

PAJUNK®

SPROTTE® Cannula

The original – In a class of its own



Spinal anaesthesia

30 years SPROTTE® cannula

The Success Story in Spinal Anaesthesia

The partnership between Prof. Sprotte and PAJUNK® began in 1979 with the joint development of the "atraumatic spinal cannula". This combination of clinical experience and innovative medical technology was the catalyst from which spinal anaesthesia established itself as an indispensable practice in the spectrum of modern anaesthesia methods. By the end of the seventies, spinal anaesthesia was hardly of any importance anymore in the range of options open to the anaesthetist.


The limitations which arose from a range of frequent and rare complications were too great: intense headache, nausea, vomiting, low-frequency hearing loss, abducens nerve paresis and subdural haematomas. Spinal anaesthesia could no longer maintain its standing in direct competition with more mature and sophisticated narcosis methods which were additionally readily available.


Often copied – but never matched


The Original – In a Class of its Own

The secret of this success is in the unique tip geometry and basic design of the SPROTTE® cannula which has been unequalled to this day. In comparison with other cannulas the original

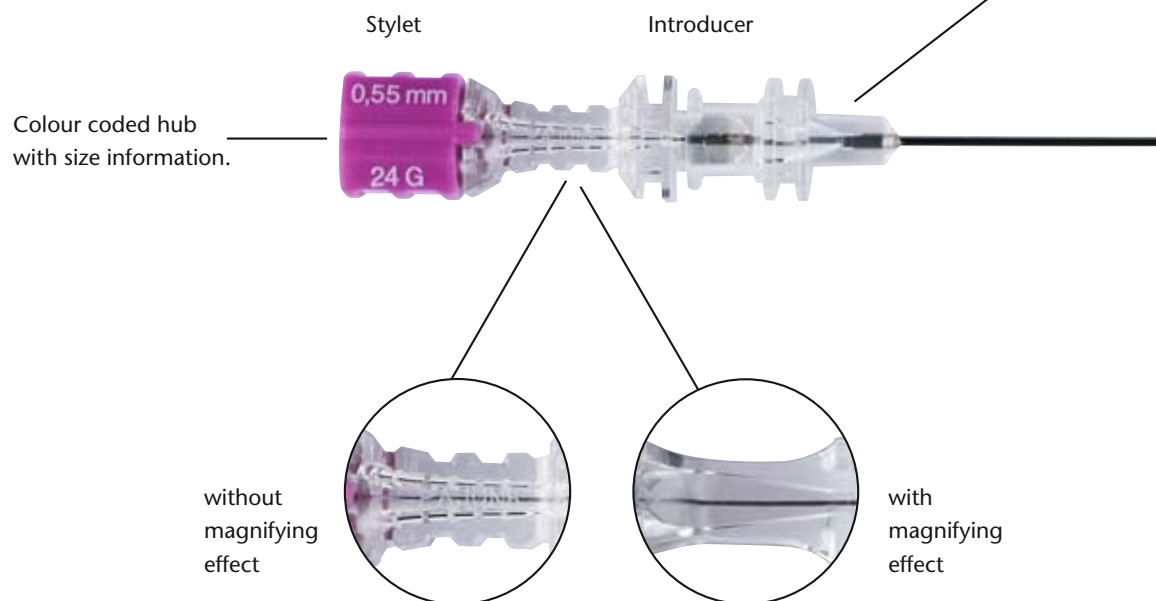
provides both patients and users alike with a considerably greater range of functionality, safety and reliability.

22 G = 0.70 mm 

24 G = 0.55 mm 

25 G = 0.50 mm 

27 G = 0.40 mm 



The optional version with magnifying effect is available so that even the smallest quantities of cerebrospinal fluid are clearly visible.

With the SPROTTE® cannula, the PAJUNK® development team has succeeded in manufacturing a spinal cannula which minimises the numerous side effects and renders spinal anaesthesia a comfortable and safe alternative to general anaesthesia. The proven success story confirms this: For the past 30 years the atraumatic SPROTTE® cannula has remained the unchallenged reference point and standard in spinal anaesthesia and lumbar puncture.

Many more ideas have been derived and perfected from the original SPROTTE® cannula.

