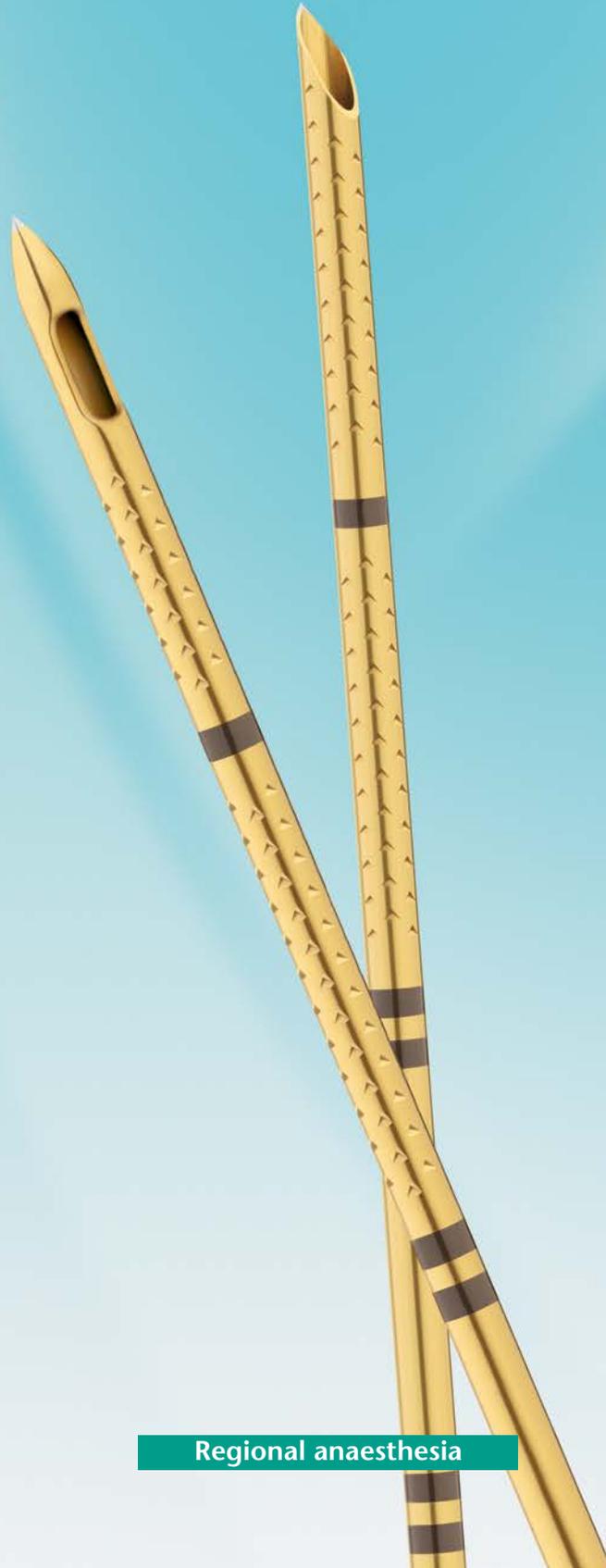


PAJUNK®

Sono Cannulas

*Cannulas for single shot
ultrasound guided puncture*



Regional anaesthesia

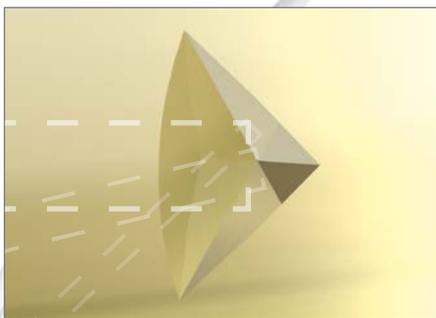
MADE IN GERMANY

Cornerstone Reflectors

Sono cannulas with maximum echogenicity

The visibility of cannula tips in ultrasound guided puncture is very important in preventing damage to neurons and blood vessels.¹ As even cannulas that are visible under ultrasound cannot always be identified at angles of 45° and above², this property has become a key decision-making criterion in the selection of cannulas in practice.³

