

**Subject:** Nerve Graft after Prostatectomy**Document #:** SURG.00076**Status:** Reviewed**Publish Date:** 06/28/2023**Last Review Date:** 05/11/2023

## Description/Scope

This document addresses nerve grafting after unilateral or bilateral resection of the neurovascular bundles as a part of a radical prostatectomy.

## Position Statement

### Investigational and Not Medically Necessary:

Nerve grafting is considered **investigational and not medically necessary** after unilateral or bilateral resection of the neurovascular bundles as part of a radical prostatectomy.

## Rationale

Erectile dysfunction is a common problem after radical prostatectomy. Spontaneous erections are usually absent in individuals whose prostate cancer requires bilateral resection of the neurovascular bundles as part of the radical prostatectomy procedure. The sural nerve is considered expendable and has been used extensively in other nerve grafting procedures, such as brachial plexus and peripheral nerve injuries. When used in conjunction with a prostatectomy, a portion of the sural nerve is harvested from one leg and then anastomosed to the divided ends of the cavernous nerve. Other nerves such as the genitofemoral and ilioinguinal have also been considered for nerve grafting at the time of prostatectomy.

One randomized controlled trial (RCT) evaluating radical prostatectomy with and without nerve grafting was identified. Davis and colleagues (2009) reported on a phase II randomized trial comparing unilateral nerve-sparing radical prostatectomy with sural nerve graft versus unilateral nerve-sparing radical prostatectomy without sural nerve graft. The investigators hypothesized that individuals receiving the sural nerve graft along with the unilateral nerve-sparing radical prostatectomy would have a 50% increase in potency rate at 2 years compared to unilateral nerve-sparing radical prostatectomy alone. A total of 66 individuals were randomized to receive the sural nerve grafting versus 41 individuals serving as the control group (did not receive sural nerve grafting). Of the 66 individuals assigned to the protocol group 45 individuals made it to the 2-year endpoint analysis. Potency was achieved in 32 of 45 (71%) of those receiving the sural nerve graft and 14 of 21 (67%) of those in the control group. However, with an attrition of 19 individuals, the authors also reported an intention-to-treat analysis where potency was achieved in 32 of 66 (48.5%) individuals receiving a sural graft and 14 of 41 (34%) of those in the control group. In this study, the addition of a unilateral sural nerve graft to unilateral nerve-sparing radical prostatectomy did not produce a 50% relative improvement in potency at 2 years.

Sim and colleagues (2006) reported 2-year outcomes in 41 individuals who had a unilateral nerve-sparing radical prostatectomy and contralateral sural nerve grafting. Sixty-three percent (24 of 38) of individuals had recovery of erectile function with or without phosphodiesterase type 5 inhibitor. The authors reported 2-year outcomes on a second group of individuals who had unilateral resection at the same institution but without a nerve graft. In this second group, the erectile function with or without phosphodiesterase type 5 inhibitor was 26.5% (13 of 49). The study lacked a randomized control group and the effect of medical therapy was not controlled. The group without nerve grafting was older and less sexually active prior to surgery.

Nelson and colleagues (2006) reported on results using genitofemoral nerve grafts in 27 individuals (5 with bilateral grafts) with radical prostatectomy. At a mean follow-up of 14 months, 56% of individuals reported erectile function sufficient for penetration. The authors noted uncertainty about whether their findings were a consequence of an effective unilateral nerve-sparing dissection or of the nerve grafting.

