

PAJUNK®

BO-Inject

*Therapeutic injection
of botulinum toxin*



Neurology

MADE IN GERMANY

BO-NanoInject and BO-SonoInject

Opting for maximum efficacy

When injecting botulinum toxin (BoNT), the exact placement of the cannula is extremely important in order to minimise side effects and achieve the best possible therapeutic effects with an economical dosage.¹ In order to achieve optimum efficacy, the “Botulinum toxin working party” strongly recommends the administration of BoNT in the immediate vicinity of neuromuscular synapses, because at a distance of only 0.5 cm the effect is reduced by 50%. However, pinpoint administration requires a knowledge of the distribution of the neuromuscular synapses of the target muscle. The working party therefore recommends the use of electrostimulation and ultrasound as the most appropriate localisation technique.²

With its NanoLine and Cornerstone Technology, PAJUNK® offers a totally convincing range of cannulas where precision and visibility are concerned during stimulation and under ultrasound. With these monopolar, echogenic cannulas, PAJUNK® has assumed a pioneering role in regional anaesthesia. BO-SonoInject and BO-NanoInject are two cannula types specially developed for the injection of BoNT, combining the expertise of PAJUNK® with the special requirements of this form of administration.

Application area for BoNT

- ➔ *Spasticities of the upper and lower extremities*
- ➔ *Focal dystonia*

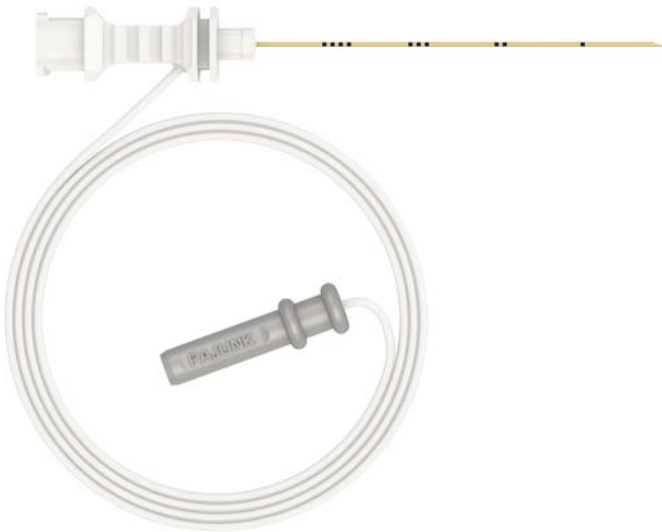
The product variants

Both cannula types are in each case available in two alternative variants:

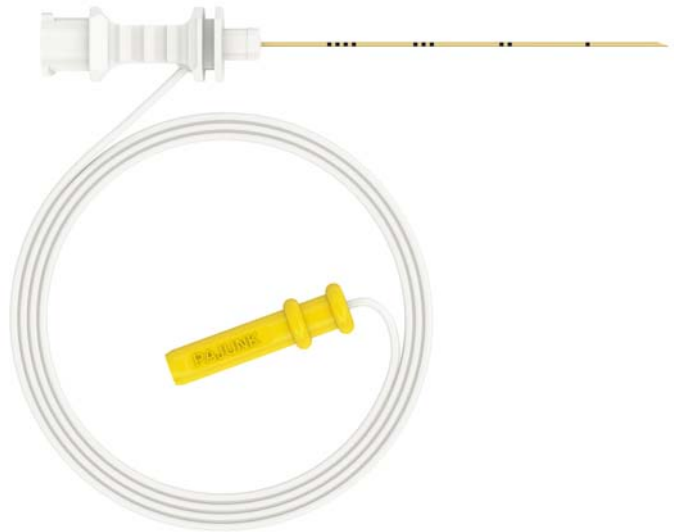
- ➔ With EMG cable for a combined application of electromyography and muscle stimulation
- ➔ With stimulation cable for nerve stimulation (in combination with MultiStim Switch)