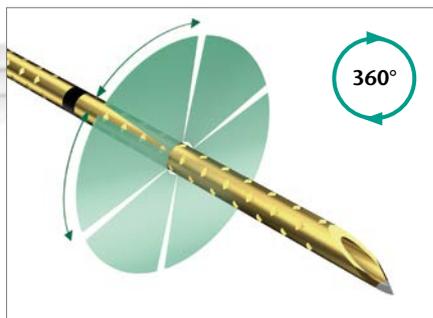
The patented Cornerstone Technology developed by PAJUNK® together with Dr. Chris Mitchell was designed specifically to solve this problem, and produces excellent visibility irrespective of the insertion angle.⁴ Sono cannulas have a high degree of precision even at steep insertion angles. Both the shaft and tip of the cannula are very clearly visible.⁵ In this way, Sono cannulas make an important contribution to the safety of the application.⁶



Echogenic Cornerstone Geometry

The embossed structures in the Cornerstone Reflectors form three surfaces which meet each other at a 90° angle.

➔ This guarantees direct or indirect reflection of the ultrasound waves even at very steep insertion angles.²



Sophisticated 360° arrangement

Both cannula segments are graduated all-around with evenly offset Cornerstone Reflectors. The number and layout of these reflectors is matched precisely to the relevant cannula diameter.

➔ Perfect cannula identification is guaranteed in every position.



Visibility irrespective of the insertion angle

The Cornerstone Reflectors are designed that the ultrasound waves are very well reflected even with an insertion angle of 60° to 70°.²

➔ Ultrasound waves are reflected along a total length of 20 mm. Cannula shaft and cannula tip can be clearly identified.

1 Wiesmann et al., Compound imaging technology and echogenic needle ..., 2013; 38(5): 452–455

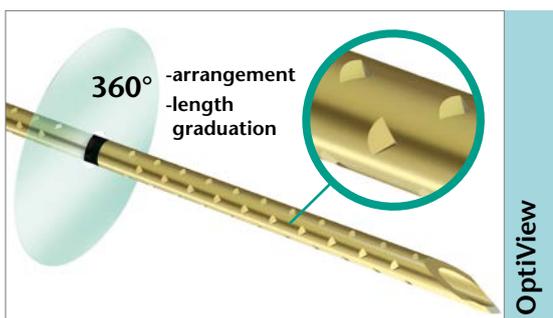
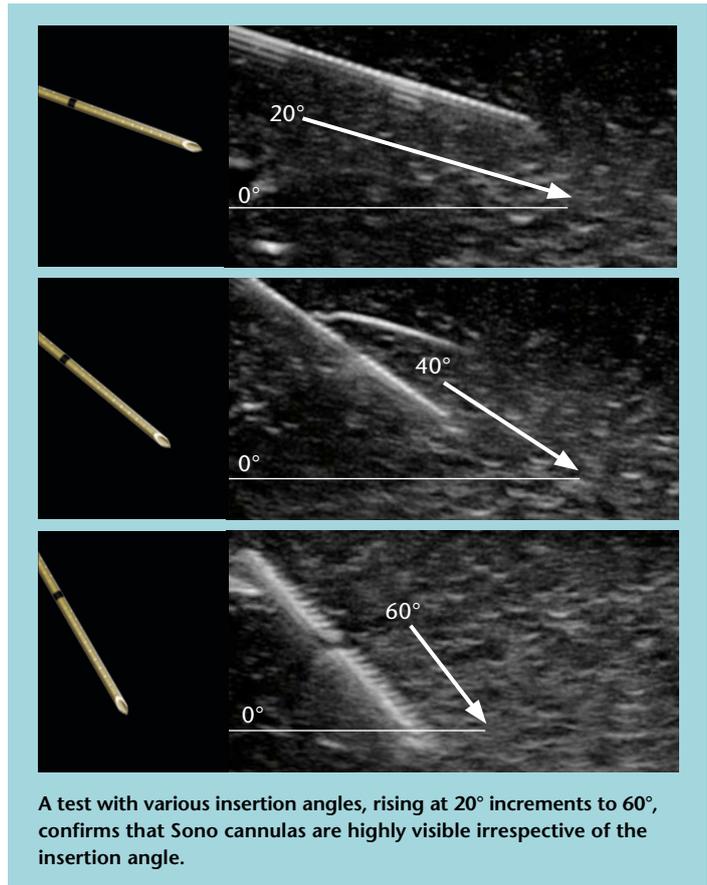
2 Uppal, Sondakoppam, Ganapathy, Effect of beam steering on ..., 2014; 61(10): 909–915

