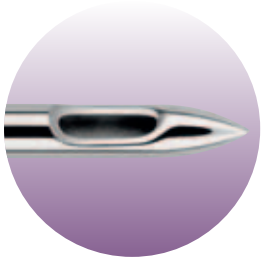
24 G = 0.55 mm ■ 27 G = 0.40 mm ■

Cannula hub with integrated magnifying glass
The newly developed hub of SPROTTE® cannulas generally has an integrated magnifying glass. The improved magnifying effect permits for a faster detection of the cerebrospinal fluid.



Ergonomic hub
The new design of the cannula hub meets the highest ergonomic requirements.

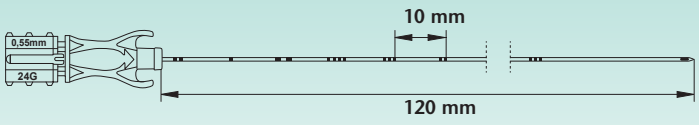




The ogive-shaped tip geometry provides the cannula with its atraumatic property and a tactile perception when penetrating tissue with different densities.

Perfectly fitting introducer

Depending on diameter and length there is a specific introducer available for every cannula size. The inner contour of the introducer hub is designed so that the atraumatic tip of the SPROTTE® cannula is not damaged during introduction. In addition the useable working length of the spinal cannula is only minimally reduced due to the new design of the introducer hub.



The cannula is graduated in 1 cm steps from a length of 120 mm to determine the puncture depth

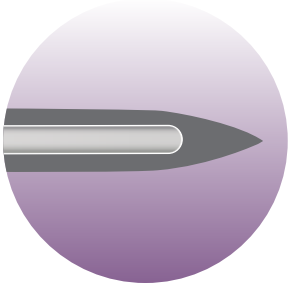
The original SPROTTE® cannula

A guarantee for atraumatic puncture

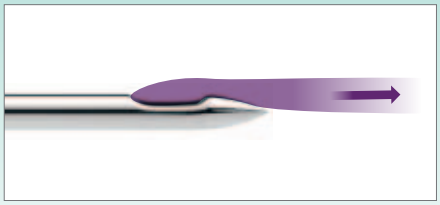
The secret of success lies in the tip geometry and basic architecture of the SPROTTE® cannula that is unique even today. In this way, the original offers a higher level of safety and reliability for patients and users by comparison.

Nothing has been left to chance with regard to the quality of the cannula. The exclusive use of first class stainless steel, the perfect fit of the stylet as well as the special processing of the tip provide SPROTTE® cannulas with a particularly high level of stability and resistance to breaking even in case of bone contact.

The stylet has been manufactured with such a precise fit that it perfectly closes the lateral eye.

