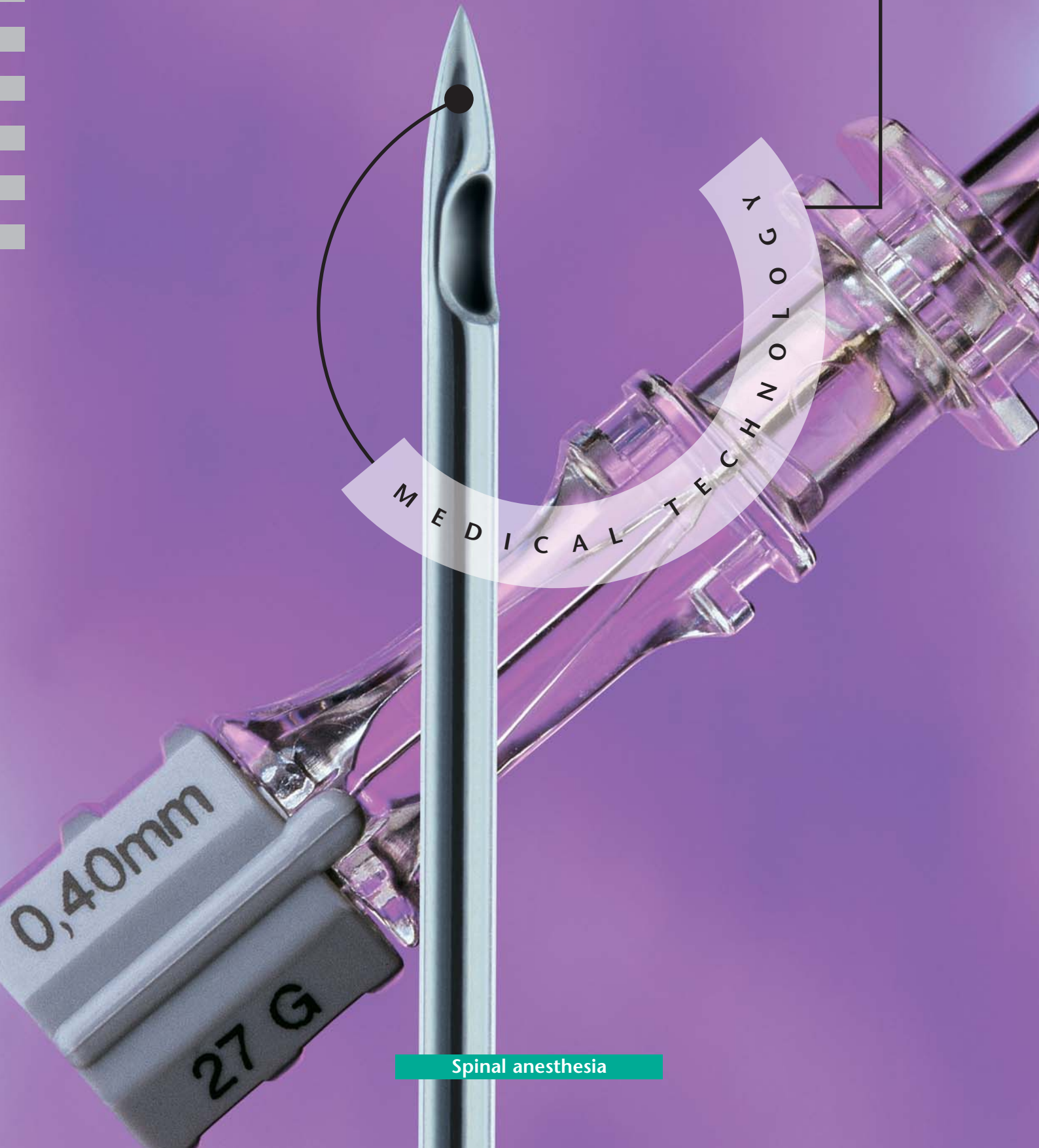


**PAJUNK®**

*Sprotte® cannula*

*The new standard*



MEDICAL TECHNOLOGY

Spinal anesthesia

Up to date:

## Progress in spinal anesthesia

In the course of the last century, materials, diameters and tip geometries of spinal cannulae have been revised and changed again and again. The numerous secondary effects of the sharply ground Quincke cannula in spinal anesthesia led to the development of the Whitacre cannula in 1951.