3 Sviggum, Ahn, Dilger, Smith, Needle echogenicity in sonographically ..., 2013; 32(1): 143–148

4 Hebard, Hocking, Echogenic technology can improve needle visibility ..., 2011; 36(2): 185–189

5 Edgcombe, Hocking, Sonographic identification of needle tip ..., 2010; 35(2): 207–211

6 Hocking, Mitchell, Optimizing the safety and practice ..., 2012, 604



- ➔ Echogenic, three-dimensional Cornerstone Geometry
- ➔ 360° configuration, arranged evenly around the cannula shaft
- ➔ Aligned to the cannula diameter
- ➔ Two 1-cm segments for positioning
- ➔ Cornerstone Reflectors are embossed as far as the tip of the cannula

= Optimum cannula visibility from shaft to tip, irrespective of the insertion angle

- ➔ Special configuration of the Cornerstone Reflectors for optimum 360° sonographic visibility
- ➔ Ultrasound waves are reflected along a length of 20 mm
- ➔ Clear identification of cannula shaft and tip
- ➔ Reflexion especially at steep insertion angles
- ➔ 360° length graduation for optimum positioning

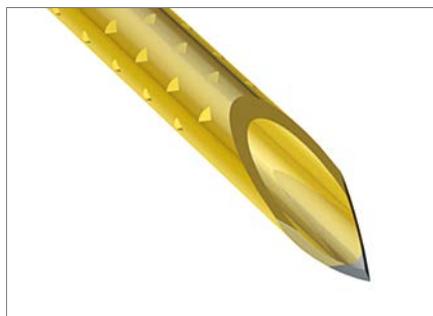
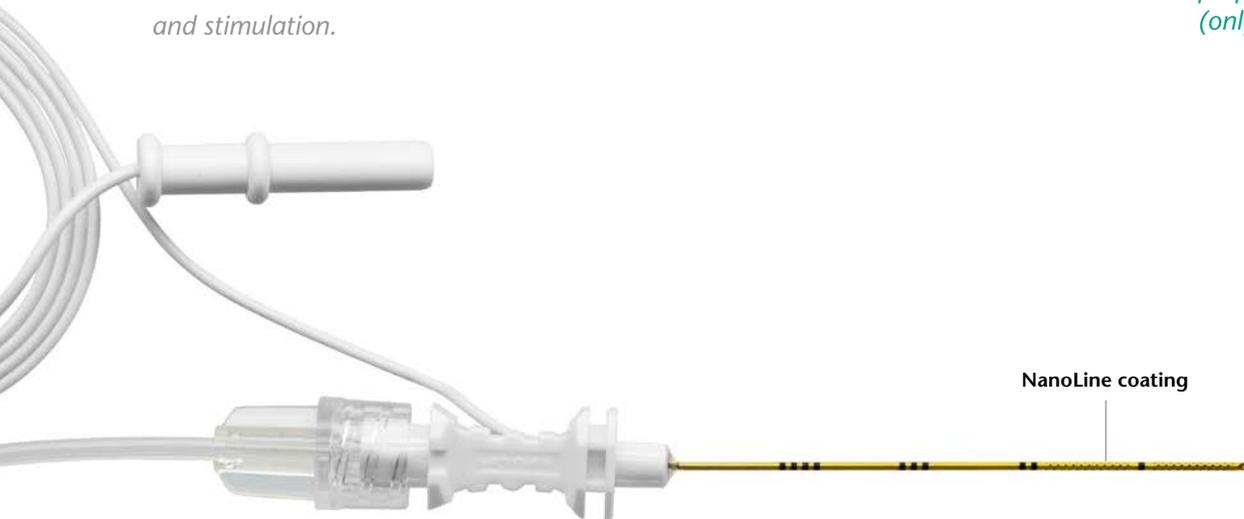
Dual guidance

Precise nerve stimulation with NanoLine

The echogenic Cornerstone Cannula is used to identify the relevant nerve under ultrasound, and in a second step the "dual guidance" procedure can be performed to check the accuracy of cannula placement by means of nerve stimulation.

To this end, the distance from the nerve is deduced from the lowest current strength required for stimulation. The NanoLine thin-coating technology developed by PAJUNK® offers considerable benefits with regard to accuracy of stimulation, because it allows the insulating layer to be reduced to a minimum without reducing functionality. This extremely thin plastic layer, which is applied to every internal and external part of the device except the bare tip, allows highly accurate puncture and stimulation.