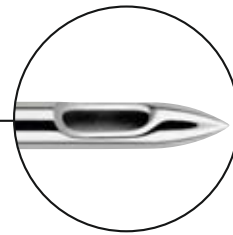
This has led to a group of products which has become the standard in anaesthesia and pain therapy finding use in a wide variety of applications in everyday clinical work. The SPROTTE® cannula has therefore made an essential contribution to the development of the field of spinal anaesthesia.



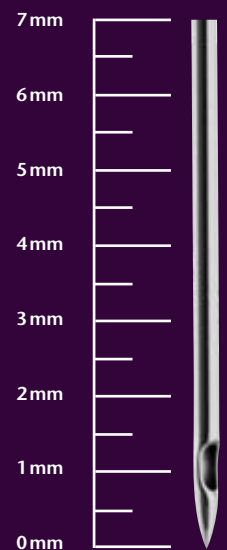
Depending on diameter and length there is a specific introducer available for every cannula size. The inner contours of the introducer hub have been designed so that the atraumatic tip of the SPROTTE® cannula cannot be damaged during the introduction process.



Cannula



The ogive-shaped tip geometry provides the cannula with its atraumatic qualities.



The optimal solution for every application:
A wide range of cannulas in different diameters and lengths accommodates the most exacting individual requirements. Special designs for paediatrics and SPROTTE® cannulas for overweight adults complete the range.

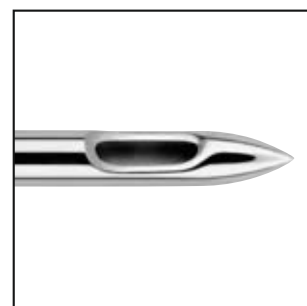
The original SPROTTE® cannula

The Guarantor for Atraumatic Puncture

The atraumatic qualities of the SPROTTE® cannula is proven histologically and functionally:

Ogive-shaped tip geometry

The closed tip of the cannula has the shape of an ogive. It displaces the tissue during the puncture process without injuring it. The multi-layered texture of the dura consisting of collagen and elastic fibres will close again after the cannula is removed.



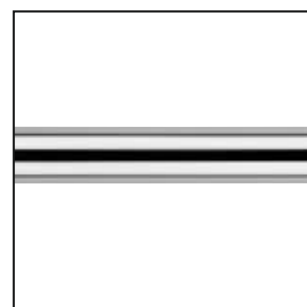
Lateral eye with rounded edge

The lateral opening of the SPROTTE® cannula is completely free of burrs and has atraumatically rounded edges. This quality characteristic provides perfect and smooth gliding features and minimises coring of tissue into the subaracnoid space.

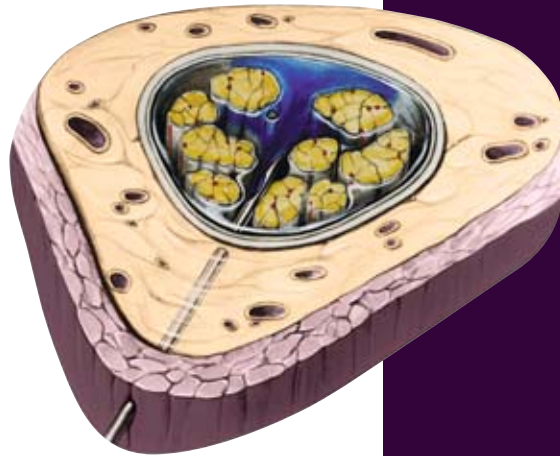


Polished stainless steel surface

The cannula is manufactured from first-class stainless steel which guarantees optimal stability. The surface and the inner lumen have been polished which reduces any surface roughness to a minimum. This ensures that the SPROTTE® cannula can be positioned optimally to ensure CSF – reflux is optimised by the greatly reduced internal surface roughness.