However, the pencil-point tip of this cannula proved to be too blunt, and the geometric design of the circular cone did not correspond to the physical optimum for a dura puncture. The lateral circular opening was also too small for safe identification of the liquor space (cerebrospinal fluid space).

The Sprotte cannula, developed in 1979 by Professor Sprotte in collaboration with Pajunk, takes these points of criticism into account. The closed cannula tip of the Sprotte cannula has the shape of an ogive. It displaces the tissue of the dura mater without injuring it. The multiple layered texture of the dura closes completely again, after the cannula has been removed. The optimized lateral opening in the near of the cannula tip ensures the unhindered liquor reflux, and it safeguards the explicit and fast identification of the subarachnoid space. In addition, the anesthetic can be distributed evenly over the cannula tip in a gentle stream, sparing the fine nerve structures.

### The development of the spinal cannulae

for example: tip geometry



Quincke type  
1890



Whitacre  
1951



Levy  
1957



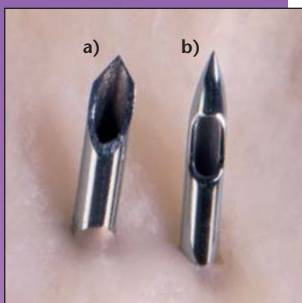
Sprotte  
1979

The atraumatic puncture technique with the Sprotte cannula gives spinal anesthesia a completely new meaning.

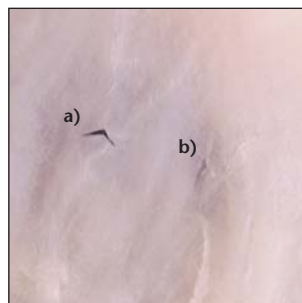
### Sprotte® cannula



Stylet cannula introducer



A Quincke- (a) and a Sprotte cannula (b) penetrate the multi-layered texture of the spinal dura.



The incised wound continuing to exist after application of the Quincke cannula (a) may be seen by applying a push-pull movement upon the dura tissue.

Taken quite seriously:

# Perfection up to the smallest detail

Whoever values the strict requirements for purity in pharmaceutical preparations should also demand purity for the cannulae used. Cleanness is a decisive characteristic for quality and safety.

### Our demands are high

The Sprotte cannula is cleaned extravagantly in numerous production steps. For optimal cleanness, and thus more safety for the patient. After cleaning, the Sprotte cannulae run through a special drying procedure.

### Optimized: material and processing

The outer surface, the tip of the stylet, and the lateral eye of the Sprotte cannula are extensively polished. Through this, the steel becomes extremely smooth, thus minimizing the detachment of reactive metal particles and their spreading into the liquor.

Original Sprotte cannulae have a low inner surface roughness of the inside surface of the cannula.

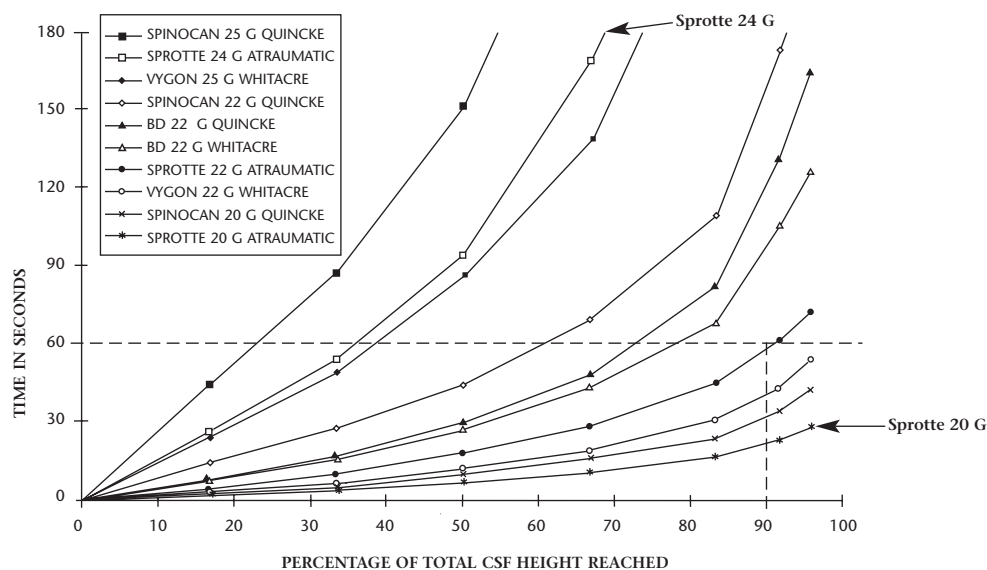
The lateral opening of the Sprotte cannula is totally free of burrs, and it has atraumatic rounded edges. Any danger of injuring the dura is therefore principally excluded.