BO-NanoInject

Short bevel cut



EMG cable



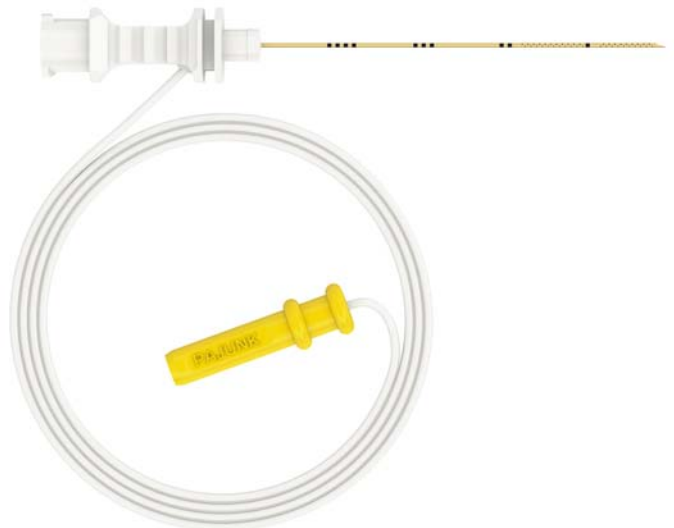
Stimulation cable

BO-SonolInject

Cornerstone Reflectors
and short bevel cut



EMG cable



Stimulation cable

BO-NanoInject

High-precision stimulation and perfect slide properties

The very thin NanoLine coating of BO-NanoInject, a technology specially developed and patented by PAJUNK®, ensures maximum insulation of the cannula. Nerve or muscle stimulation is provided solely via the electrically conductive contact point and the grinding areas on the cannula tip, creating a high-precision electrical field.

- ➔ Increase of application safety
- ➔ Precise stimulation and excellent gliding properties with NanoLine (only at PAJUNK®)
- ➔ Magnetisable cannula
- ➔ Combination of EMG and muscle stimulation
- ➔ Optimum puncture accuracy by precise nerve stimulation