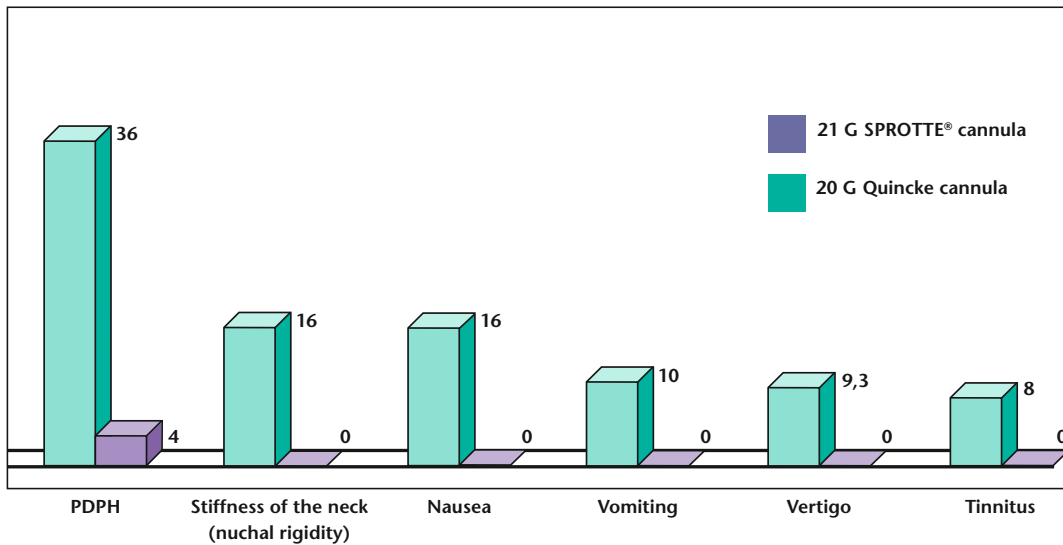


- G. Sprotte, R. Schedel, H. Pajunk, H. Pajunk. Eine "atraumatische" Universalkanüle für einzeitige Regionalanästhesien, Reg Anaesth. 1987;10(3):104-8
- Y. Hirasawa, Y. Katsumi, W. Küsswetter, G. Sprotte. Experimentelle Untersuchungen zur peripheren Nervenverletzung durch Injektionsnadeln, Reg Anaesth. 1990;13:11-15
- Ross BK, Chadwick HS, Mancuso JJ, Benedetti C. Sprotte Needle for Obstetric Anesthesia: Decreased Incidence of Post Dural Puncture Headache, Reg Anaesth. 1992 Jan-Feb;17(1):29-33.
- Lim M, Cross GD, Sold M. Postspinaler Kopfschmerz: Ein Vergleich der 24 G Sprotte-Kanüle mit einer 29 G Quincke-Kanüle, Anaesthesist 1992;41:539-43
- S. Wiesel, M.J. Tessler, L.J. Easdown. Postdural puncture headache: a randomized prospective comparison of the 24 gauge Sprotte and the 27 gauge Quincke needles in young patients, Can J Anaesth. 1993 Jul;40(7):607-11
- D.C. Campbell, M.J. Douglas, T.J. Pavy, P. Merrick, M.L. Flanagan, G.H. McMorland. Comparison of the 25-gauge Whitacre with the 24-gauge Sprotte spinal needle for elective Caesarean section: cost implications, Can J Anaesth. 1993 Dec;40(12):1131-5
- D.A. Harrison, B.T. Langham. Post-dural puncture headache: a comparison of the Sprotte and Yale needles in urological surgery, Eur J Anaesthesiol 1994;11:325-327
- D.H. Sears, M.I. Leeman, L.J. Jassy, L.A. O'Donnell, S.G. Allen, L.S. Reisner. The Frequency of Postdural Puncture Headache in Obstetric Patients: A Prospective Study comparing the 24-Gauge versus the 22-Gauge Sprotte Needle, J Clin Anesth. 1994;6(1):42-6
- C.M. Kumar, M. Metha. Ankylosing spondylitis: lateral approach to spinal anaesthesia for lower limb surgery, Can J Anaesth. 1995 Jan;42(1):73-6
- G. Pittoni, F. Toffeiletto, G. Calcarella, G. Zanette and G.P. Giron. Spinal Anesthesia in Outpatient Knee Surgery: 22-Gauge Versus 25-Gauge Sprotte Needle, Anesth Analg 1995;81:73-79
- T. Standl, S. Eckert, I. Rundshagen, J. Schulte am Esch. A directional needle improves effectiveness and reduces complications of microcatheter continuous spinal anaesthesia, Can J Anaesth. 1995 Aug;42(8):701-5
- M.Cesarini, R. Torrielli, F. Lahaye, J.M. Mene, C. Cabiro. Sprotte needle for intrathecal anaesthesia for Caesarean section: incidence of postdural puncture headache, Anaesthesia 1990 Aug;45(8):656-8
- J. Fog, L.P. Wang, A. Sundberg, C. Mucchiano. Hearing Loss After Spinal Anesthesia Is Related to Needle Size, Anesth Analg. (May) 1990;70(5):517-22