## Processing and design results in a better liquor flow

Processing and design of the original Sprotte cannula also have a decisive effect for the free flow of the liquor. The low inner surface roughness of the Sprotte cannula is one of the factors that have a positive effect. A further advantage is

the lateral opening in the cannula, proximately behind the cannula tip. It ensures unhindered liquor flow, even if the opening is partially blocked by the arachnoidea.

## The Carson study



Pressure equalization / decompression of a simulated liquor pressure of 24 cm through cannulae of various types and of different manufacturers.

According to Carson D: Choosing the best needle for diagnostic lumbar puncture; Neurology 1996; 47:33-37

Succeeding by replacing:

## New impulses from research

The knowledge gained from the cooperation of Professor Sprotte and Pajunk is immediately utilized in the further development of our medical-technological instruments. The original Sprotte cannula therefore always corresponds to the most current state of the art!

Time is a decisive criterion in spinal anesthesia. The plastic connector of the advanced-develop-

ment Sprotte cannula has a reduced interior space. It is thus filled quicker, making the recognition of liquor faster.

By using the Sprotte cannula, the period of time elapsing between the puncture of the spinal space and the injection of the anesthetic can be substantially reduced.



Cannula with an integrated magnifying glass

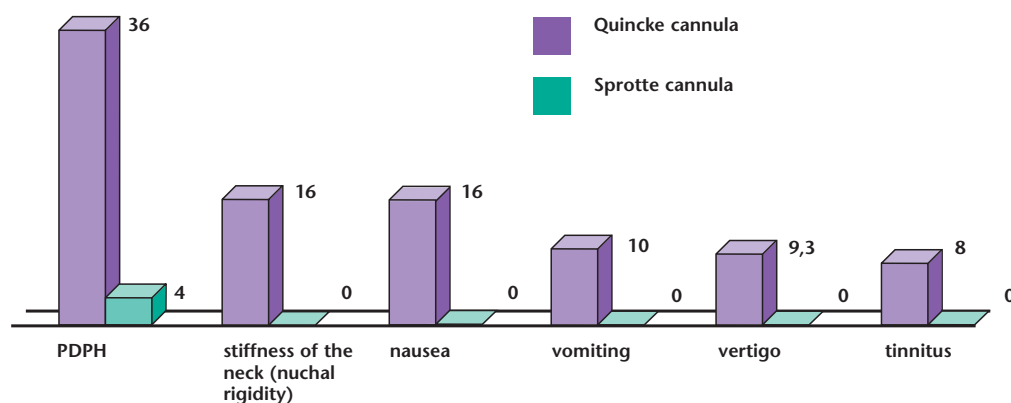
Unique, and only Pajunk has it: the model with a magnifying effect. Even the smallest amounts of liquor are clearly identified through a viewing-chamber in the cannula connector. For more safety, and it's a real time-saver!

## New insights from practical work

The reduction of post-spinal headaches by the use of atraumatic cannulae has been proven: Evidence class I, recommendation type A (Neurology 2000; 55:909-914) this applies to all diameters of atraumatic cannulae in use, from 20 gauge (Strupp et al, Neurology 2001; 57: 2310-2312) up to 27 gauge (Flaatten et al, Acta Anaesthesiol Scand 2000; 44: 643 – 644).