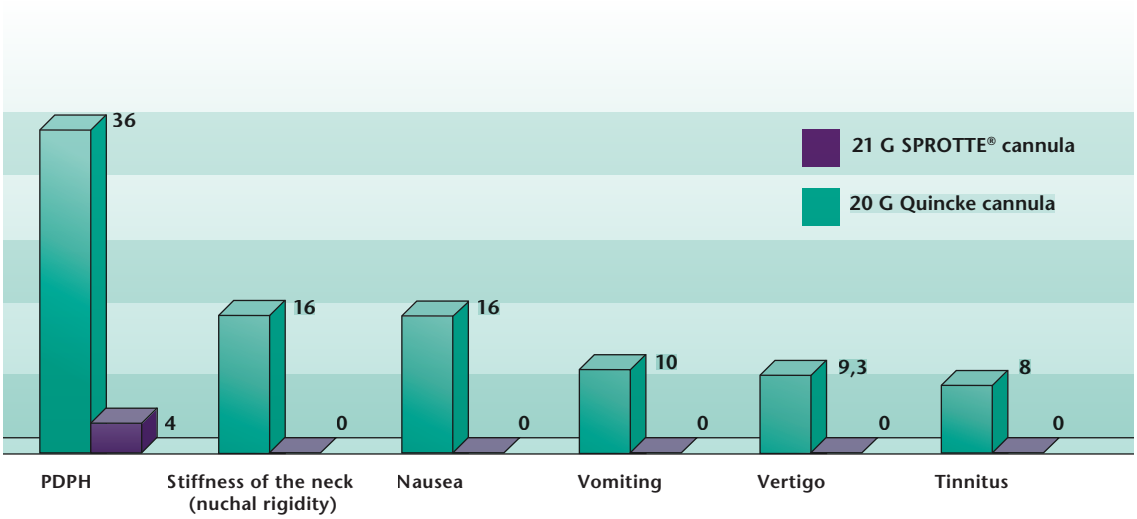


The polished and rounded end of the stylet prevents any abrasion at the inner lumen of the cannula.



Lateral eye with rounded edge
The lateral opening of the SPROTTE® cannula is completely free from burrs and has atraumatically rounded edges.
➡ This quality feature gives rise to perfect gliding properties and minimises the spreading of tissue particles in the spinal canal.

Sophisticated dimensioning
The design of the size, width and layout of the lateral eye makes the anaesthetic flow over the cannula tip in a soft stream.
➡ This prevents nerve injuries that can arise when using cannulas with a small opening as a result of the anaesthetic escaping at high pressure.



Evidence shows that post spinal headaches appear less frequent when the SPROTTE® cannula is used. (Results of the first controlled study – Jäger et al. 1991 Akt. Neurol. 18: 61–64)

Minimisation of side effects

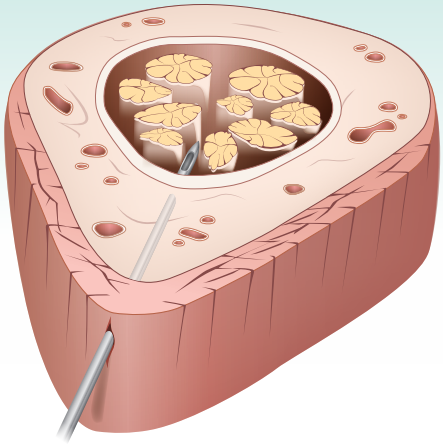
It has been proven that the use of atraumatic SPROTTE® cannulas reduces post-dural puncture headaches and prevents stiffness of the neck, nausea and vomiting as far as possible.

The first controlled study by Jäger et al. 1991, Akt. Neurol.18: 61–64 showed in 1991 that post-dural puncture headaches are a clearly rarer occurrence when using the SPROTTE® cannula.
Further studies that verify this: Evidence class I, recommendation type A (Neurology 2000; 55…909–914); this applies to all diameters of atraumatic cannulas in use from gauge 20 (Strupp et al Neurology 2001; 57:2310–2312) to gauge 27 (Flaatten et al, Acta Anaesthesiol Scand 2000; 44:643–644).

Maximum profitability

A current study by Christie E. Tung, Yuen T. So and Maarten G. Lansberg compares the costs of the atraumatic SPROTTE® cannula with the cutting Quincke cannula: (Neurology 2012; 78; 109; May 24, 2012).

This study considers the material and treatment costs of possible post-dural puncture headaches after lumbar puncture and concludes that the exclusive use of atraumatic cannulas instead of cutting Quincke cannulas by neurologists would reduce annual costs for the US health system by $10.4 million.



Ogive-shaped tip geometry

The closed tip of the cannula has the shape of an ogive. It displaces the tissue during puncture causing only a minimum of injuries.