The effect is obvious:

In comparison with conventional cannulas the post spinal headache rate occurring with an original SPROTTE® cannula is reduced by a factor of 10.



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)

The use of atraumatic cannula will not only reduce post spinal headaches but, as has been proven, nuchal rigidity, nausea and vomiting can also be avoided. The recommendation to use atraumatic cannula can be justified from an economical point of view: the costs of medical treatment can be noticeably reduced by the prevention of unwanted side effects.

The reduction of post spinal headaches by using atraumatic cannula is proven: Class I evidence, Type A recommendation (Neurology 2000; 55... 909-914); this is valid for all diameters of the atraumatic cannula in use, from 20 Gauge (Strupp et al Neurology 2001; 57:2310-2312) to 27 Gauge (Flaatten et al, Acta Anaesthesiol Scand 2000;44:643-644).

- R. Puolakka, L.C. Andersson, and P.H. Rosenberg. Microscopic Analysis of Three Different Spinal Needle Tips After Experimental Subarachnoid Puncture, Regional Anesthesia and Pain Medicine, Vol 25, No 2 (March-April) 2000;pp 163-169
- M.A. Frölich and D.Caton. Pioneers in Epidural Needle Design, International Anesthesia Research Society, Anesth Analg 2001;93:215-20
- M.C. Vallejo, G. L. Mandell, D. P. Sabo and S. Ramanathan. Postdural Puncture Headache: A Randomized Comparison of Five Spinal Needles in Obstetric Patients 2000; Anesth. Analg 2000;91:916-20
- H. Jäger, K. Schimrigk, A. Haas. Das postpunktionelle Syndrom – selten bei der Verwendung der Punktionsnadel nach Sprotte, Akt Neurol 1991;18:61-64
- A. Engelhardt, S. Oheim, B. Neundörfer. Post-lumbar-puncture headache: experiences with Sprotte's atraumatic needle. Cephalalgia 1992;12:259
- B. Müller, K. Adelt, H. Reichmann, K.V. Toyka. Atraumatic needle reduces the incidence of post-lumbar puncture syndrome. J Neurol. 1994;241(6):376-80
- H.J. Braune, G.A. Huffmann. A prospective double-blind clinical trial, comparing the sharp Quincke needle (22G) with an "atraumatic" needle (22G) in the induction of post-lumbar puncture headache. Acta Neurol Scand 1992;86 (1):50-54

- K.V. Toyka, B. Müller, H. Reichmann, M. Strupp, O. Schüler and T. Brandt: Atraumatic Sprotte needle reduces the incidence of post-lumbar puncture headaches, Neurology 2002;59:1120-1121
- S. Öhman, J. Ernerudh, P. Forsberg, M. Roberg, M. Vrethem. Lower values for immunoglobulin M in cerebrospinal fluid when sampled with an atraumatic Sprotte needle compared with conventional lumbar puncture, Ann Clin Biochem 1995;32:210-212
- D. Vorwerk, J. Reul, R. Casser, C. Schink, R.W. Günther. Atraumatische Sprotte-Nadel zur Doppelkontrast-CT-Arthrographie des Schultergelenkes, Fortschr Röntgenstr 1993;158:490-492
- J.M. Prager, S. Roychowdhury, M.T.Gorey, G.M. Lowe, C.W. Diamond, A.Ragin. Spinal Headaches After Myelograms: Comparison of Needle Types, American Roentgen Ray Society (Nov.) 1996;167
- R.G.T. Fox, W. Reiche, M. Kiefer, T. Hagen und G. Huber: Indzidenz des Postmyelographiesyndroms und postmyelographischer Beschwerden nach lumbaler Punktion mit der bleistiftförmigen Nadel nach Sprotte im Vergleich zur Nadel nach Quincke, Radiologie 1996;36: 921-927
- J. Popp, M. Riad, K. Freymann, F. Jessen: Ambulante Durchführung einer diagnostischen Lumbalpunktion in der Gedächtnissprechstunde, Der Nervenarzt 5/2007
- E.R. Peskind, R. Rieske, J.F. Quinn, J. Kaye, C.M. Clark, M.R. Farlow, C. Decarli, C. Chabal, D. Vavrek, M.A. Raskind, D. Galasko. Safety and acceptability of the research lumbar puncture, Alzheimer Dis Assoc Disord. 2005;19(4):220-5