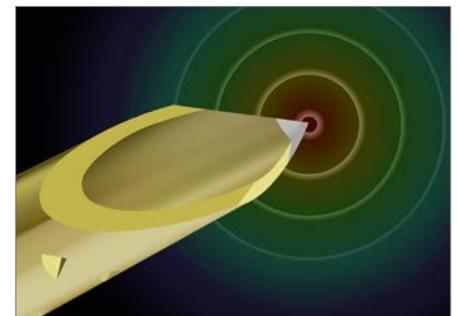
- ➔ Combination of ultrasound and stimulation techniques
- ➔ Optimisation of puncture accuracy
- ➔ Better safety in use
- ➔ Nerve stimulator MultiStim ECO, designed specially for combination procedures
- ➔ Accurate stimulation and excellent gliding properties with NanoLine (only from PAJUNK®)



Echogenic cannula tip

The facet grinding has two inclination angles, and is coated with NanoLine technology, apart from the tip, which is bare.

- ➔ Optimum conditions for outstanding cannula tip visibility.



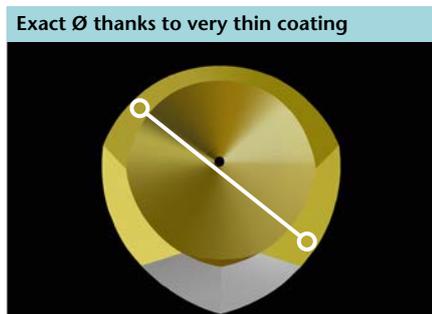
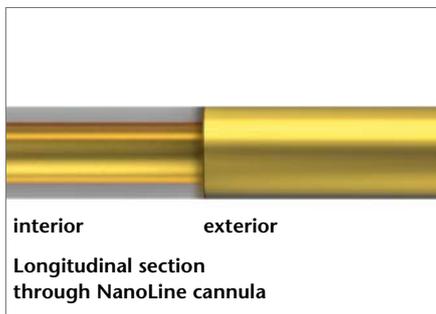
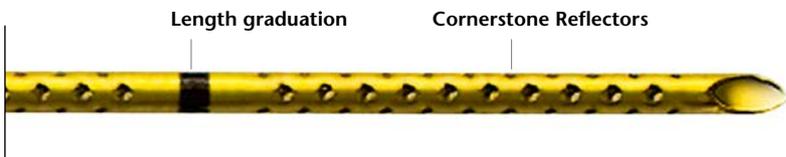
Precise stimulation

The very thin NanoLine coating guarantees a 100% insulation. The contact point at the cannula tip remains bare.

- ➔ Stimulation takes place only via the electroconductive puncture tip, generating a highly precise electrical field.



MultiStim ECO is a compact nerve stimulator developed by PAJUNK®, an easy-to-use device that meets the demands of combined procedures.



Coated inner lumen

The thin-coating technology used, means that even the inner lumina of cannulas can be coated.

➔ This smooths out any unevenness and allows better flow of the anaesthetic.

Reduced puncture force – increased glide properties

The very thin coating means that the exterior diameter is no different from when conventional coating techniques are used. It also produces an extreme surface smoothness.

➔ NanoLine cannulas glide easily through tissue and do not require great puncture force.

