

Breast cancer patients are increasingly seeking breast reconstruction that restores not only breast shape but also sensory function. Various neurotization techniques have been explored to reestablish breast and nipple sensation, yielding promising outcomes. However, optimal approaches remain undefined.

A scoping review of PubMed and EMBASE was conducted, focusing on studies of breast neurotization in both autologous and implant-based reconstructions. The use of quantitative tools enables objective assessment of breast sensation across these various reconstruction types. Neurotization of autologous flaps improves recovery of protective and erogenous sensation and enhances physical well-being without significantly increasing surgical risk. Furthermore, neurotization on implant-based breast reconstruction using nerve grafts has shown promising sensory outcomes. Autografts support consistent nerve regeneration but are technically demanding; allografts simplify surgery and reduce morbidity but are currently costly and require further study. While preclinical data favor superficial neurotization, both superficial and deep approaches produce good clinical outcomes. Neurotization significantly improves postoperative sensation and patient-reported outcomes.

Future research should focus on optimizing technique selection and validating long-term benefits. Standardized prospective studies are needed to understand the effectiveness of different approaches better. Specifically, further investigation is necessary into the potential for techniques such as double fascicles and vascularized stumps to fasten the recovery process. This will help to establish the best practices for improving patient outcomes in breast reconstruction. Also, some animal models can be created to help elucidate details of reinnervation.