Saito and colleagues (2007) reported 18-month results for three groups of individuals who underwent radical prostatectomy. The first group (n=12) received a unilateral interposition sural nerve graft, the second group (n=21) underwent bilateral nerve sparing without grafting, and the third group (n=31) underwent unilateral nerve sparing without grafting. Sexual function, evaluated by a self-administered questionnaire using the University of California Los Angeles (UCLA)-Prostate Cancer Index, was compared among the three groups. The postoperative sexual function (SXF) score of the unilateral interposition sural nerve graft group showed an intermediate level of recovery between those of the bilateral nerve sparing without grafting and unilateral nerve sparing without grafting groups at 12 months, and reached the same level as the score at 12 months of the bilateral nerve sparing without grafting group at 18 months postoperatively. However, background factors, such as the baseline SXF score, the usage rate of phosphodiesterase 5 inhibitors, and the rate of comorbidities were different between the unilateral interposition sural nerve graft and unilateral nerve sparing without grafting groups which makes it difficult to attribute the better recovery of the SXF score to the nerve graft. Furthermore, the sample sizes were small and the study lacked randomization.

Namiki and colleagues (2007) reported the results of unilateral sural nerve graft on recovery of sexual and urological function. Three groups of individuals were compared: 19 individuals with unilateral nerve sparing plus sural nerve graft, 60 individuals with unilateral nerve sparing but no grafting, and 34 individuals with bilateral nerve sparing surgery. Urinary continence and potency were estimated by the UCLA Prostate Cancer Index questionnaire. At 3 years, 25 and 28% of individuals in the nerve grafted group and the bilateral nerve sparing group respectively considered their sexual function as fair or good. Urinary function returned to baseline in the nerve grafted and bilateral nerve sparing groups at 6 months and in the unilateral nerve sparing group at 12 months. Differences in sexual function were present at baseline with the nerve grafted and bilateral nerve sparing individuals reporting higher baseline function than the unilateral nerve-sparing group. This study has limitations, which may bias the study outcomes. These limitations include lack of randomization, participant selection bias, and non-uniform use of erectile aids.

Secin and colleagues (2007) report the results of 44 individuals who underwent bilateral nerve grafting (sural, n=21; genitofemoral, n=21; ilioinguinal n=1) from 1999 to 2004. The overall 5-year recovery of erectile function was 34% and the rate of consistent function was 11%. None of a number of variables (for example, age, type of nerve [sural, genitofemoral, ilioinguinal], comorbidities, etc.) was significantly associated with recovery of postoperative erectile function.

Joffe and Klotz (2007) reported on a case series of 29 individuals who underwent unilateral nerve sparing radical prostatectomy with

contralateral genitofemoral nerve interposition. Twenty-two of the 29 individuals completed a questionnaire (response rate of 75.9%), and 7 (32%) of the 22 surveyed individuals were able to achieve unassisted erections.

Zorn and colleagues (2008) reported the outcomes of 27 individuals status post (23 unilateral, 4 bilateral) sural nerve grafts compared to non-grafted individuals. At 1 year, continence rates were not different for the grafted and non-grafted but nerve(s) spared groups. Sexual function was defined using validated questionnaires, and 24 of 27 nerve-grafted individuals were potent preoperatively. No differences between unilateral nerve graft and unilateral nerve sparing with no grafting were noted with respect to return to baseline sexual function. At mean follow-up of 26 months, 47.8% of unilaterally grafted individuals had regained potency, compared to 56% for age matched unilateral nerve sparing with no grafting. This study is limited by its retrospective, nonrandomized design and small sample size.

Hanson and colleagues (2008) reported on a nonrandomized, uncontrolled series of 40 individuals who underwent an open radical retropubic prostatectomy with unilateral neurovascular bundle resection and unilateral cavernosal nerve replacement. Seventy-two percent of the individuals were able to achieve intercourse at the median follow-up period of 28.7 months with a majority of individuals dependent on a phosphodiesterase type 5 inhibitor. The authors noted that there were several limitations to this study as the protocol was not randomized and there was an inability to distinguish sexual function due to nerve grafting versus clinical outcome due to participant selection.

In a prospective study by Siddiqui and colleagues (2014), the 3-year outcomes of recovery of erectile function were reported on 66 men who had sural nerve grafting during radical retropubic prostatectomy. Using an International Index of Erectile Function (IIEF) preoperative score of greater than 20 and greater than 22 postoperatively to define recovery of potency, the authors noted that 19 men (28.8%) postoperatively had an IIEF score greater than 22. The mean preoperative IIEF score was  $23.4 \pm 1.6$  with a mean follow-up of 35 months. This study is limited in its nonrandomized nature and lack of a control group.

