Surgery for the Prevention and Treatment of Lymphedema (for North Carolina Only)

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Instructions for Use

Table of Contents **Page**

Related Policy

- Pneumatic Compression Devices (for North Carolina Only)

Application

This Medical Policy only applies to the state of North Carolina.

Coverage Rationale

For medical necessity clinical coverage criteria, refer to the North Carolina (Division of Health Benefits) Clinical Coverage Policy, Reconstructive Surgery, 1-O-1: Reconstructive and Cosmetic Surgery.

Other surgical procedures for the treatment or prevention of Lymphedema are unproven and not medically necessary due to insufficient evidence of safety and/or efficacy. These procedures include but are not limited to:

- Axillary reverse mapping (ARM)
- Microsurgical treatment
  - Lymphaticovenous Anastomosis
  - Lymphovenous bypass
- Vascularized Lymph Node Transfer

Definitions

Lymphaticovenular/Lymphaticovenous Anastomosis: A surgical procedure that connects small lymphatic vessels to adjacent venules to shunt excess lymphatic fluid (American Society of Plastic Surgeons).

Lymphedema: The build-up of fluid in soft body tissues when the lymph system is damaged or blocked (NCI).

Vascularized Lymph Node Transfer: A surgical procedure that transfers skin, fat, and lymph nodes for lymphatic reconstruction (American Society of Plastic Surgeons).

Applicable Codes

The following list(s) of procedure and/or diagnosis 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 federal, state, or contractual requirements 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 Guidelines may apply.

CPT Code	Description
*1019T	Lymphovenous bypass, including robotic assistance, when performed, per extremity
15830	Excision, excessive skin and subcutaneous tissue (includes lipectomy); abdomen, infraumbilical panniculectomy
15832	Excision, excessive skin and subcutaneous tissue (includes lipectomy); thigh
15833	Excision, excessive skin and subcutaneous tissue (includes lipectomy); leg
15834	Excision, excessive skin and subcutaneous tissue (includes lipectomy); hip
15835	Excision, excessive skin and subcutaneous tissue (includes lipectomy); buttock
15836	Excision, excessive skin and subcutaneous tissue (includes lipectomy); arm
15837	Excision, excessive skin and subcutaneous tissue (includes lipectomy); forearm or hand
15838	Excision, excessive skin and subcutaneous tissue (includes lipectomy); submental fat pad
15839	Excision, excessive skin and subcutaneous tissue (includes lipectomy); other area
15847	Excision, excessive skin and subcutaneous tissue (includes lipectomy), abdomen (e.g., abdominoplasty) (includes umbilical transposition and fascial plication) (List separately in addition to code for primary procedure)
*15876	Suction assisted lipectomy; head and neck
*15877	Suction assisted lipectomy; trunk
*15878	Suction assisted lipectomy; upper extremity
*15879	Suction assisted lipectomy; lower extremity
*38999	Unlisted procedure, hemic or lymphatic system
*49906	Free omental flap with microvascular anastomosis

Codes labeled with an asterisk (*) are not on the State of North Carolina Medicaid Fee Schedule and therefore may not be covered by the State of North Carolina Medicaid Program.

Description of Services

Lymphedema is a chronic, progressive, and often incurable disease in which there is impaired drainage of interstitial fluid through the lymphatic system resulting in the accumulation of fluid and hypertrophic fat. There are two types of Lymphedema. Primary Lymphedema, in which there is abnormal development of the lymphatic system, and secondary Lymphedema which is caused by damage to the lymphatic system from trauma, infections, and cancer surgeries and radiation. It is characterized by non-pitting swelling of an extremity (that typically excludes the fingers and toes) or trunk. It is associated with wound healing impairment, recurrent skin infections, and decreased quality of life.

The first line treatment of Lymphedema is conservative management with complete decongestive therapy (CDT) which is a combination of compressive garments, skin hygiene, limb compression, manual lymphatic drainage, and exercise. Pneumatic compression may also provide additional improvement when used adjunctively. For individuals whose Lymphedema is not controlled by CDT, surgical procedures such as liposuction/lipectomy, subcutaneous excision, and microsurgical procedures such as lymphovenous bypass (LVA) and Vascularized Lymph Node Transfer (VLNT) have been proposed (Kareh, 2020; NCI, 2019). LVA is a super microsurgical technique in which an anastomosis is created between the congested lymphatic vessel and a vein to improve lymphatic fluid transport.

