For larger defects, autologous nerve grafts provide the only proven practical method of restoring nerve continuity. Nerve grafting essentially involves taking a donor nerve from another part of the patient's anatomy and using it to bridge the gap in the injured nerve.

Autologous nerve grafting remains a gold standard for bridging an extended gap in transected nerves. The formidable limitations related to this approach, however, have evoked the development of tissue-engineered nerve grafts as a promising alternative to autologous nerve grafts. A tissue-engineered nerve graft is typically constructed through a combination of a neural scaffold and a variety of cellular and molecular components. The initial and basic structure of the neural scaffold that serves to provide mechanical guidance and an optimal environment for nerve regeneration was a single hollow nerve guidance conduit. Later there have been several improvements to the basic structure, especially the introduction of physical fillers into the lumen of a hollow nerve guidance conduit. Up to now, a diverse array of biomaterials, either of natural or of synthetic origin, together with well-defined fabrication techniques, has been employed to prepare neural scaffolds with different structures and properties. Meanwhile different types of support cells and/or growth factors have been incorporated into the neural scaffold, producing unique biochemical effects on nerve regeneration and function restoration [1].

1)
Gu X, Ding F, Yang Y, Liu J. Construction of tissue-engineered nerve grafts and their application in peripheral nerve regeneration. Prog Neurobiol. 2011 Feb;93(2):204-30. doi: 10.1016/j.pneurobio.2010.11.002. Epub 2010 Dec 2. PMID: 21130136.