CHECKPOINT SURGICAL®

PRODUCT PORTFOLIO

NERVE CARE. **EMPOWERED.**

SUPPORTING THE CONTINUUM OF INTRAOPERATIVE NERVE CARE

The original CHECKPOINT® Nerve Stimulator inspired surgeons to think differently about intraoperative nerve care. Checkpoint's safe nerve stimulation opened opportunities for protecting, assessing and repairing nerves, with surgeons themselves discovering new and innovative clinical applications. Today, Checkpoint stimulation is regarded as the standard of care for intraoperative nerve stimulation.

Beyond stimulation, Checkpoint Surgical continues to deliver solutions for the entire continuum of intraoperative nerve care — from nerve protection and assessment, to nerve preparation and repair, to nerve healing and restoration.

CHECKPOINT SURGICAL®

CHECKPOINT® Stimulators help surgeons unlock the information they need to assess and protect nerves during surgery to support intraoperative decision making. All Checkpoint Stimulators use a biphasic waveform that is safe for prolonged or repeated stimulation without diminished response.

CHECKPOINT GUARDIAN®

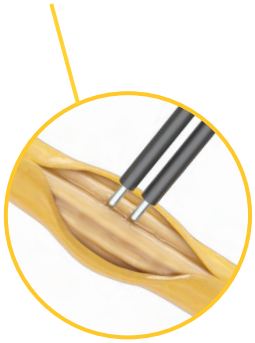
Nerve Stimulator

CHECKPOINT GUARDIAN® delivers safe stimulation for nerve location, assessment and intraoperative modeling. Enhanced information delivery supports intraoperative decision-making.

CHECKPOINT GEMINI®

Bipolar Nerve Stimulator

CHECKPOINT GEMINI® offers a bipolar stimulation probe for finely controlled stimulation even at the fascicular level.



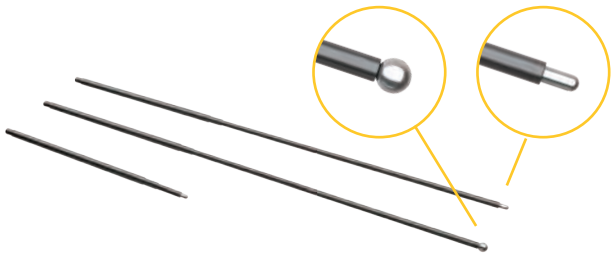
	Guardian	Gemini
Nerve Location	●	
Nerve Identification	●	●
Nerve Assessment	●	●
Direct Muscle Stim	●	
Fast Twitch Muscle		●
Area of Activation	BROAD	PRECISE
Intraneural Selectivity	GOOD	BEST
Stimulation Probe	MONOPOLAR	BIPOLAR
Current Return Needle	●	

Checkpoint® Stimulator Intraoperative Lead Accessory

The Checkpoint Intraoperative Lead Accessory allows for simple, hands-free same-site stimulation, making it easier to repeatedly assess motor nerve excitability throughout a procedure.

Checkpoint® Stimulator Probe Extension

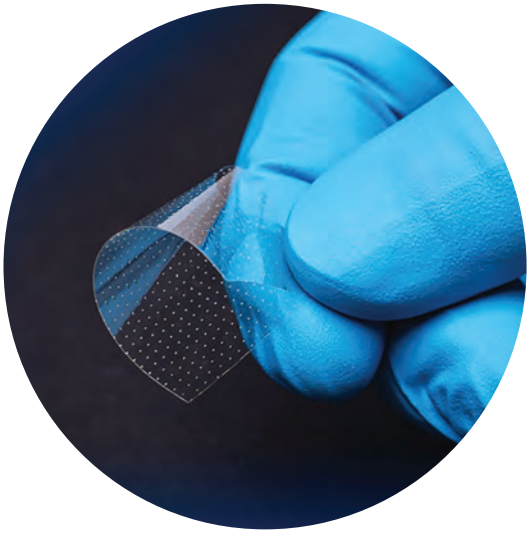
The Checkpoint Probe Extension allows surgeons to customize the Checkpoint Guardian and Checkpoint Head & Neck Stimulators by extending the length of the probe.

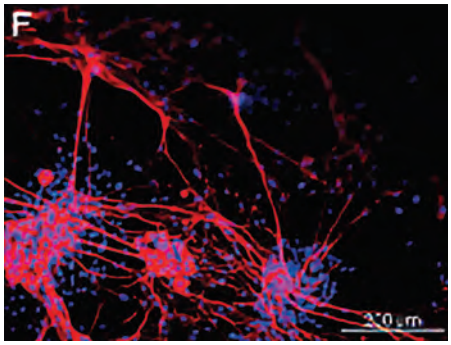


CHECKPOINT NEUROSHIELD™

Chitosan Membrane

CHECKPOINT NEUROSHIELD™ is a chitosan membrane indicated for the repair of peripheral nerve injuries. Chitosan, a polysaccharide, displays biocompatibility, biodegradability, low toxicity, and cellular compatibility, which can all be fine-tuned by the degree of acetylation.[1-3] NeuroShield undergoes a proprietary processing method, resulting in a low deacetylated chitosan membrane that has been optimized for nerve repair.





