NERVE GRAFT TO RESTORE ERECTILE FUNCTION DURING RADICAL PROSTATECTOMY

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INSTRUCTIONS FOR USE

This Medical Policy provides assistance in interpreting UnitedHealthcare benefit plans. When deciding coverage, the member specific benefit plan document must be referenced. The terms of the member specific benefit plan document [e.g., Certificate of Coverage (COC), Schedule of Benefits (SOB), and/or Summary Plan Description (SPD)] may differ greatly from the standard benefit plan upon which this Medical Policy is based. In the event of a conflict, the member specific benefit plan document supersedes this Medical Policy. All reviewers must first identify member eligibility, any federal or state regulatory requirements, and the member specific benefit plan coverage prior to use of this Medical Policy. Other Policies and Coverage Determination Guidelines may apply. UnitedHealthcare reserves the right, in its sole discretion, to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

UnitedHealthcare may also use tools developed by third parties, such as the MCG™ Care Guidelines, to assist us in administering health benefits. The MCG™ Care Guidelines are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice.

BENEFIT CONSIDERATIONS

Before using this policy, please check the member specific benefit plan document and any federal or state mandates, if applicable.

Essential Health Benefits for Individual and Small Group

For plan years beginning on or after January 1, 2014, the Affordable Care Act of 2010 (ACA) requires fully insured non-grandfathered individual and small group plans (inside and outside of Exchanges) to provide coverage for ten categories of Essential Health Benefits ("EHBs"). Large group plans (both self-funded and fully insured), and small group ASO plans, are not subject to the requirement to offer coverage for EHBs. However, if such plans choose to provide coverage for benefits which are deemed EHBs, the ACA requires all dollar limits on those benefits to be removed on all Grandfathered and Non-Grandfathered plans. The determination of which benefits constitute EHBs is made on a state by state basis. As such, when using this policy, it is important to refer to the member specific benefit plan document to determine benefit coverage.

COVERAGE RATIONALE

Sural or other nerve grafts to restore erectile function during radical prostatectomy are unproven and not medically necessary.

No comparative studies between nerve grafts and standard medical therapy (e.g., intracorporal injection, or vacuum erection devices have been completed. The evidence for nerve grafts for restoration of erectile function is derived...
mainly from non-randomized studies limited by small sample sizes. A randomized controlled trial was discontinued when it was determined that unilateral nerve-sparing radical prostatectomy was not effective.

**APPLICABLE CODES**

The following list of procedure codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Coverage Determination Guidelines may apply.

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
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<tr>
<td>55899</td>
<td>Unlisted procedure, male genital system</td>
</tr>
<tr>
<td>64999</td>
<td>Unlisted procedure, nervous system</td>
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**DESCRIPTION OF SERVICES**

Erectile dysfunction is a common problem after radical prostatectomy. In particular, spontaneous erections are absent in patients who have bilateral resection of the neurovascular bundles as part of the radical prostatectomy procedure for treatment of localized prostate cancer. A technique called nerve-sparing surgery has been developed to prevent damage to these nerves; however, this technique is not possible in some patients.

Nerve grafting to replace resected cavernous nerves during radical retropubic prostatectomy has been proposed as a technique to increase the likelihood of restoring spontaneous erectile function. During the procedure, a donor nerve (e.g., sural nerve, genitofemoral nerve) is harvested from the patient and joined to the distal and proximal ends of the resected cavernous nerve. Granting may be performed on one or both resected cavernous nerves. The sural nerve (a nerve traveling along the short saphenous vein in the lower leg) is the most common donor nerve used in the nerve grafting procedure during radical prostatectomy. The nerve is considered expendable and has been used commonly in other nerve grafting procedures for repairing injured peripheral nerves. During the sural nerve grafting procedure, a portion of the nerve is harvested from one leg of the patient and grafted to the resected cavernous nerve.

Advocates of nerve grafting believe that nerves should be preserved whenever compatible with complete resection of cancer, but that when the cavernous nerve must be resected or is damaged severely, graft replacement should be a consideration (Kim et al., 2001; Scardino et al., 2001). While the decision to spare or resect the neurovascular bundles is based on the surgeon's preference, it is influenced by clinical stage, prostate-specific antigen level, and transrectal ultrasound/biopsy results (Kim et al., 2001).