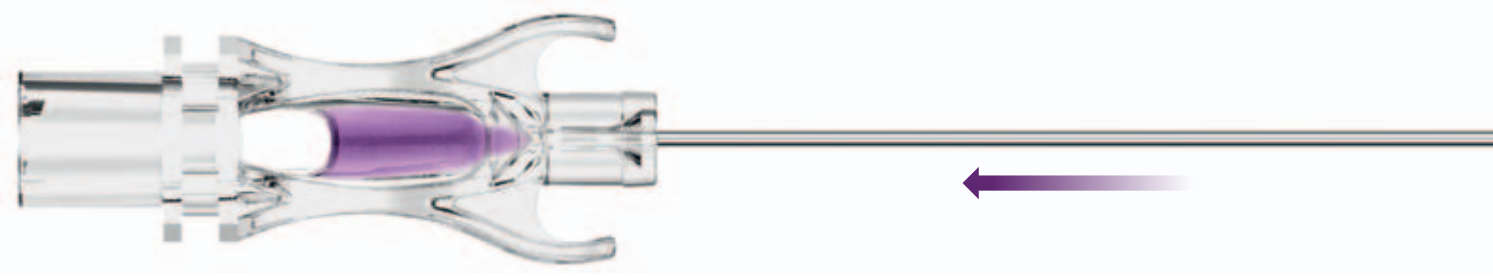
➡ **After removing the cannula, the multi-layered texture of the dura consisting of collagen and elastic fibres closes again.**

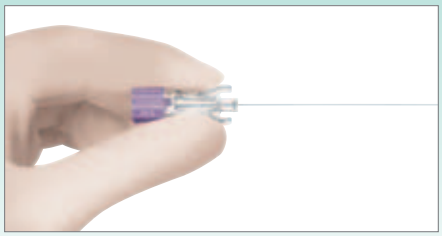
The new cannula design

Dura puncture in minimum time

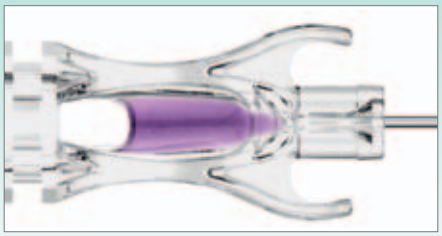
Time is a decisive criterion in spinal anaesthesia. Firstly, quick detection of the cerebrospinal fluid and thus the correct position of the cannula increases the level of safety for the user and prevents incorrect conclusions. Secondly, this reduces the time requirement and costs for the actual intervention.

This is exactly where the new generation of the atraumatic SPROTTE® cannula comes in. Compared with conventional cannulas for dural puncture, the new SPROTTE® generation achieves a significantly faster flow of cerebrospinal fluid. The increased flow rate is achieved by the polished and thus smoother surface of the inner lumen as well as the size and position of the lateral eye. With the aid of the integrated magnifying glass, even the smallest quantities of cerebrospinal fluid are visible quickly.





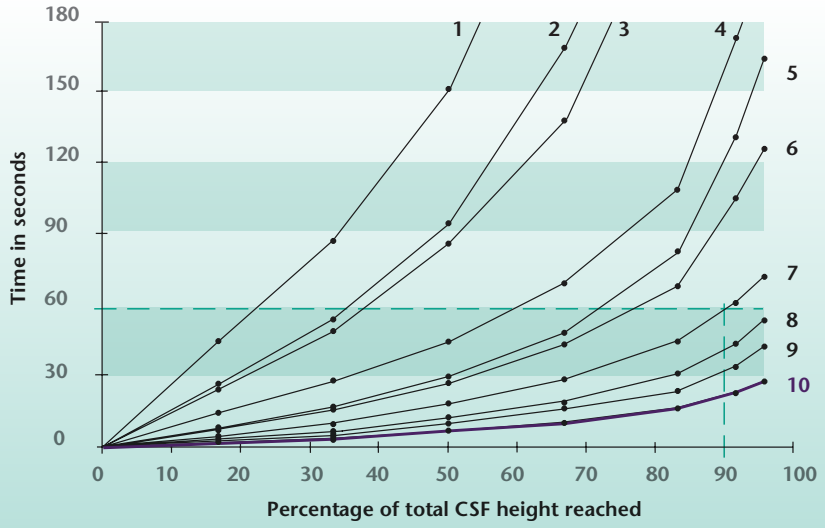
Ergonomic cannula hub
The newly designed cannula hub has perfect ergonomic features. The special form of both “wings” enables slip-free positioning of the fingertips.
➡ **The cannula has a good grip. Rotational movements can be easily conducted and puncture can be performed sensitively.**