The recommendation to use atraumatic cannulae is also based on economic grounds: every prevented headache reduces the medical costs by a manifold of the price difference to conventional cannulae.

Not only headaches, but also stiffness of the neck (nuchal rigidity), nausea, and vomiting can be effectively avoided by using atraumatic cannulae, see the results of the first controlled study by Jäger et al 1991 Akt. Neurol. 18: 61-64.

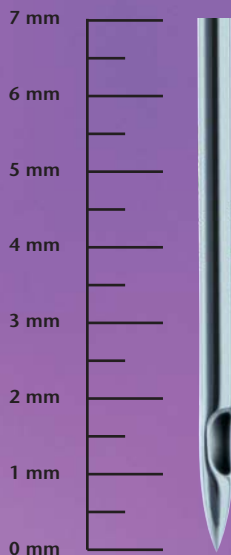
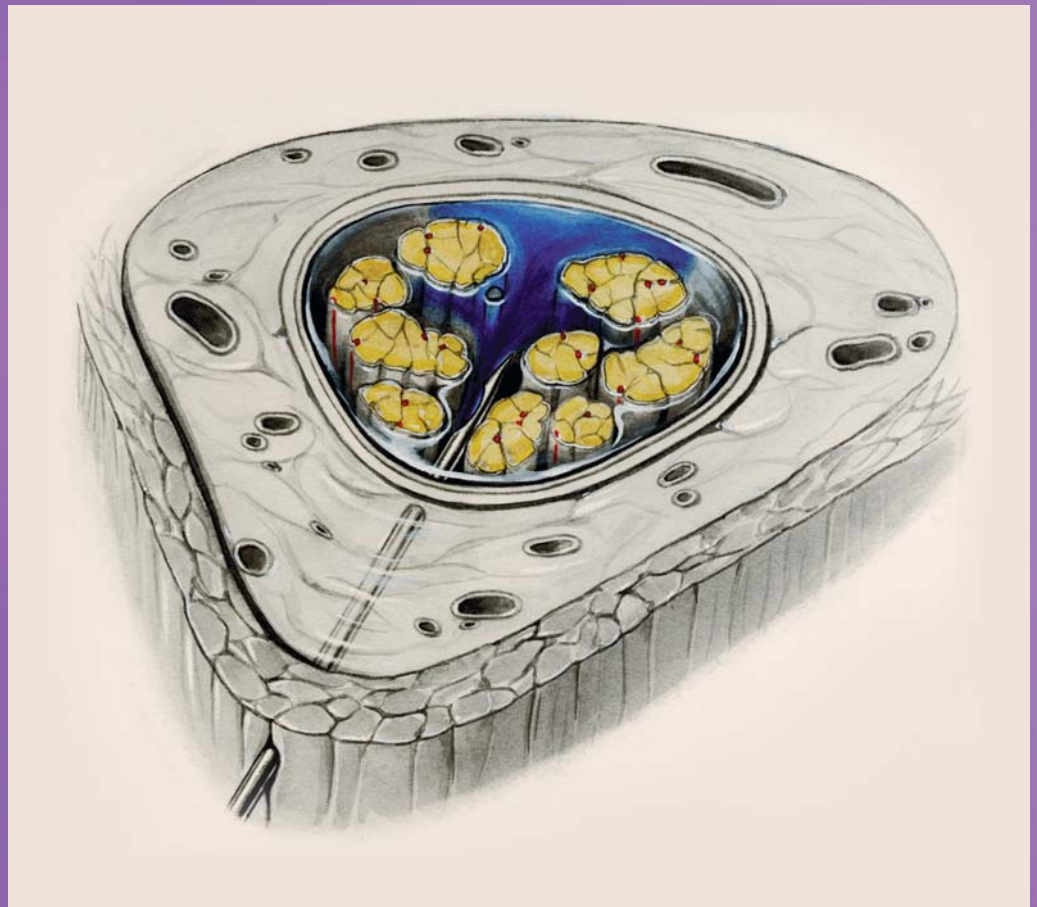


Post spinal headaches are significantly rarer when the Sprotte cannula is used.