Safety through precision and cleanliness

Responsible Handling of Cerebrospinal Fluid

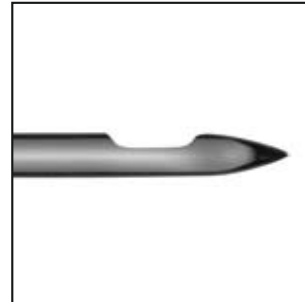
Free flow of cerebrospinal fluid

Time is a major factor in spinal anaesthesia. Great effort was therefore made in the design and manufacture to ensure that cerebrospinal fluid flows freely without obstruction. The time

between puncturing the spinal space and injection of the anaesthetic is substantially reduced when the SPROTTE® cannula is used:

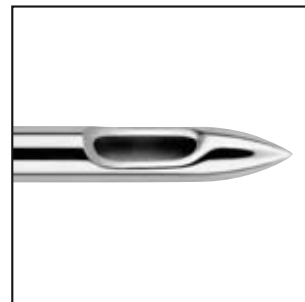
Inner lumen of the cannula

The smooth inner lumen of the cannula provides for maximum reduction in surface roughness. This allows optimal reflux of cerebrospinal fluid.



Lateral opening

The lateral opening of the cannula directly behind the tip ensures an unhindered flow of cerebrospinal fluid even if the arachnoidea may be partially blocking the opening.



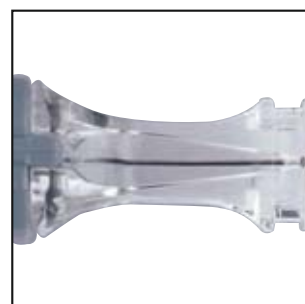
Optimal cannula hub

The small interior lumen of the plastic hub fills quickly with cerebrospinal fluid allowing it to be identified faster.