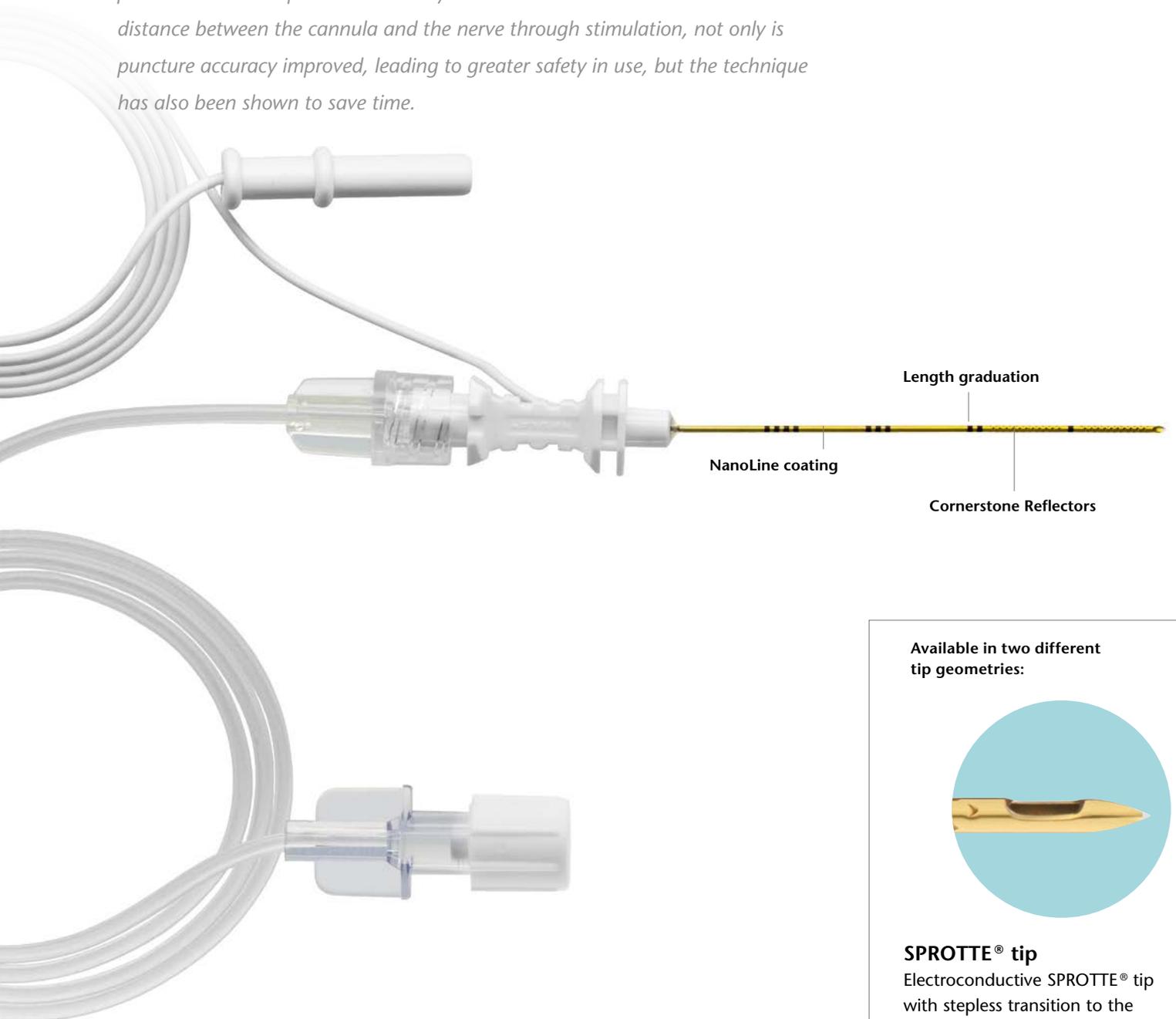
The advantages of NanoLine:

- ➔ Layer thickness is reduced to a minimum
- ➔ There is no change to the external diameter of the cannula
- ➔ The same excellent insulation properties as with conventional procedures
- ➔ A smooth surface to reduce the puncture force
- ➔ Extremely accurate stimulation via the contact point at the tip of the cannula

SonoPlex cannulas

Double safety as a result of stimulation and ultrasound

SonoPlex cannulas were developed by PAJUNK® especially for single shot applications and for the combination of ultrasound and stimulation techniques in peripheral block anaesthesia (dual guidance). This is because, as the user has a visual presentation of the patient's anatomy and is at the same time able to check the distance between the cannula and the nerve through stimulation, not only is puncture accuracy improved, leading to greater safety in use, but the technique has also been shown to save time.

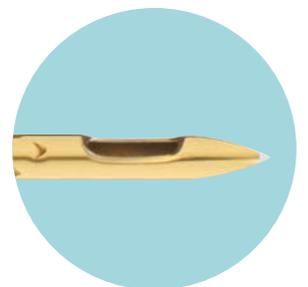


Length graduation

NanoLine coating

Cornerstone Reflectors

Available in two different tip geometries:



SPROTTE® tip

Electroconductive SPROTTE® tip with stepless transition to the coating.

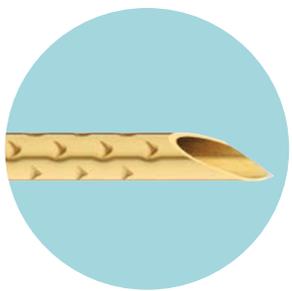
➔ This enables atraumatic, precise localisation of the nerve.

SonoBlock cannulas

Single shot ultrasound guided puncture

SonoBlock cannulas were developed by PAJUNK® specially for single shot administration of peripheral block anaesthesia carried out solely with ultrasound and without stimulation. They are available either with a SPROTTE® tip or facet grinding.

