Nerve repair, made SMRT™

Remplir is engineered with Orthocell's proprietary SMRT™ technology to help patients reclaim touch, movement, and their lives.[1,2]

ortho·cell

Remplir™

Peripheral nerve repair:
A smarter way to support nerve healing

The best predictor of success in peripheral nerve surgery is a tension-free, well-aligned coaptation using minimal epineurial microsutures to optimise axonal regeneration.[3]

Yet depending on the type and location of the repair, achieving this can be challenging and outcome predictability has changed little over the past decades.[3-5]

Biomaterial choice may play a larger role than previously thought.

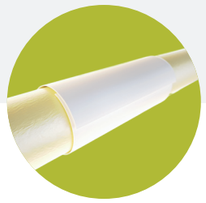
Many materials fail to fully integrate with native tissue, leaving residues that impede healing. Rigid materials can also be difficult to handle and complicate management of size mismatches.[6,7]

Remplir is engineered with Orthocell's proprietary SMRT™ technology to:

- mimic the natural epineurium with an absolute collagen wrap[1]
- create an optimal healing environment for nerve regeneration[1,2]
- be easy to handle and suture-sparing, simplifying the surgical process[1,2]
- protect the repair site from scarring, adhesions, and inflammation.[1]

Repair with Remplir:
One wrap, multiple applications

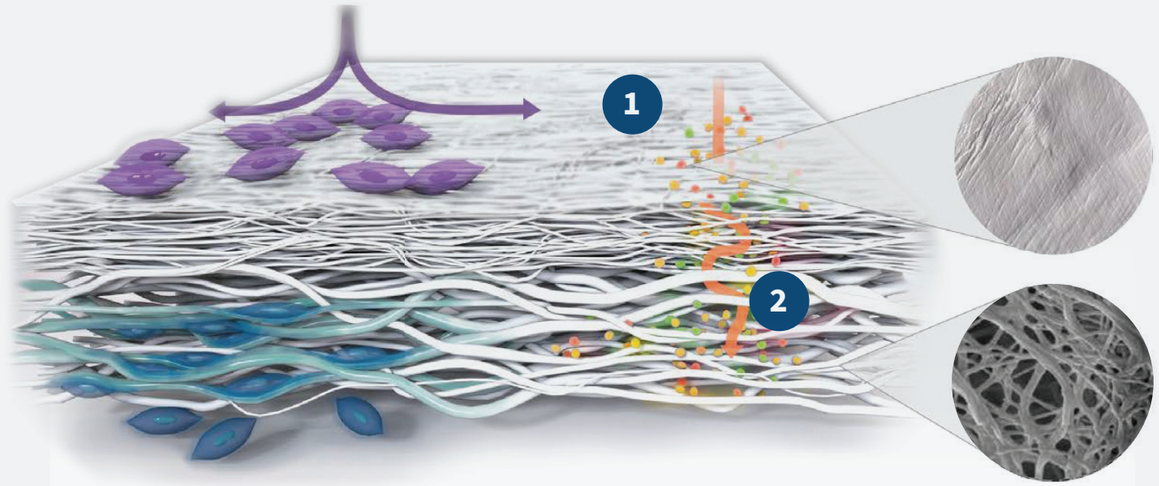
Connect
Enables tensionless repair of transected nerve injuries, supporting direct repairs with or without grafts, as well as nerve transfers and free functioning muscle transfers.[1,2]



Protect
Helps manage non-transected nerve injuries by reducing the risk of adhesion formation and supporting smooth nerve gliding in conditions such as carpal and cubital tunnel syndrome.[1]

Cap
Prevents neuroma regrowth after resection of a terminal neuroma, or formation of new neuromas post amputation.[1]

Protects, integrates and provides a template for restoration of native epineurium



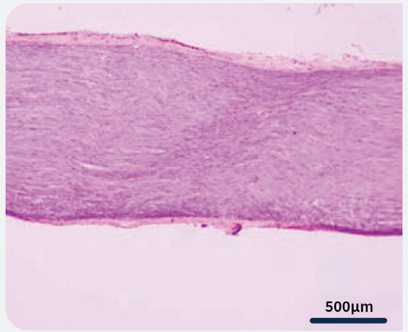
Benefits of naturally occurring collagen structure

1 Smooth outer surface
- Densely packed collagen bundles
- Cell occlusive surface minimises the risk of adhesions and facilitates nerve gliding[1]
- Permits passage of fluids and nutrients while retaining neurotrophic factors.[1]

2 Rough inner surface
- Loosely distributed collagen bundles
- Creates favourable microenvironment for nerve healing.[1,2]