Axillary Reverse Mapping (ARM) is a technique used during lymph node dissection in which a dye is injected into the upper arm to identify the lymphatics and lymph nodes that are primarily draining that extremity. It is hypothesized to help the surgeon identify and potentially preserve those lymph nodes, or in some cases remove the lymph nodes but preserve the lymphatics of the upper arm.

Axillary Reverse Mapping (ARM)

While promising, many studies on ARM involve relatively small patient cohorts, short follow-up periods, inconsistent mapping and nodal dissection techniques and lack standardized outcome measures. These limit the generalizability of the results, make it difficult to assess the long-term efficacy and risks, particularly regarding lymphedema development over time as well as making it complex to draw definitive conclusions regarding the safety, efficacy and long term outcomes of ARM for preventing lymphedema, as well as non-inferior oncologic outcomes.

In a 2025 systematic review and meta-analysis, Fan et al. evaluated the quality of life (QoL) and oncologic outcomes of ARM used for the prevention of lymphedema in individuals with breast cancer. Seven RCTs and observational studies comprised of 1820 individuals were included, of which 866 were included in the ARM group, and 954 in the control group (individuals without axillary reverse mapping). A random effects model showed that there was a significant difference in QoL between the two groups in favor of ALN, and no significant difference in shoulder dysfunction or hematoma. Four of the studies assessed the number of retrieved lymph nodes and there was no difference in the number. There was also no difference in the number of positive lymph nodes in the three reporting studies. The authors concluded that ARM reduces the incidence of upper limb lymphedema, however, with regard to oncological outcomes, the existing tracing technology cannot guarantee the correct identification of the lymphatic system between the breast and arm leading to an increased risk of metastasis in retained nodes. Additional multicenter randomized controlled trials are needed to further evaluate the efficacy and safety of ARM.

In a 2022 systematic review and pooled analysis of randomized controlled trials, Co et al. evaluated the role of ARM compared to conventional axillary dissection (AD) in breast cancer surgery. The primary objective was to compare the post-operative lymphedema rate. The secondary aim was oncological safety shown by the possibility of ARM nodal metastasis and axillary recurrence rate. Five RCTs comprised of 1696 individuals with comparable demographics were included. Among these, 802 individuals received ARM and 894 received AD. The majority of the individuals had invasive ductal carcinoma with T2 tumor staging and N1 nodal metastasis. All included RCTs used methylene blue as the mapping agent, with two using additional radioisotope and fluorescent detection as secondary mapping. The number of ARM detected nodes varied from one to three. Lymphedema measurement was either limb circumference or volumetry. The results showed an overall lower rate of post-operative lymphedema in the ARM individuals across all RCTs. The pooled lymphedema rate in the ARM group was 4.8% compared to 18.8% in the AD group. Axillary recurrence rate was identical in the two groups at 1.03% and were all in one RCT (which included most of the individuals in this SR) at 37 months, with no other RCTs reporting a recurrence in follow-up ranging from six to 33 months. The authors concluded that these results show that ARM is feasible and non-inferior to AD. These results are limited by one RCT providing the majority of the participants (1191), a wide range of follow up on oncologic safety, differing outcome measurements for lymphedema improvement, as well as variations in ARM technique. Further high-quality research focusing on standardized procedures and focusing on oncologic outcomes are needed.