The standard version, with NanoLine coating and Cornerstone Reflectors, produces maximum sonographic visibility in practice.



Facet grinding

Electroconductive precision tip (facet) with stepless transition to the coating.

➔ This special facet grinding reduces the risk of injury to a minimum compared to conventional sharp cannulas.



The adaptable injection tube enables aspiration or injection to be carried out during the puncture process. It can be removed by the anaesthetist at any time if it is getting in the way of the work.

SonoTAP cannulas

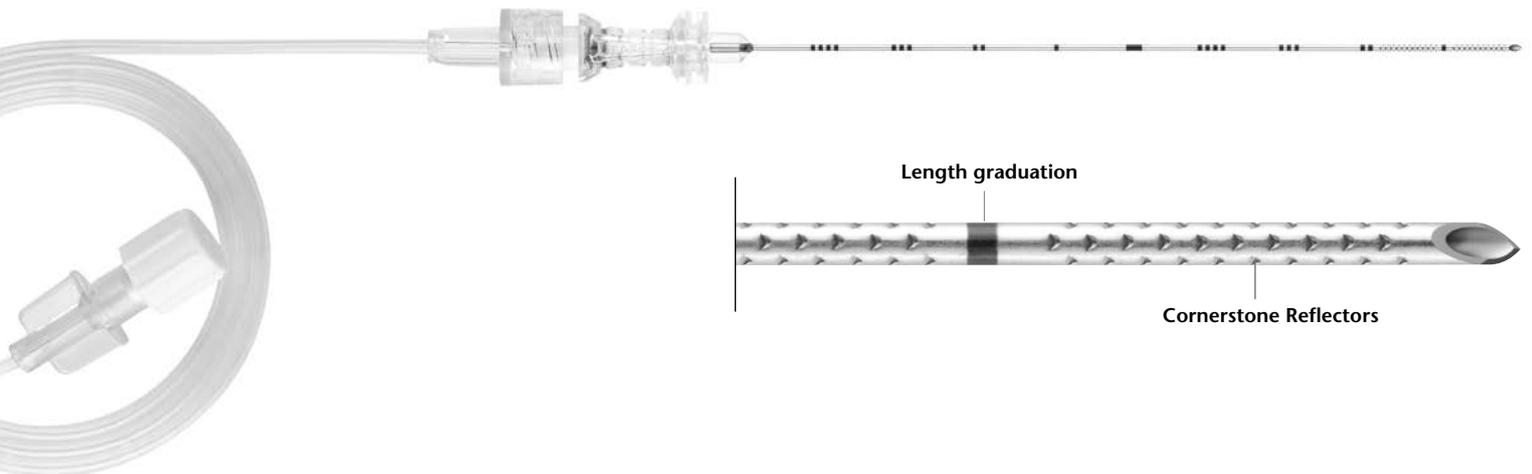
Precision for abdominal blocks

Abdominal blocks, in particular TAP blocks (transverse abdominis plane blocks) and rectus sheath blocks, are increasingly used for the management of post-operative pain from abdominal surgery. They are applicable to day surgery, have a low side effect profile and offer an alternative to epidural anaesthesia. Ultrasound guidance has improved the accuracy of abdominal blocks but the visibility of the cannula tip remained a problem. As a pioneer in regional anaesthesia, PAJUNK® has developed the SonoTAP cannula that focuses on the optimisation of visibility of the cannula tip for safe and reliable pain relief.

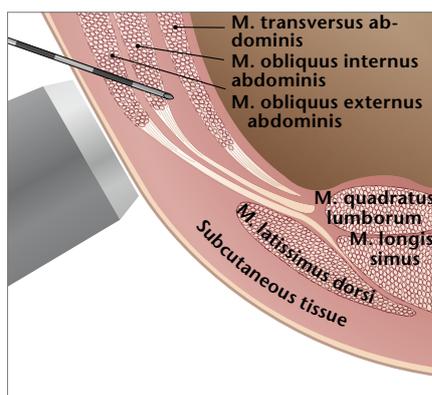
Applications:

- ➔ Unilateral blocks
- ➔ Bilateral blocks

SonoTAP cannulas are supplied as standard with an injection tube.



Performance of an ultrasound guided TAP block (subcostal, anterior access)



SonoTAP cannula with facet grinding

The injection space for the TAP block is limited and lies relatively deep.