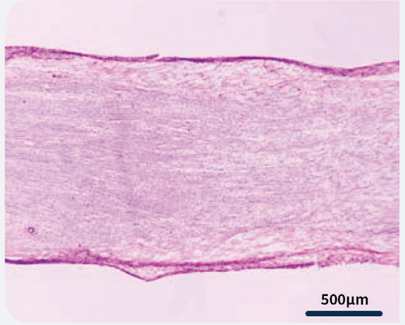
Remplir pre-clinical evidence[8]

Remplir-assisted repair: restored nerve structure



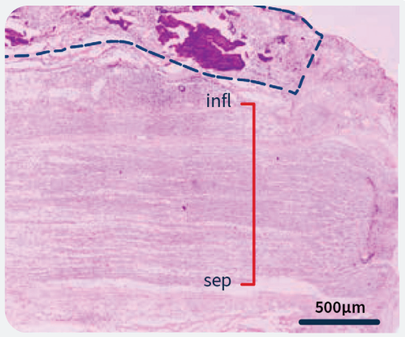
Intact rat sciatic nerve

- Longitudinally-aligned nerve fibres surrounded by protective outer layer of epineurium



Remplir-wrapped rat sciatic nerve

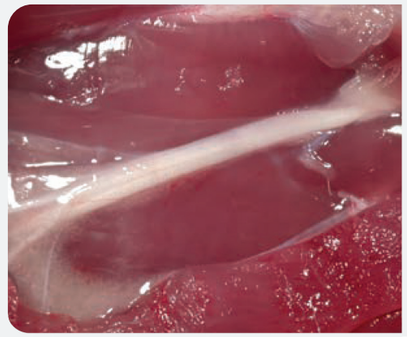
- Restoration of nerve fibre structure
- Epineurium-like tissue is restored as Remplir is resorbed
- No scar tissue, inflammation or foreign body reaction observed
- No compression of nerve



Comparator-wrapped rat sciatic nerve

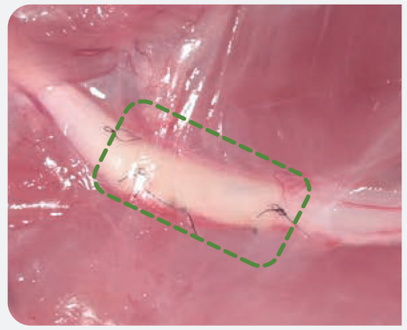
- Abnormal nerve structure encapsulated in thick, inflamed fibrous tissue *(blue)*
- Inflammation and foreign body reaction observed
- Compression of nerve fibres with nerve entrapment *(red)* and separation of epineurium from nerve.

Facilitates gliding and minimises adhesion



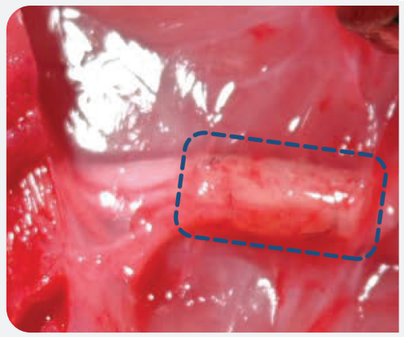
Intact rat sciatic nerve

- Pearly white appearance
- Moves freely within surrounding soft tissue



Remplir-wrapped rat sciatic nerve

- Integrated into nerve tissue with appearance resembling pre-injured state *(green)*
- No evidence of inflammation
- Minimal adhesions or scar tissue formation

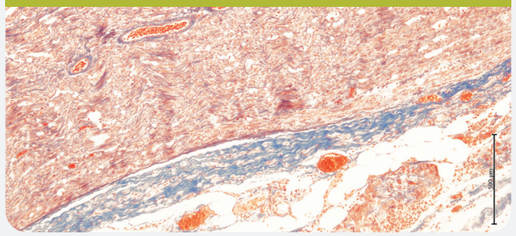


Comparator-wrapped rat sciatic nerve

- Not integrated with nerve tissue *(blue)*
- Multiple points of adhesion to surrounding tissue
- Inflammatory reaction observed

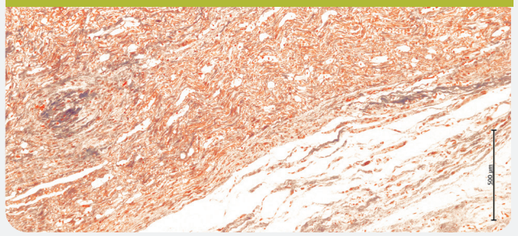
Benefits of augmenting suture repair with Remplir

Suture repair with Remplir



Remplir forms a protective, epineurial-like barrier around the repaired nerve, with no inflammatory response observed. Vascularisation occurs both external to Remplir and within the nerve. Formation of adipose and connective tissue external to Remplir cushions the nerve and allows nerve gliding.