Abbaci (2022) reported the results of the ARMONIC clinical trial that assessed the ARM technique in a large cohort of participants, and analyzed the predictive clinical factors for ARM lymph node metastasis, and to determine whether fluorescence signal intensity in ARM nodes could be a predictive factor of subsequent lymphedema. One hundred and nine patients received mastectomy and ALND for primary cancer. Prior to mastectomy incision, indocyanine green (ICG) was injected intradermally in the ipsilateral upper extremity in the second interdigital space and then on the inner face of the elbow. The presence of ICG was then detected with a near-infrared fluorescence (NIR) fluorescence camera. After mastectomy and during ALND, fluorescent lymph nodes were identified by the surgeon and removed separately and isolated from the rest of the axillary lymph nodes for pathological examination. The results showed that fluorescent lymphatic ducts were visible in the forearm in more than 83% of the patients and in the upper arm in more than 66% patients prior to mastectomy incision. ARM lymph nodes were not detected in 6 patients. Of the103 patients with a successful ARM procedure, 55 had metastatic axillary lymph nodes in the final histology, and 20 had metastatic ARM lymph nodes. Eighteen participants had both metastasis-positive ARM nodes and ALND. Two participants had only metastatic ARM lymph nodes but not in the rest of the axillary lymph nodes. Of all 223 ARM lymph nodes, 195 had no tumor cells, 3 had isolated tumor cells, 3 had micro-metastases, 15 had macro-metastases and 7 had macro-metastases with extracapsular invasion. The authors concluded that although the ARM procedure identifies lymph nodes, signal intensity may not be a reliable diagnosis tool to consider the conservation of the arm lymph node. Participants were not followed long term to assess the correlation with signal intensity and subsequent lymphedema.

In a 2021 systematic review and meta-analysis of randomized controlled trials, Guo et al. assessed the effectiveness of ARM during ALND in preventing breast cancer related lymphedema as the primary outcome. Secondary outcomes were oncological safety and shoulder movement. Five RCTs were included that were comprised of 1659 participants. A total of

786 patients received ARM of the nodes and lymphatics during ALND and 873 patients received conventional ALND (control). Follow up time ranged from 6-37 months. Three studies used blue dye alone, 1 study combined blue dye and fluorescence, and 1 study combined blue dye with radioisotope. Assessment of lymphedema was measured with volumetrics in 3 studies, and 2 studies used arm circumference measurement. In the 5 included RCTs, the participants had clinical stage II or III. All 5 had a low to moderate risk of bias. The results showed that in the group that received ARM and ALND, 37 individuals developed arm lymphedema, and 164 developed lymphedema In the control group (ALND alone). Two studies reported oncological safety (determined by the metastatic rate of ARM nodes) and shoulder movement profiles and both showed no significant differences between the two groups. The authors concluded that while ARM can reduce the risk of BCRL, there is a risk of upper limb lymph node metastasis and further high quality research is needed.

Surgical Treatments

Late stage lymphedema may not respond to standard complex decongestive therapy and several types of surgical interventions are being investigated. These include, liposuction, vascularized lymph node transfer (VLNT) and lymphaticovenous anastomosis (LVA). LVA and VLNT have also been investigated for the prevention of lymphedema, and for that indication, they are done at the time of the index procedure. This is often called Lymphatic Microsurgical Healing Approach (LYMPHA). These techniques are very specialized and there is significant variability in patient characteristics and lack of uniformity in outcome measures complicating meta-analyses. High quality studies with longer term follow up is necessary to assess the safety, efficacy and durability of these treatments.