The National Comprehensive Cancer Network (NCCN, V1.2023) Clinical Practice Guidelines in Oncology for prostate cancer concludes that there is no shown benefit to replace resected nerves with nerve grafts.

While studies demonstrate unilateral or bilateral nerve grafting may be feasible, whether or not this technique results in improved outcomes following radical prostatectomy has not been demonstrated and requires further study. Well-designed RCTs with long-term follow up are needed to establish the role of nerve grafting in treating erectile dysfunction after radical prostatectomy.

## Background/Overview

Erections are controlled by two bundles of nerves that run on either side of the prostate. During prostatectomy, these nerves may need to be removed. If both nerves are removed, spontaneous erections won't be possible, but erections may still be possible using noninvasive treatments such as vacuum constriction devices and intracavernosal injections. Nerve grafting to replace the nerves resected at the time of prostatectomy is under study.

## Definitions

Prostatectomy: The surgical removal of the prostate gland.

## Coding

*The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.*

### When Services are Investigational and Not Medically Necessary:

When the code describes a procedure indicated in the Position Statement section as investigational and not medically necessary.

#### CPT

64999	Unlisted procedure, nervous system [specified as nerve grafting to cavernous nerve]
-------	---

#### ICD-10 Procedure

01S90ZZ	Reposition lumbar plexus, open approach [genitofemoral, ilioinguinal nerve]
01SG0ZZ	Reposition tibial nerve, open approach [sural nerve]

#### ICD-10 Diagnosis

C61	Malignant neoplasm of prostate
D07.5	Carcinoma in situ of prostate
N52.31	Erectile dysfunction following radical prostatectomy
N52.34	Erectile dysfunction following simple prostatectomy

## References

### Peer Reviewed Publications:

1. Davis JW, Chang DW, Chevray P, et al. Randomized phase II trial evaluation of erectile function after attempted unilateral cavernous nerve-sparing retropubic radical prostatectomy with versus without unilateral sural nerve grafting for clinically localized prostate cancer. *Eur Urol.* 2009; 55(5):1135-1143.
2. Hanson GR, Borden LS Jr, Backous DD, et al. Erectile function following unilateral cavernosal nerve replacement. *Can J Urol.* 2008; 15(2):3990-3993.
3. Joffe R, Klotz LH. Results of unilateral genitofemoral nerve grafts with contralateral nerve sparing during radical prostatectomy. *Urology.* 2007; 69(6):1161-1164.
4. Namiki S, Saito S, Nakagawa H, et al. Impact of unilateral sural nerve graft on recovery of potency and continence following radical prostatectomy: 3-year longitudinal study. *J Urol.* 2007; 178(1):212-216.
5. Nelson BA, Chang SS, Cook son MS, Smith JA Jr. Morbidity and efficacy of genitofemoral nerve grafts with radical retropubic prostatectomy. *Urology.* 2006; 67(4):789-792.
6. Saito S, Namiki S, Numahata K, et al. Impact of unilateral interposition sural nerve graft on the recovery of sexual function after radical prostatectomy in Japanese men: a preliminary study. *Int J Urol.* 2007; 14(2):133-139.

7. Secin FP, Koppie TM, Scardino PT, et al. Bilateral cavernous nerve interposition grafting during radical retropubic prostatectomy: Memorial Sloan-Kettering Cancer Center experience. J Urol. 2007; 177(2):664-668.
8. Siddiqui KM, Billia M, Mazzola CR, et al. Three-year outcomes of recovery of erectile function after open radical prostatectomy with sural nerve grafting. J Sex Med. 2014; 11(8):2119-2124.
9. Sim HG, Klot M, Lange PH, et al. Two-year outcome of unilateral sural nerve interposition graft after radical prostatectomy. Urology. 2006; 68(6):1290-1294.
10. Zorn KC, Bernstein AJ, Gofrit ON, et al. Long-term functional and oncological outcomes of patients undergoing sural nerve interposition grafting during robot-assisted laparoscopic radical prostatectomy. J Endourol. 2008; 22(5):1-8.