Small dead space volume

Specially shaped cannula hub

- ➔ BoNT left in the cannula is minimised
- ➔ Optimises cost-effectiveness

High stability with small diameter

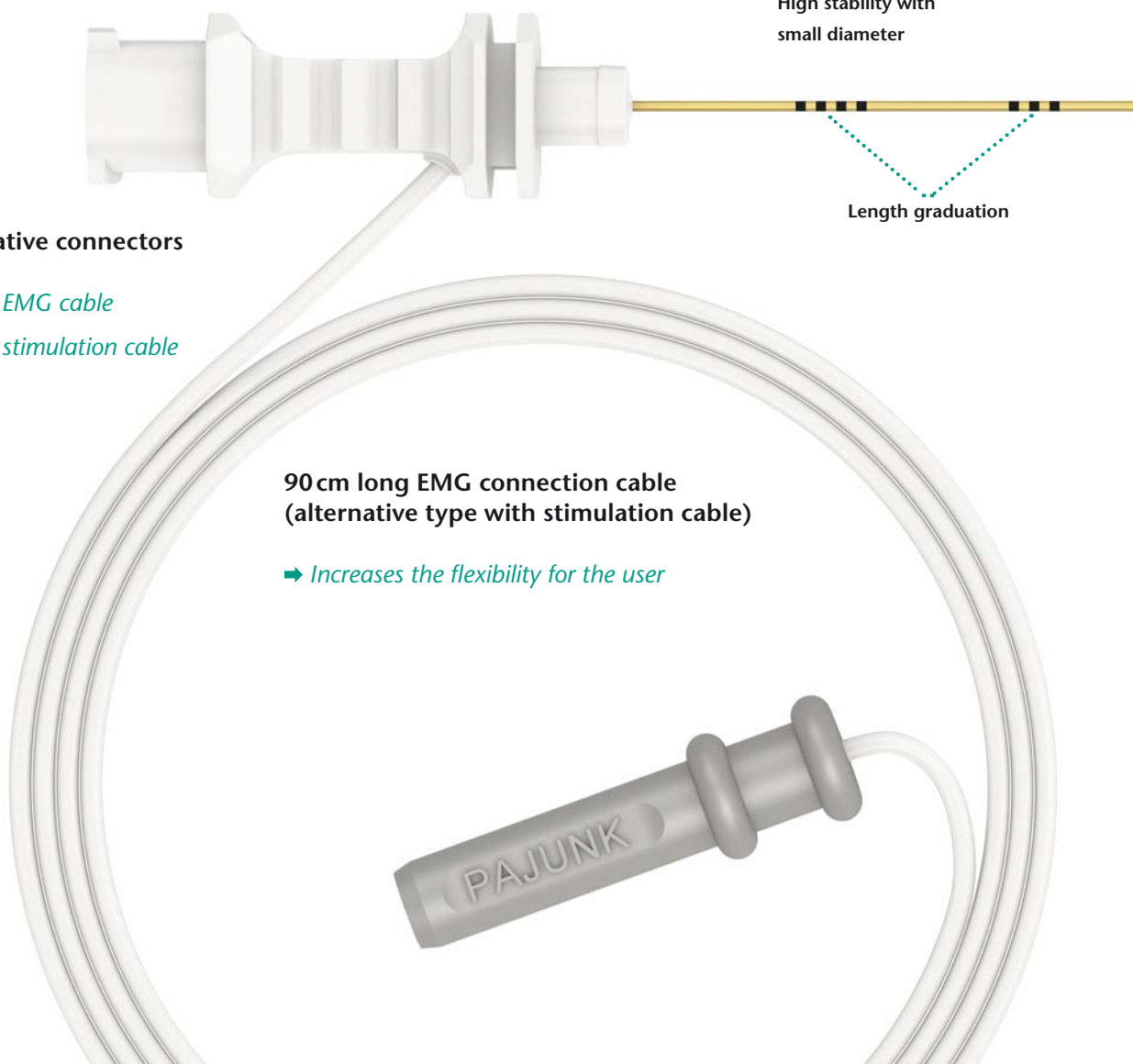
Length graduation

Alternative connectors

- ➔ With EMG cable
- ➔ With stimulation cable

90 cm long EMG connection cable (alternative type with stimulation cable)

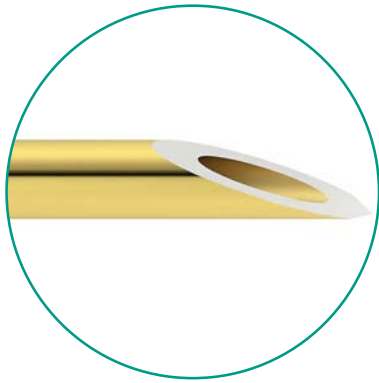
- ➔ Increases the flexibility for the user



Optimised short bevel cut geometry

Bevelled tip with back cut

→ *Reduces pain to a minimum while puncturing*



bevelled tip



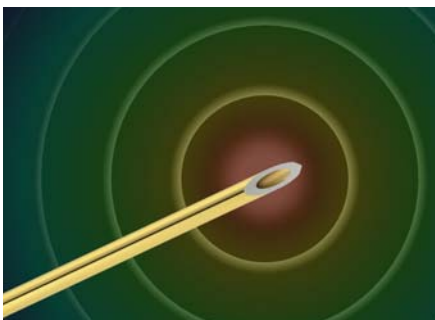
back cut bevel



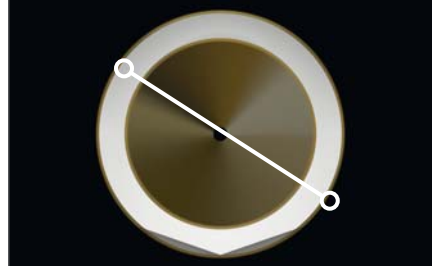
NanoLine coating



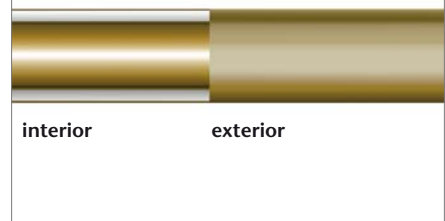
The advantages of NanoLine coating



Exact \varnothing due to very thin coating



Longitudinal section through NanoLine cannula



Precise stimulation

The very thin NanoLine coating guarantees total insulation except for the entire grinding area and the bare tip.