Preclinical, *in vitro* studies have shown Schwann cell viability, migration, and proliferation on chitosan membranes, particularly those with a low deacetylation.[1,4-6]

(Left) Immunofluorescence of rat primary dissociated dorsal root ganglia (DRGs) axonal outgrowth when seeded on plain chitosan films.[4]

WHY CHITOSAN FOR NERVE HEALING?

In preclinical studies, chitosan has shown these potential attributes for nerve healing.

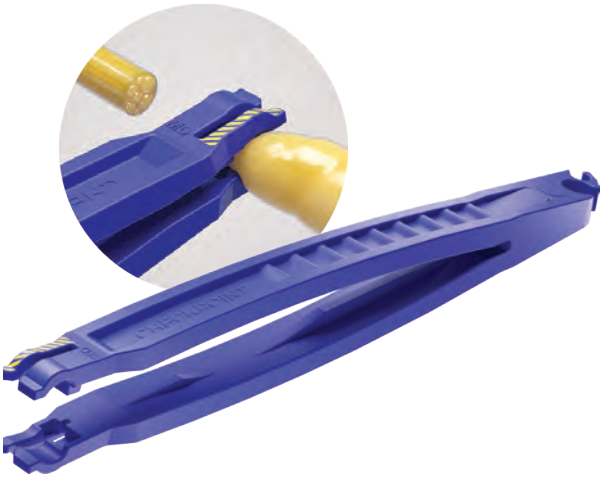
- **Supports an anti-inflammatory environment**[7,8]
- **Inhibits fibroblast proliferation and infiltration**[3]
- **Supports tissue healing**[6,10]
- **Has antimicrobial properties**[9]
- **Is biodegradable**[10,11]
- **Fully resorbs**[10,12]

1. Freier, Thomas et al. "Controlling cell adhesion and degradation of chitosan films by N-acetylation." Biomaterials vol. 26,29 (2005): 5872-8. **2.** Haastert-Talini, K. et al. Chitosan tubes of varying degrees of acetylation for bridging peripheral nerve efects. Biomaterials 34 (2013): 9886-9904. **3.** Chatelet, C et al. "Influence of the degree of acetylation on some biological properties of chitosan films." Biomaterials vol. 22,3 (2001): 261-8. **4.** Wrobel, Sandra et al. In vitro evaluation of cell-seeded chitosan films for peripheral nerve tissue engineering. Tissue engineering. Part vol. 20,17-18 (2014): 2339-49. **5.** Yuan, Ying et al. "The interaction of Schwann cells with chitosan membranes and fibers in vitro." Biomaterials vol. 25,18 (2004): 4273-8. **6.** Carvalho, Cristiana R et al. "Investigation of cell adhesion in chitosan membranes for peripheral nerve regeneration." Materials science & engineering. C, Materials for biological applications vol. 71 (2017): 1122-1134. **7.** Vasconcelos DP, Fonseca AC, Costa M, Amaral IF, Barbosa MA, Águas AP, Barbosa JN. Macrophage polarization following chitosan implantation. Biomaterials. 2013;34(38):9952-9959. **8.** Oliveira MI, Santos SG, Oliveira MJ, Torres AL, Barbosa MA. Chitosan drives anti-inflammatory macrophage polarisationand pro-inflammatory dendritic cell stimulation. EurCell Mater. 2012 Jul 24;24:136-52; discussion 152-3.

CHECKPOINT EDGE®

Nerve Cutting Kit

Traditional nerve cutting techniques may flatten and crush nerve tissue, leaving nerve ends misshapen and difficult to align. CHECKPOINT EDGE® employs circumferential constraint to maintain the nerve's natural shape during transection. Constraining the nerve in this manner can prevent nerve sliding, flattening and subsequent nerve edge malformation, helping to preserve fascicular group alignment and tissue integrity.[13,14]



The head design permits a secure, single-handed hold that both grasps the sacrificial nerve zone to allow tensioning and gently constrains the nerve to be preserved. The cutting slot facilitates a right-angle cut with the other hand. Surgeon control of placement, tension, and transection reduces variability, facilitating reliable, consistent nerve tissue preparation for aligned coaptation.