*Meticulous care and precision:*

## *Quality, as it is defined!*

The optimum for every application: A broad variety of cannulae with different diameters and lengths makes the correct adaptation to individual requirements possible. Special designs for pediatrics, and Sprotte cannulae for adults with overweight round off the assortment.



A milestone in the history of regional anesthesia: with the introduction of the original Sprotte cannula of Pajunk in the year 1979, spinal anesthesia has again become the most frequently used regional anesthesia procedure. Among other things, this large success is based on the unique design of the tip, and also on the lateral eye of the cannula.

The ogive shaped cannula tip penetrates the dura mater without injuring it. Among other things, the original Sprotte cannula reduces post spinal headache to an absolute minimum.

And it additionally makes the application on outpatients possible. When using a Special Sprotte cannula, the advantages of the atraumatic puncture can also be utilized for continuous anesthesia techniques.

The Sprotte cannula has continually been optimized, thanks to the intensive collaboration between Pajunk and professor Sprotte. The ORIGINAL makes spinal anesthesia a particularly gentle and safe procedure.

With a distinct lead in development. And a unique understanding of QUALITY!

Quality characteristic: diversity

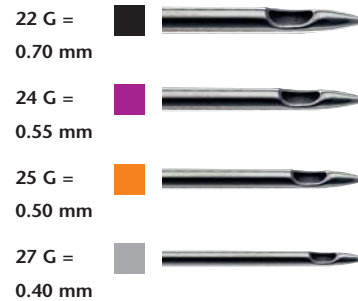
# The assortment in its whole variety

## Standard Sprotte® cannulae with magnifying effect



Without Introducer      With Introducer

Size	Order no.	Order no.	ppP
29 G x 90 mm		501151-28A	25
27 G x 123 mm	231151-27A		10
27 G x 120 mm		151151-27A	10
27 G x 103 mm		141151-27A	25
27 G x 90 mm		121151-27A	25
27 G x 70 mm		121151-27B	25
27 G x 35 mm	111151-27A	101151-27A	
27 G x 25 mm	121151-27D		25
25 G x 123 mm	251151-29A		10
25 G x 120 mm		171151-29A	10
25 G x 103 mm		161151-29A	25
25 G x 90 mm	521151-29A	511151-29A	25



## Standard Sprotte® cannulae



Without Introducer      With Introducer

Size	Order no.	Order no.	ppP
25 G x 123 mm	151151-29A		10
25 G x 120 mm	031151-29A	051151-29A	10
25 G x 103 mm		041151-29A	25
25 G x 90 mm	501151-29A	021151-29A	25
25 G x 70 mm		021151-29B	25
25 G x 35 mm	001151-29E		25
24 G x 150 mm	141151-30A	131151-30A	10
24 G x 120 mm	031151-30A	041151-30A	10
24 G x 103 mm	521151-30A	021151-30A	25
24 G x 90 mm	001151-30A	121151-30A	25
24 G x 70 mm	001151-30B	021151-30B	25
24 G x 35 mm	001151-30E		25
24 G x 25 mm	001151-30D		25
22 G x 150 mm	041151-30C	141151-30C	10
22 G x 120 mm	031151-30C	131151-30C	10
22 G x 103 mm	521151-30C	221151-30C	25
22 G x 90 mm	001151-30C	021151-30C	25
22 G x 70 mm	051151-30C	051151-30B	25



### Introducer

For Standard Sprotte® cannulae

Size	Order no.	Fitting for	ppP
0,70 x 30 mm	071151-30L	27 G u. 29 G	25
0,70 x 40 mm	071151-30M	27 G u. 29 G	25
0,80 x 30 mm	021151-30L	27 G u. 29 G	25
0,80 x 40 mm	021151-30M	24 G u. 25 G	25
1,00 x 30 mm	001151-30L	22 G	25
1,00 x 40 mm	001151-30M	22 G	25

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