→ *Allows precise derivation of the EMG signal or similarly exact stimulation*

Minimum coating thickness

The outer diameter stays unchanged in contrast to conventional coating processes.

→ *Evenly smooth surface*
 → *NanoLine cannulas glide easily through tissue*
 → *Do not require great puncture force*

Coated inner lumen

The thin coating technology used allows coated inner lumen

→ *Smooths out any unevenness*
 → *Allows better flow of the BoNT*

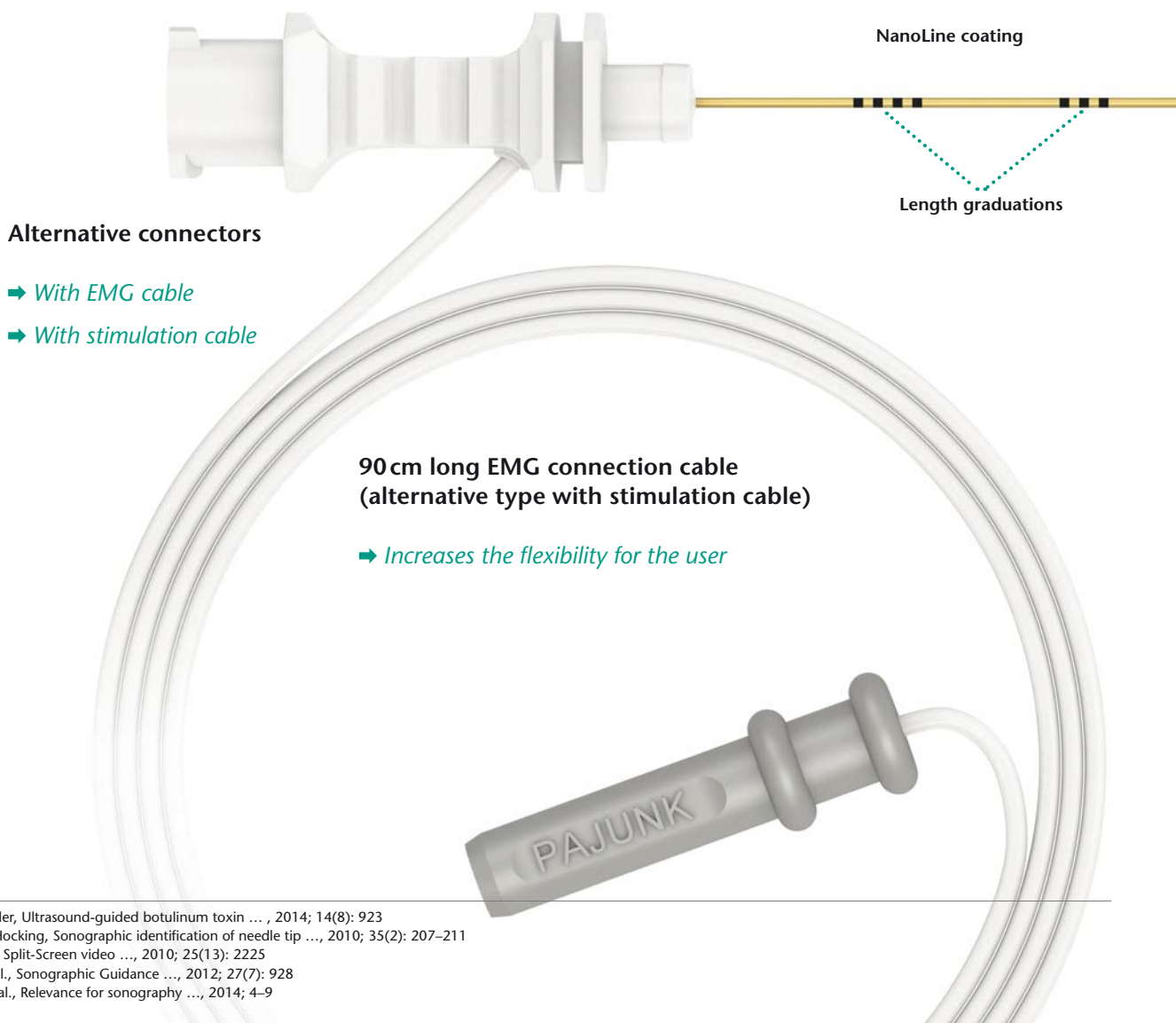
BO-SonoInject

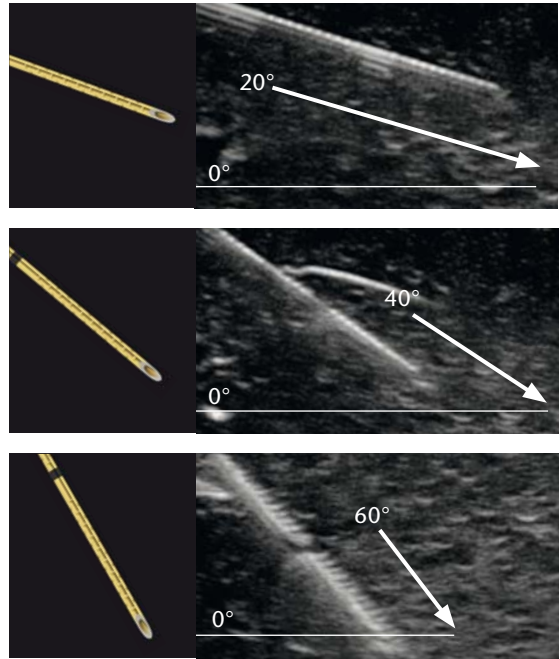
Combines benefits of ultrasound and electrostimulation

The use of ultrasound is recommended in principle for all BoNT injections, as it allows the simple, non-invasive visualisation of muscles, glandular tissue, and the surrounding structures in real time. The main benefit is that the whole process of administration of botulinum toxin can be visualised by ultrasound with due allowance for the patient's individual anatomy. Verification and documentation of the injection site and the quantity injected are also possible.