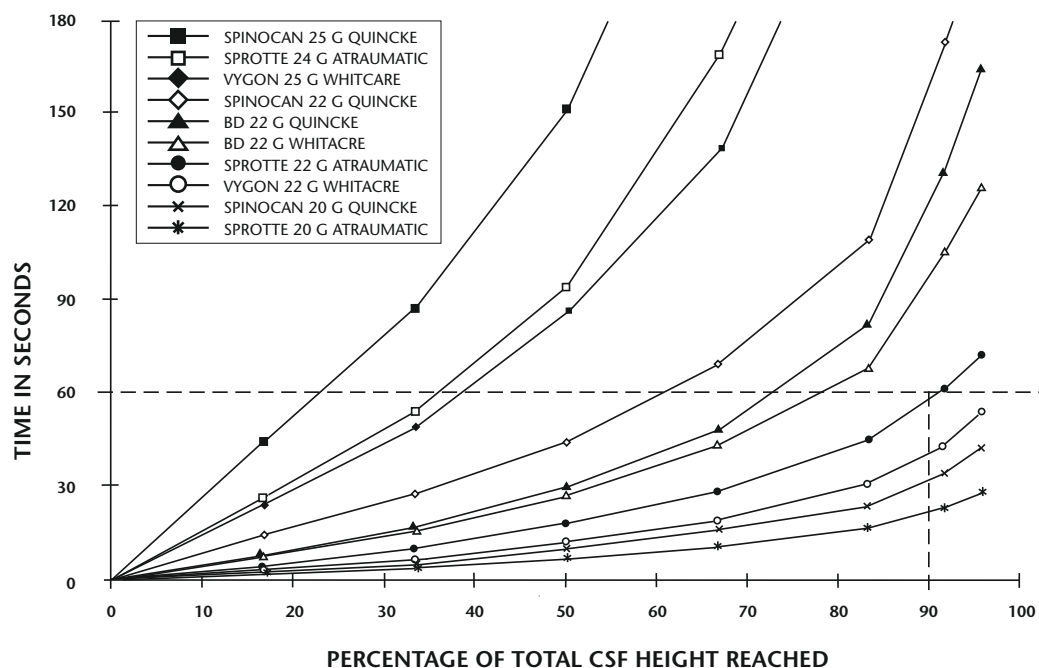


Magnifying effect

Unique to PAJUNK®: the cannula hub with a magnifying effect. Even the smallest amount of fluid is clearly identified through a viewing chamber in the cannula hub.



The Carson study



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

Maximum cleanliness

An essential quality aspect and safety feature directly correlates with the need for cleanliness. PAJUNK® operates strict requirements here.

- A special multistage cleaning process guarantees an absolutely clean puncture when using the SPROTTE® cannula and simultaneously minimises the risk to the nervous system. Following the cleaning operation the SPROTTE® cannula is subjected to a special drying process.
- The outer surface, tip of the stylet and lateral eye of the SPROTTE® cannula are all polished extensively. The extremely smooth steel surface obtained by this process minimises the risk of any metal particle detachment and release into the cerebrospinal fluid. Any potential tissue and blood serum protein deposit is also avoided at this time. The latest equipment, comprehensive process control and extensive checks within the PAJUNK® clean room guarantees maximum cleanliness and therefore improved safety for the patient.



Quality characteristic: an extensive range

The range in its entirety

The well-balanced range of products provides the anaesthetist with the option to use suitable cannula lengths and diameters for every conceivable indication.

SPROTTE® cannula



Size	Without introducer		With introducer		PU
	Item no.	Item no.	Item no.	Item no.	
25 G x 150mm			061151-29A		10
25 G x 123mm	151151-29A				10
25 G x 120mm	031151-29A		051151-29A		10
25 G x 103mm			041151-29A		25
25 G x 90mm	501151-29A		021151-29A		25
25 G x 70mm			021151-29B		25
25 G x 35mm	001151-29E				25
24 G x 150mm	141151-30A		131151-30A		10
24 G x 120mm	031151-30A		041151-30A		10
24 G x 103mm	521151-30A		021151-30A		25
24 G x 90mm	001151-30A		121151-30A		25
24 G x 70mm	001151-30B		021151-30B		25
24 G x 35mm	001151-30E				25
24 G x 25mm	001151-30D				25
22 G x 150mm	041151-30C		141151-30C		10
22 G x 120mm	031151-30C		131151-30C		10
22 G x 103mm	521151-30C		221151-30C		25
22 G x 90mm	001151-30C		021151-30C		25
22 G x 70mm	051151-30C		051151-30B		25
22 G x 50mm	071151-30C				25

SPROTTE® cannula w/magnifying effect



Size	Without introducer		With introducer		PU
	Item no.	Item no.	Item no.	Item no.	
29 G x 90mm			501151-28A		25
27 G x 123mm	231151-27A				10
27 G x 120mm			151151-27A		10
27 G x 103mm			141151-27A		25
27 G x 90mm			121151-27A		25
27 G x 70mm			121151-27B		25
27 G x 35mm	111151-27A				25
27 G x 25mm	101151-27A				25
25 G x 123mm	251151-29A				10
25 G x 120mm			171151-29A		10
25 G x 103mm			161151-29A		25
25 G x 90mm	521151-29A		511151-29A		25

Introducers for the SPROTTE® cannula

Size	Item no.	Cannula size	PU
0.70 x 30mm	071151-30L	27 G and 29 G	25
0.70 x 40mm	071151-30M	27 G and 29 G	25
0.80 x 30mm	021151-30L	24 G and 25 G	25
0.80 x 40mm	021151-30M	24 G and 25 G	25
1.00 x 30mm	001151-30L	22 G	25
1.00 x 40mm	001151-30M	22 G	25

PAJUNK GmbH
 Medizintechnologie
 Karl-Hall-Strasse 1
 D-78187 Geisingen/Germany
 Telefon +49 (0) 77 04/92 91-0
 Telefax +49 (0) 77 04/92 91-6 00
www.pajunk.com