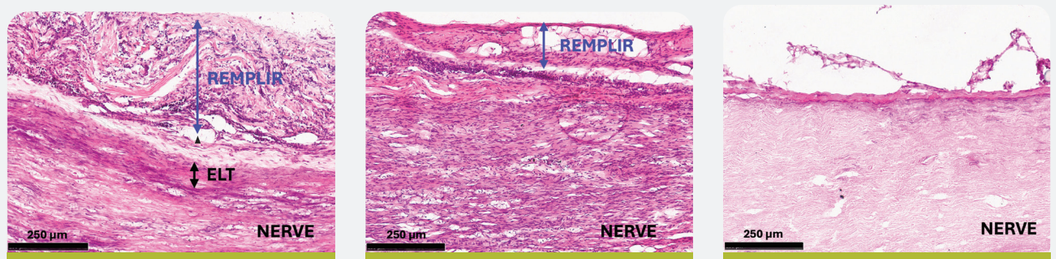
Suture repair without Remplir



No regeneration of protective epineurium or induction of adipose or connective tissue was observed after suture repair without Remplir, increasing the risk of adhesions and nerve compression.

Integration and restoration of nerve tissue

Early integration of Remplir, crucial for maintaining the structural integrity of the repaired nerve during early healing, was observed after 4 weeks.



4 weeks	12 weeks	24 weeks
Early integration of Remplir and formation of epineurium-like tissue (ELT)	Remplir largely resorbed, and ELT is becoming restored	Remplir completely resorbed and ELT is restored

As Remplir degrades over 24 weeks, the nerve is increasingly protected by epineurium-like tissue. Physiological inflammation (indicated by dark purple cellular staining) is the normal healing process observed across the observation period. No foreign body response was observed.

A complete range of nerve wraps

	15x20mm	20x30mm	30x40mm	40x50mm
Nerve diameter	Up to 3mm	Up to 5mm	Up to 10mm	Used for longitudinal wrapping
Note: Smooth side away from nerve				
Order codes	ON-152	ON-203	ON-304	ON-405

Remplir™ | **Nerve repair, made SMRT™**

About us

Orthocell Ltd, headquartered in Perth, Australia, is the home of Remplir

Since 2010, we've been developing and exporting innovative regenerative medicine products worldwide. To date, more than 70,000 patients have benefited from an Orthocell collagen medical device, with no reported adverse events as of March 2025. Every product reflects our mission: improving mobility, function, and quality of life. We collaborate with leading surgeons and centres of excellence to translate research into practical solutions that raise the standard of care. Our deep understanding of tissue engineering, particularly the interaction between cells and scaffolds, allows us to enhance the body's natural healing and regeneration processes. Orthocell products are designed to simplify procedures, save operative time, and deliver consistent, predictable outcomes, supporting surgeons in providing the best care for their patients.

References. 1. Data on file. **2.** O'Beirne, A., J. Cullen, E. Landao-Bassonga, M. Zheng, C. Lee, P. Kaluskar, A. Tai and M. Zheng (2024). "Reconstruction of Upper Extremity Peripheral Nerve Injuries Using an Epineurial-Like Collagen Device—A Prospective Clinical Study." Journal of Reconstructive Microsurgery Open 09(01): e78-e88. **3.** Siemionow, M. and G. Brzezicki (2009). "Chapter 8: Current techniques and concepts in peripheral nerve repair." Int Rev Neurobiol 87: 141-172. **4.** Ruijs, A.C., J.B. Jaquet, S. Kalmijn, H. Giele, S.E. Hovius (2005). "Median and ulnar nerve injuries: a meta-analysis of predictors of motor and sensory recovery after modern microsurgical nerve repair." Plast Reconstr Surg 116(2):484-94 **5.** Braga Silva, J., G. M. Marchese, C. G. Cauduro and M. Debiasi (2017). "Nerve conduits for treating peripheral nerve injuries: A systematic literature review." Hand Surg Rehabil 36(2): 71-85. **6.** Aman M, Preisner F, Mayrhofer-Schmid M, et al. Inferior Long-Term Results of a Randomized Controlled Trial Initially Demonstrating Enhanced Sensory Nerve Recovery Using a Chitosan Nerve Tube. Plast Reconstr Surg. 2025;155(2):364-373. Doi:10.1097/PRS.0000000000011526 **7.** Zeng W, Osterman M, Stern PJ. Inflammatory Reactions to Xenogenic Nerve Wraps: A Report of Three Cases. JBJS Case Connect. 2019;9(3):e0302. Doi:10.2106/JBJS.CC.18.00302 **8.** Data on file, 4 weeks post-transection.

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