⁴ With BO-SonoInject, PAJUNK® offers a special cannula for the combined use of ultrasound and electrostimulation and thus provides the user with double security.

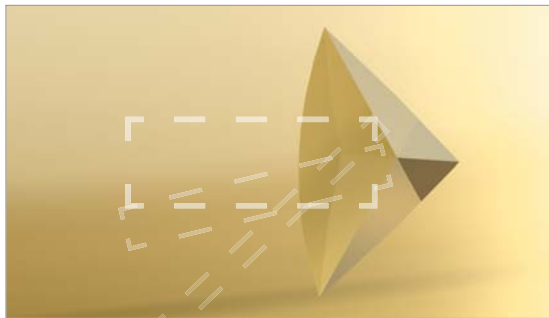
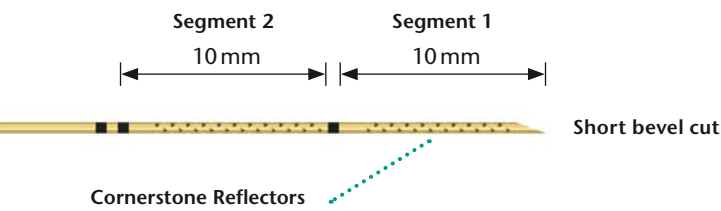
Specific benefits of ultrasound technology

- ➔ Real-time visualisation of the target muscles and the cannula
- ➔ Visualisation of bones, blood vessels and nerves in the immediate vicinity of the target muscle⁶
- ➔ Real-time visualisation of the emission and distribution of BoNT⁷
- ➔ Allows cost reductions⁶
- ➔ Economical dosage of BoNT⁸





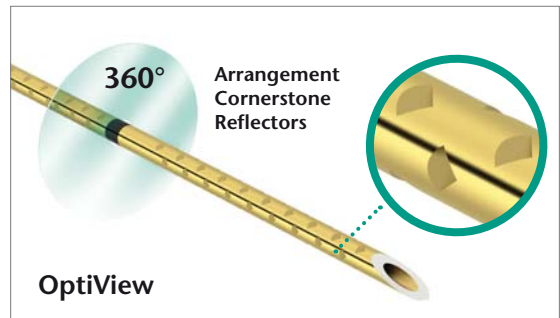
A test with various insertion angles, rising at 20° increments to 60° confirms that BO-SonoInject cannulas are highly visible, irrespective of the insertion angle.