Magnifying effect
The integrated magnifying glass is the central element of the new SPROTTE® cannula hub.
➡ **Even the smallest quantities of cerebrospinal fluid can be clearly detected in good time thanks to this viewing chamber.**

The Carson study

A study of the CSF flow velocity of the PAJUNK® SPROTTE® cannula by comparison was already presented by Carson in 1996. Here the spinal cannulas were introduced in a model spinal canal and attached to a spinal manometer. The time in which the defined cerebrospinal pressure could be displayed on the spinal manometer was then measured. The best result was provided by the 20 G SPROTTE® cannula that, for a normal cerebrospinal fluid pressure, reached the correct measurement result in less than 30 seconds.
A current comparison of the new SPROTTE® cannula 24 G x 90 mm with the previous generation of the same size showed that **the cerebrospinal flow rate could be further increased by around 35 % thanks to the new design.**



1 SPINOCAN 25 G QUINCKE
2 SPROTTE® 24 G ATRAUMATIC
3 VYGON 25 G WHITACRE
4 SPINOCAN 22 G QUINCKE
5 BD 22 G QUINCKE
6 BD 22 G WHITACRE
7 SPROTTE® 22 G ATRAUMATIC
8 VYGON 22 G WHITACRE
9 SPINOCAN 20 G QUINCKE
10 SPROTTE® 20 G ATRAUMATIC

Pressure transduction of a simulated cerebrospinal fluid pressure of 24 cm passing through cannula of different manufacturers. According to Carson D.: Choosing the best cannula for diagnostic lumbar puncture Neurology 1996; 47:33–37

Free flow of cerebrospinal fluid

The positioning and size of the lateral eye in the cannula tip guarantees an unhindered flow of cerebrospinal fluid even when arachnoidea partially blocks the opening.
➡ **This provides the user with the security that the correct position of the cannula tip is also detected.**

Dural puncture in minimum time
The faster flow of cerebrospinal fluid as well as optimized visibility under the magnifying glass ensure minimum times for dural puncture.

SPROTTE®
Studies from 1987 to 2012

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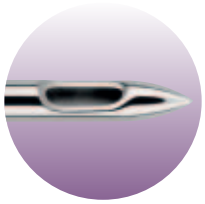
Selection of quality features

The wide variety of the product range

The well-balanced range of products permits the user to select the respectively suitable cannula length and cannula diameter for every conceivable indication.



SPROTTE® 2.G

Size	without Introducer Item no.	with Introducer Item no.	PU
27 G x 123 mm*	231251-27A		10
27 G x 120 mm*		151251-27A	10
27 G x 103 mm		141251-27A	25
27 G x 90 mm		121251-27A	25
27 G x 70 mm		121251-27B	25
25 G x 150 mm*		061251-29A	10
25 G x 120 mm*	031251-29A	051251-29A	10
25 G x 103 mm		041251-29A	25
25 G x 90 mm	501251-29A	021251-29A	25
25 G x 70 mm		021251-29B	25
24 G x 120 mm*	031251-30A	041251-30A	10
24 G x 103 mm	521251-30A	021251-30A	25
24 G x 90 mm	001251-30A	121251-30A	25

* with graduation

Introducer for SPROTTE® 2.G

Size	Item no.	Cannula size	PU
0.70 x 30 mm	071251-30L	27 G	25
0.70 x 40 mm	071251-30M	27 G	25
0.80 x 30 mm	021251-30L	24 G and 25 G	25
0.80 x 40 mm	021251-30M	24 G and 25 G	25

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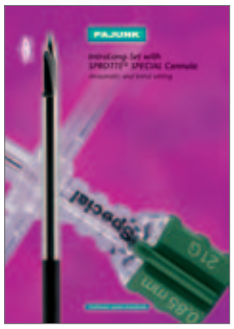

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