#### Government Agency, Medical Society, and Other Authoritative Publications:

1. NCCN Clinical Practice Guidelines in Oncology™ (NCCN). © 2023 National Comprehensive Cancer Network, Inc. For additional information visit the NCCN website: <http://www.nccn.org/index.asp>. Accessed on April 03, 2023.
  - Prostate Cancer (V1.2023). Revised September 16, 2022.

## Index

Nerve Graft  
Prostatectomy

## Document History

Status	Date	Action		
Reviewed	05/11/2023	Medical Policy & Technology Assessment Committee (MPTAC) review. Updated Rationale and References sections.		
Reviewed	05/12/2022	MPTAC review. The Rationale and References sections were updated.		
Reviewed	05/13/2021	MPTAC review. The Rationale and References sections were updated.		
Reviewed	05/14/2020	MPTAC review. Updated References section.		
Reviewed	06/06/2019	MPTAC review. Updated Rationale and References sections.		
Reviewed	07/26/2018	MPTAC review. The document header wording updated from “Current Effective Date” to “Publish Date.” Updated Rationale, Background/Overview and References sections.		
Reviewed	08/03/2017	MPTAC review. Updated Background/Overview, Rationale, References, and Index sections.		
Reviewed	08/04/2016	MPTAC review. Updated Rationale and Reference Sections. Removed ICD-9 codes from Coding section.		
Reviewed	08/06/2015	MPTAC review. Updated Description/Scope, Rationale and Reference sections.		
Reviewed	08/14/2014	MPTAC review. Updated Rationale and References sections.		
Reviewed	08/08/2013	MPTAC review. Updated Rationale and References.		
Reviewed	08/09/2012	MPTAC review. Updated Rationale and References.		
Reviewed	08/18/2011	MPTAC review. Updated Rationale and References.		
Reviewed	08/19/2010	MPTAC review. Updated Rationale and References.		
Reviewed	08/27/2009	MPTAC review. No change to Position Statement. Reference section updated.		
Reviewed	08/28/2008	MPTAC review. Rationale and References updated.		
	02/21/2008	The phrase “investigational/not medically necessary” was clarified to read “investigational and not medically necessary.” This change was approved at the November 29, 2007 MPTAC meeting.		
Revised	08/23/2007	MPTAC review. Position Statement updated to include all nerve grafting. Title updated from Sural Nerve Graft after Prostatectomy to Nerve Graft after Prostatectomy.		
Reviewed	09/14/2006	MPTAC review. Rationale and References updated. No change in Position Statement.		
Revised	09/22/2005	MPTAC review. Revision based on Pre-merger Anthem and Pre-merger WellPoint Harmonization.		
Pre-Merger Organizations		Last Review Date	Document Number	Title
Anthem, Inc.			No prior document	
WellPoint Health Networks, Inc.		6/24/2004	3.08.04	Sural Nerve Graft After Prostatectomy

Applicable to Commercial HMO members in California: When a medical policy states a procedure or treatment is investigational, PMGs should not approve or deny the request. Instead, please fax the request to Anthem Blue Cross Grievance and Appeals at fax # 818-234-2767 or 818-234-3824. For questions, call G&A at 1-800-365-0609 and ask to speak with the Investigational Review Nurse.

Federal and State law, as well as contract language, including definitions and specific contract provisions/exclusions, take precedence over Medical Policy and must be considered first in determining eligibility for coverage. The member's contract benefits in effect on the date that services are rendered must be used. Medical Policy, which addresses medical efficacy, should be considered before utilizing medical opinion in adjudication. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from the health plan.