**CLINICAL EVIDENCE**

Kung et al. (2015) performed a retrospective study on 38 consecutive patients who underwent immediate unilateral or bilateral nerve reconstruction after open prostatectomy. Additionally, 53 control patients who underwent unilateral, bilateral, or non-nerve-sparing open prostatectomy without nerve grafting were reviewed. Outcomes included rates of urinary continence, erections sufficient for sexual intercourse, and ability to have spontaneous erections. Analysis was performed by stratifying patients by D'Amico score and laterality of nerve involvement. There was no significant benefit for patients who had unilateral nerve grafting versus unilateral nerve-sparing prostatectomy. Bilateral nerve-sparing patients demonstrated superior functional outcomes compared with bilateral non-nerve-sparing patients, whereas bilateral nerve-grafting patients displayed a trend toward functional improvement. With increasing D'Amico score, there was a trend toward worsening urinary continence and erectile function regardless of nerve-grafting status. The authors concluded that immediate nerve grafting for reconstruction of the prostatic plexus after radical prostatectomy may be most valuable for improving postoperative morbidity in patients requiring bilateral neurovascular bundle resections. Currently, the benefit of nerve grafting is limited by the inability to accurately isolate the putative nerves, which mediate erectile function and urinary continence. Further investigation is needed to improve the potential of bilateral nerve grafting after non-nerve-sparing prostatectomy. Limitations to this study include small sample size and the subjective nature of the postoperative outcomes.

Siddiqui et al. (2014) examined the long term outcome of sural nerve grafting (SNG) during radical retropubic prostatectomy (RRP) performed by a single surgeon. Sixty six patients with clinically localized prostate cancer and preoperative International Index of Erectile Function (IIEF) score >20 who underwent RRP were included. Neurovascular bundle (NVB) excision was performed if the risk of side-specific extra-capsular extension (ECE) was >25% on Ohori’s nomogram. SNG was harvested by a plastic surgeon, contemporaneously as the urologic surgeon was performing RRP. IIEF questionnaire was used pre- and postoperatively and at follow-up (3 years). Recovery of potency was defined as postoperative IIEF-EF domain score >22. There were 43 (65%) unilateral SNGs and 23 (35%)
bilateral SNGs. The mean preoperative IIEF score was 23.4+1.6. Long term assessment reflected 19 patients (28.8%) had IIEF scores >22. The IIEF-EF scores for those who had unilateral SNG and bilateral SNG were 12.9+4.9 and 14.8+5.3 respectively. The authors concluded that SNG can potentially improve EF recovery for potent men with higher stage prostate cancer undergoing RP; and that the contemporaneous, multidisciplinary approach provides a good quality graft while expediting-the procedure without interrupting the work-flow. However, the evidence is insufficient to conclude that this surgical technique is equivalent to bilateral nerve sparing prostatectomy or that long-term outcomes are improved by nerve grafting.

Davis et al. (2009) wanted to evaluate whether unilateral nerve-sparing (UNS) radical prostatectomy (RP) plus sural nerve grafting (SNG) would result in 50% relative improvement in potency at 2 years compared to UNS RP alone. The plan was to enroll 200 patients from October 2001–May 2006 in a randomized clinical trial from a single academic center. After 107 patients were randomized in a 3:2 ratio (66 SNG, 41 controls), a protocol-planned interim analysis was performed which reflected potency rates of 18 of 41 (44%) in the SNG group and 10 of 23 (43%) in the control group. Based upon slower-than-estimated accrual (8 per month planned vs 2 per month actual) and a <5% posterior probability that the groups would show a difference, early termination of the trial was recommended by the Data Monitoring Committee. Using data gathered from the 107 participants, the authors concluded that in this single-institution randomized study, unilateral SNG did not result in an increased potency rate at 2 years compared to UNS RP alone based upon a threshold significance level of at least a 20% (absolute) improvement. Secondary endpoints also did not show an improvement in time to potency or urinary function at 1 year. Based upon the power of this study, a smaller benefit could not be excluded. The authors believed that future study designs should anticipate inconsistent compliance with penile rehabilitation and 20–30% patient attrition.