CHECKPOINT® HEAD & NECK

Nerve Stimulator/Locator

CHECKPOINT® HEAD & NECK provides visual or tactile confirmation of nerve function and location without the need for external monitoring equipment, protecting nerves even in obscured anatomy. For use in thyroidectomy, parotidectomy and neck dissection.

9. Ke CL, Deng FS, Chuang CY, Lin CH. Antimicrobial actions and applications of chitosan. Polymers (Basel). 2021 Mar 15;13(6):904. **10.** Matica A. Biodegradability of chitosan-based products. New Front Chem. 2017;26:75-86. **11.** Suyeon Kim, "Competitive Biological Activities of Chitosan and Its Derivatives: Antimicrobial, Antioxidant, Anticancer, and Anti-Iflammatory Activities", International Journal of Polymer Science, vol. 2018, Article ID 1708172, 13 pages, 2018. **12.** Wang Y, Zhao Y, Sun C, Hu W, 11. Zhao J, Li G, Zhang L, Liu M, Liu Y, Ding F, Yang Y, Gu. Chitosan Degradation Products Promote Nerve Regeneration by Stimulating Schwann Cell Proliferation via miR-27a/FOXO1 Axis. Mol Neurobiol. 2016 Jan;53(1):28-39. **13.** Smetana B, et al. Improving Nerve End Preparation for Neurorrhaphy through Use of a Circumferentially Constraining Surgical Device. Poster presented at 2018 ASPN Annual Meeting, January 12-14, 2018, Phoenix, AZ. **14.** Jernigan EW, Patterson JMM, Draeger RW. How to cut a nerve: morphological implications of instruments used in preparation of severed erves for neurorrhaphy. J Hand Surg Eur Vol. 2017 Nov;42(9):961-963.

ORDERING INFORMATION

ORDER CODE	DESCRIPTION	QUANTITY
CHECKPOINT GUARDIAN®		
9095	Checkpoint Guardian Nerve Stimulator	Pack of 4
CHECKPOINT GEMINI®		
9092	Checkpoint Gemini Bipolar Nerve Stimulator	Pack of 4
CHECKPOINT GUARDIAN® Intraoperative Lead Accessory		
9524	Intraoperative Lead, Small	Pack of 4
9525	Intraoperative Lead, Medium	Pack of 4
9526	Intraoperative Lead, Large	Pack of 4
CHECKPOINT® Stimulator Probe Extension		
9504	Probe Extension Assembly, 12 cm	Pack of 4
9505	Probe Extension Assembly, Ball Tip, 12 cm	Pack of 4
9506	Probe Extension Assembly, 4 cm	Pack of 4
CHECKPOINT NEUROSHIELD™		
NS3020	NeuroShield 30 x 20 mm	Single Unit
NS4030	NeuroShield 40 x 30 mm	Single Unit
CHECKPOINT EDGE®		
9250	Checkpoint Edge Nerve Cutting Kit	Pack of 4
Kit includes (3) forceps: SM (1-3 mm diameter), MD (3-5 mm diameter), LG (5-7 mm diameter), (1) microsurgical background, (1) SM69 scalpel blade, (1) 10R scalpel blade		
V0001	Scalpel Blade, Size 69 Micro	Pack of 25
V0002	Scalpel Blade, Size 10R	Pack of 100
V0003	Fine Stainless Handle (10 cm)	Single Unit
V0004	No. 3 Graduated Stainless Surgical Handle	Single Unit
CHECKPOINT® HEAD & NECK		
9394	Checkpoint Head & Neck Nerve Stimulator	Pack of 4

INDICATIONS FOR USE

The CHECKPOINT® Stimulator is a single-use, sterile device intended to provide electrical stimulation of exposed motor nerves or muscle tissue to locate and identify nerves and to test nerve and muscle excitability. Do not use this Stimulator when paralyzing anesthetic agents are in effect, as an absent or inconsistent response to stimulation may result in inaccurate assessment of nerve and muscle function.

The CHECKPOINT EDGE™ Nerve Cutting Kit is a single-use, sterile kit intended to provide surgeon aid in transecting nerve tissue for the purpose of nerve graft preparation, nerve repair, or removal of exposed nerve.

CHECKPOINT NEUROSHIELD™ is indicated for the repair of peripheral nerve injuries in which there is no gap or where a gap closure can be achieved by flexion of the extremity. NeuroShield nerve membranes are designed exclusively for single use. Allergic reactions to implanted products containing chitosan are not yet known. However, since chitosan is derived from shellfish, individuals with known shellfish allergies should exercise caution in the use of any product containing chitosan. As with all procedures carried out on peripheral nerves, there is a risk of the nerve not regenerating.

Please see Instructions for Use for complete product specifications, indications, contraindications, precautions, and warnings.

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