➔ The facet grinding of the SonoTAP cannula has the following features: Firstly, it enables clear identification under ultrasound, and secondly it enables precise localisation thanks to the fascial click on penetration.

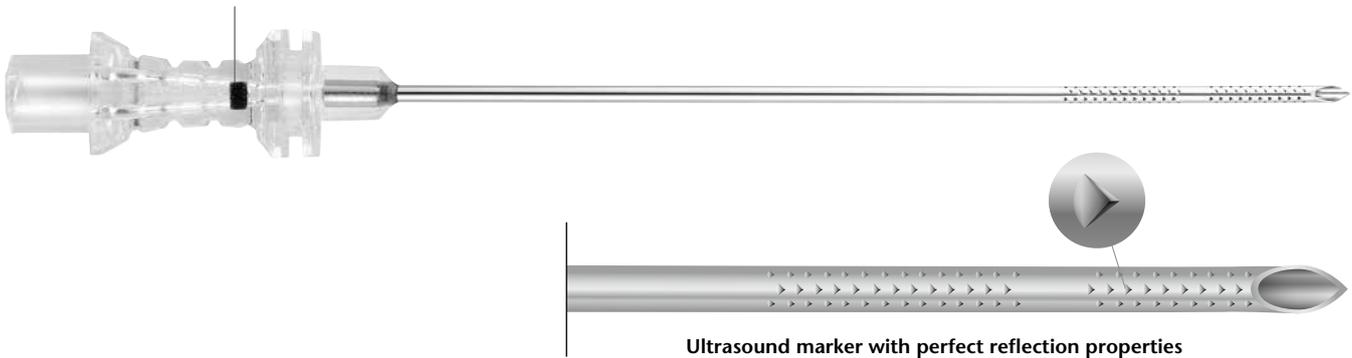
VascularSono cannulas

Central venous and arterial puncture under ultrasound

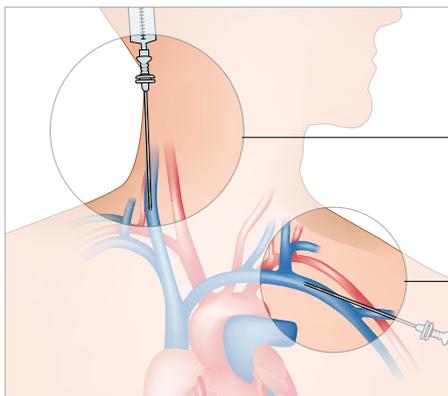
The use of ultrasound to position central venous catheters is a proven way of improving patient welfare⁷ while reducing the rate of failed puncture attempts.⁸ VascularSono is a vascular puncture cannula developed by PAJUNK® that has outstanding sonographic visibility. The ultrasound waves are very clearly reflected in this procedure both in-plane and out-of-plane by the cannula shaft and the tip, even if the insertion angle is steep.⁵

- ➔ Innovative generation of cannulas with Cornerstone Reflectors
- ➔ Outstanding ecogenic properties
- ➔ Guaranteed visibility even with steep insertion angles
- ➔ Minimises the risk of complications

The black marking on the cannula hub makes it easier to check the position of the cannula grinding



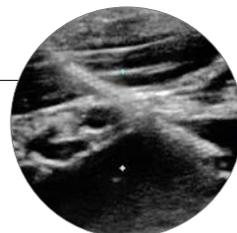
Use of the VascularSono cannula out-of-plane and in-plane



Out-of-plane view of the VascularSono in the vena jugularis interna.



In-plane view of the VascularSono in the vena subclavia.



7 Schummer, Ultraschall und Lagekontrolle bei der Anlage zentraler Venenkatheter ..., 2009; 682

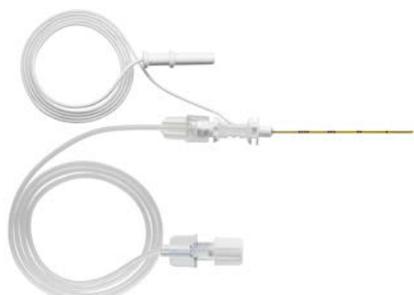
8 Schummer, Ultraschall und Lagekontrolle bei der Anlage zentraler Venenkatheter ..., 2009; 680