Sugimoto et al. (2009) evaluated 24 patients who underwent unilateral nerve-sparing with contralateral cavernous nerve-grafting or bilateral nerve-grafting and 64 patients who underwent prostatectomy without nerve-sparing procedure. Patients in the nerve-grafting group who recovered potency demonstrated higher sexual function scores compared with those without nerve-sparing procedure. However, the majority of these patients were not satisfied with their sexual function.

Kuwata et al. (2007) prospectively investigated health-related quality of life (HR-QOL), including sexual function, in 66 patients who underwent nerve grafting during a radical prostatectomy in comparison with those who underwent a non-nerve-sparing radical prostatectomy (22 patients had nerve-grafting procedures, 44 underwent non-nerve-sparing and non-nerve-grafting procedures). The observation periods ranged from 12-46 months (median: 29 months). For individuals who had nerve-sparing graft procedures (bilateral or unilateral), the sexual function score was significantly better than in the non-nerve-sparing/non-nerve-grafting patients. The sexual bother score, however, was more serious for the patients who underwent nerve-grafting surgery than for the non-nerve-sparing/non-nerve-grafting patients.

Saito et al. (2007) evaluated 64 patients who underwent a radical prostatectomy and intraoperative electrophysiological confirmation of cavernous nerve preservation. Twelve patients underwent a unilateral interposition sural nerve graft (UNG) for the resected neurovascular bundle. Twenty-one and 31 patients underwent bilateral nerve-sparing (BNS) and unilateral nerve-sparing (UNS) surgery without a nerve graft, respectively. As the age of patients was significantly younger in the UNG group than in the other groups, age-matched analysis also was conducted. In the age-matched analysis, the postoperative sexual function score (SXF) of the UNG group showed an interval level of recovery between those of the BNS and UNS groups at 12 months and reached the same level as the score at 12 months of the BNS group at 18 months postoperatively. The difference in the SXF score between the UNG and UNS groups began to appear after 6 months postoperatively and increased steadily with time. However, the background factors, such as the baseline SXF score, the usage rate of phosphodiesterase 5 inhibitors, and the rate of comorbidities were different between the UNG and UNS groups.

A prospective study by Namiki et al. (2007) evaluated 113 patients undergoing radical retropubic prostatectomy for the rate of recovery of urinary continence and sexual potency. Patients were classified into 3 groups according to the degree of nerve sparing: unilateral nerve preservation with contralateral sural nerve graft interposition, bilateral nerve sparing, and unilateral nerve sparing. The bilateral nerve sparing group showed the fastest recovery, although by 24 months there were no significant differences observed between the bilateral nerve sparing group and the unilateral nerve sparing group with sural nerve grafting. The bilateral nerve sparing group reported a better sexual function score than the unilateral nerve sparing group throughout the postoperative period. During the first year postoperatively, the bilateral nerve sparing group and the unilateral nerve sparing group with sural nerve grafting had better urinary function results than the unilateral nerve sparing group. The authors concluded that the nerve graft procedure may contribute to the recovery of urinary function as well as sexual function after radical retropubic prostatectomy; however these findings need to be validated in a randomized trial.
According to the National Comprehensive Care Network (NCCN) prostate cancer guideline, replacement of resected nerves with nerve grafts has not been shown to be beneficial for recovery of erectile function after radical prostatectomy (NCCN 2017).

A clinical trial is recruiting participants in order to evaluate the use of the implantation of the allogenic nerve graft Avance® in patients undergoing non nerve-sparing radical prostatectomy. For more information, please go to www.clinicaltrials.gov.

The evidence is insufficient to conclude that this surgical technique is equivalent to bilateral nerve sparing prostatectomy or that long-term outcomes are improved by nerve grafting.

**U.S. FOOD AND DRUG ADMINISTRATION (FDA)**

Sural nerve transplant is a procedure, and as such, is not regulated by the FDA.

**CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)**

Medicare does not have a National Coverage Determination (NCD) for nerve grafts to restore erectile function during radical prostatectomy. Local Coverage Determinations (LCDs) do not exist at this time. However, there are LCDs that address the CPT codes 55899 and 64999. Refer to the LCDs for Non-Covered Services and Services That Are Not Reasonable and Necessary.


**REFERENCES**


**POLICY HISTORY/REVISION INFORMATION**

<table>
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| 09/01/2017 | • Updated supporting information to reflect the most current clinical evidence and references; no change to coverage rationale or list of applicable codes  
|           | • Archived previous version 2016T0372N                                              |