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 ultrasonic waves even at very steep insertion angles*



OptiView

The first two cannula segments – both 10 mm long – are arranged 360° evenly around the cannula shaft. Quantity and arrangement are precisely aligned to the cannula diameter.

- ➔ *Reflection of the ultrasonic waves on a length of 20 mm*
- ➔ *Optimum cannula visibility from shaft to tip, irrespective of the insertion angle⁵*
- ➔ *Perfect cannula identification is guaranteed in every position*

BO-Inject All information at a glance

BO-Inject

Product	Size	Item No.	PU	Size	Item No.	PU
BO-SonoInject	for EMG devices			for MultiStim Switch		
Injection cannula,	27G x 37mm	001188-90	10	27G x 37mm	001191-90	10
Cornerstone Reflectors,	25G x 60mm	001188-89	10	25G x 60mm	001191-89	10
short bevel cut, cable 90cm long	25G x 50mm	001188-81	10	25G x 50mm	001191-81	10
	25G x 37mm	001188-82	10	25G x 37mm	001191-82	10
	24G x 50mm	001188-85	10	24G x 50mm	001191-85	10
	24G x 40mm	001188-78	10	24G x 40mm	001191-78	10
	24G x 25mm	001188-75	10	24G x 25mm	001191-75	10
BO-NanoInject						
Injection cannula, short bevel cut,	27G x 37mm	001168-90	10	27G x 37mm	001169-90	10
cable 90cm long	25G x 50mm	001168-81	10	25G x 50mm	001169-81	10
	25G x 37mm	001168-82	10			
	24G x 50mm	001168-85	10	24G x 50mm	001169-85	10
	24G x 25mm	001168-75	10	24G x 25mm	001169-75	10

Studies

- **Edgcombe H., Hocking G.** Sonographic identification of needle tip by specialists and novices: a blinded comparison of 5 regional block needles in fresh human cadavers, *Reg. Anesth. Pain Med.* 2010 March–April; 35(2): 207–211
- **Fietzek U., Schroeder S., Wissel J., Heinen F., Berweck S.** Split-screen video demonstration of sonography-guided muscle identification and injection of botulinum toxin, *Movement Disorders* 2010; 25(13): 2225–2228
- **Fujimoto H., Mezaki T., Yokoe M., Mochizuki H.** Sonographic guidance provides a low-risk approach to the longus colli muscle, *Movement Disorders* 2012; 27(7): 928–29
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- **Schroeder A. S., Berweck S., Lee S. H., Heinen F.** Botulinum Toxin Treatment of Children with Cerebral Palsy – a Short Review of Different Injection Techniques, *Neurotoxicity Research* 2006, 9(2,3): 189–196
- **Volkman J.** Extrapyramidalmotorische Störungen Dystonie, Entwicklungsstufe S1, Leitlinien für Diagnostik und Therapie in der Neurologie, *Deutsche Gesellschaft für Neurologie* 2012 September: 1–11
- **Walter U., Dressler D.** Ultrasound-guided botulinum toxin injections in neurology: technique, indications and future perspectives, *Expert Rev. Neurother* 2014; 14(8): 923–936
- **Wissel J., auf dem Brinke M., Hecht M., Herrmann C., Huber M., Mehnert S., Reuter I., Schramm A., Stenner A., van der Ven C., Winterholler M., Kupsch A.** Botulinum-Neurotoxin in der Behandlung der Spastizität im Erwachsenenalter, *Nervenarzt* 2011, 82: 481–495

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

PAJUNK® Medical Produkte GmbH
 D.A.CH • BeNeLux
 Karl-Hall-Strasse 1
 D-78187 Geisingen / Germany
 Phone +49 (0) 77 04/80 08-0
 Telefax +49 (0) 77 04/80 08-150
www.pajunk.com