9 Edgcombe, Hocking, Sonographic identification of needle tip ..., 2010; 35(2): 207–211

Single shot anaesthesia

All the information at a glance

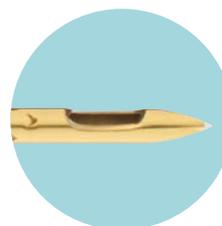
SonoPlex and SonoBlock



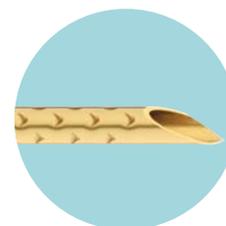
SonoPlex cannula



SonoBlock cannula



SonoPlex cannula with SPROTTE® tip



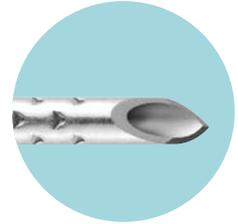
SonoPlex cannula with facet grinding

Product	Size	Item No.	PU
SonoPlex			
Facet grinding and Cornerstone Reflectors	24 G x 25mm	001185-75	10
	24 G x 40mm	001185-78	10
	22 G x 40mm	001185-70	10
	22 G x 50mm	001185-74	10
	22 G x 80mm	001185-71	10
	21 G x 100mm	001185-77	10
	21 G x 80mm	001185-88	10
	20 G x 120mm	001185-72	10
	20 G x 150mm	001185-76	10

SPROTTE® tip and Cornerstone Reflectors	24 G x 40mm	001185-30G	10
	22 G x 50mm	001185-31G	10
	22 G x 70mm	001185-31H	10
	22 G x 90mm	001185-31J	10

Product	Size	Item No.	PU
SonoBlock			
Facet grinding and Cornerstone Reflectors	22 G x 40mm	001180-70	10
	22 G x 50mm	001180-74	10
	22 G x 80mm	001180-71	10
	21 G x 100mm	001180-77	10
	20 G x 120mm	001180-72	10
SPROTTE® tip and Cornerstone Reflectors	24 G x 40mm	001180-30G	10
	22 G x 50mm	001180-31G	10
	22 G x 70mm	001180-31H	10
	22 G x 90mm	001180-31J	10

SonoTAP



SonoTAP cannula
with facet grinding

Product	Size	Item No.	PU
SonoTAP			
Facet grinding and Cornerstone Reflectors	24 G x 40 mm	1185-3Y040	10
	22 G x 50 mm	1185-3E050	10
	22 G x 80 mm	1185-3E080	10
	21 G x 110 mm	1185-3F110	10
	21 G x 150 mm	1185-3F150	10

VascularSono



Product	Suitable for guidewires up to	Size	Item No.	PU
VascularSono				
	0.018 inch	21 G x 35 mm	1187-4F035	25
	0.018 inch	21 G x 70 mm	1187-4F070	25
	0.035 inch	18 G x 40 mm	1187-4K040	25
	0.035 inch	18 G x 70 mm	1187-4K070	25
	0.035 inch	18 G x 100 mm	1187-4K100	25

Studies

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- **Fuzier R., Casalprim J., Bataille B., Harper I., Magues J. P.** The echogenicity of nerve blockade needles, *Anesth.* 2015; 70: 462–466
- **Hebard S., Hocking G.** Echogenic technology can improve needle visibility during ultrasound-guided regional anesthesia, *Reg. Anesth. Pain Med.* 2011 March–April; 36(2): 185–189
- **Hebard S., Hocking G., Murray K.** Two-dimensional mapping to assess direction and magnitude of needle tip error in ultrasound-guided regional anaesthesia, *Anaesth. Intensive Care* 2011; 39(6): 1076–1081
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- **Sviggum H. P., Ahn K., Dilger J. A., Smith H. M.** Needle echogenicity in sonographically guided regional anesthesia: blinded comparison of 4 enhanced needles and validation of visual criteria for evaluation, *J. Ultrasound Med.* 2013 Jan; 32(1): 143–148
- **Tsui B. C. H., Tsui J.** Reusable phantom with feedback signal for ultrasound needle tip control, *Reg. Anesth. Pain Med.* 2011; 36(6): 630–631
- **Uppal V., Sondekoppam R. V., Ganapathy S.** Effect of beam steering on the visibility of echogenic and non-echogenic needles: a laboratory study, *Can. J. Anesth.* 2014 Oct; 61(10): 909–915
- **Wiesmann T., Borntträger A., Zoremba M., Neff M., Wulf H., Steinfeldt T.** Compound imaging technology and echogenic needle design: effects on needle visibility and tissue imaging, *Reg. Anesth. Pain Med.* 2013 Sep–Oct; 38(5): 452–455



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