Gaxiola-García et al. (2024) conducted a systematic literature review on the surgical management of primary lymphedema. Data was extracted from 55 articles comprised of 485 individuals with primary lymphedema to evaluate the outcomes of lymphaticovenous anastomosis (LVA) and vascularized lymph node transfer (VLNT), and of tissue removal procedures such as suction-assisted lipectomy (SAL) and excision. Treatment and numbers of individuals were LVA (177), VLNT (82), SAL (102), and excisional procedures (124). Seven reported results for the upper extremity and 53 reported results for lower extremity lymphedema. The average follow-up was 24.74 months reported in 47 studies. In the results for LVA , 24 studies reported outcomes in 177 individuals and showed that the most common stage treated with LVAs was ISL II (130). Surgical outcomes were not homogeneously reported, but in most studies, an improvement of the LE lymphedema index, the QoL, and lymphedema symptoms, as well as a reduction of the cross sectional area, episodes of cellulitis, the need for compression garments, and circumferential measures were described. The overall complication rate was 1%. The most common complications were several episodes of a lymphatic fluid leak in one patient and failure of the anastomosis. There were 12 articles comprised of 82 individuals that reported results for VLNT. These results showed inconsistent outcome reporting, with some stating that the average circumference reduction rate ranged from 17.2 to 61%, tonicity was reduced by 6.8% and the episodes of cellulitis decreased by 2.67 to 3 times/year during a follow-up ranging from 16 to 63 months. Most studies reported increased QOL. The overall complication rate was 13% and included hematoma, venous congestion or thrombosis, and microsurgical revisions. With regard to SAL, the results of 102 individuals across 8 studies showed a mean reduction of original excess volume from 71.9% to 94%. Several articles reported a reduction in cellulitis episodes and an improvement in QoL. The overall complication rate was 11% and included limited liposuction in certain areas, skin necrosis, significant blood loss, cellulitis, decubitus ulcers, and temporary peroneal nerve palsy. Fifteen studies reported the outcomes of excisional procedures in 124 individuals. These results showed individuals with Stage III or advanced disease. Several different excisional techniques were used across studies and the results showed significant reduction in the size of the LE, improvement of symptoms, and a reduction in the episodes of lymphangitis and cellulitis over a follow-up period ranging from 1 to 60 months. Poor cosmetic results were frequently reported and the overall complication rate was 46%. These included injury of the internal saphenous nerve, blood loss requiring transfusion, delayed wound healing, dermatosis, skin graft loss, presence of crevices and pits, chronic ulceration, the need of scar revision and release, seroma, amputation, skin necrosis, hypertrophic scarring, and focal wound tenderness. The authors concluded that primary lymphedema is amenable to surgical treatment and the currently performed procedures have effectively improved symptoms and QoL in this population. This review is limited by a lack of comparison to standard non-surgical treatment as well as inconsistent staging and reporting of some outcomes. Further high quality research is needed to validate these findings.

In a 2021 systematic review and meta-analysis sponsored by the American Association of Plastic Surgeons, Chang et al. examined the published evidence to assess the efficacy and safety of surgical treatment of lymphedema as well as preventing secondary lymphedema of the upper (UE) and lower extremity (LE) lymphedema as well as develop consensus statements and recommendations. Treatment of lymphedema included lymphovenous bypass, vascular lymph node transplantation and liposuction and comparators included surgery and compression therapy. For the prevention of secondary lymphedema, lymphovenous bypass was included with no surgery as the comparator. Studies included randomized controlled trials, observational studies and retrospective cohort and case-controlled publications. The series that reported relevant pre and post operative outcomes were also included. Seventy one articles representing 66 studies were included and of these, 43 were case series. For liposuction, based on very low quality evidence, the results showed

that the combination of liposuction and controlled compression therapy reduced limb volume significantly more than controlled compression therapy alone in individuals with stage I-III (International Society of Lymphology) UE lymphedema. In studies that compared lymphovenous bypass to compression therapy in the UE and LE, the results showed decreased limb volume when compared to compression therapy alone. Almost half of the 81 individuals were able to stop using compression garments, and the three case series reported a significant reduction in episodes of cellulitis. Vascularized lymph node transfer (VLNT) was reported in 4 studies of 300 patients and compared VLNT to physical therapy. These results showed significant reductions in arm volume, pain, heaviness, and overall function in patients who underwent VLNT compared to physical therapy alone. In 5 studies, VLNT combined with compression garments and complex decongestive therapy and the results showed significant reduction in circumference, and incidence of cellulitis was reduced. The authors concluded that there is evidence to support surgical treatments in reducing the severity UE and LE lymphedema, but none are a cure. No consensus was reached on which procedure is more effective, This consensus review is limited by a high degree of heterogeneity among the procedure's studies and combinations thereof. The authors also noted that the meta-analysis has several limitations: Only two randomized controlled trials were included. The majority of the studies included were observational studies, which are at high risk of bias, and the conclusions that can be drawn from these studies are limited. Additional well-designed research that includes more objective outcome reporting and longer follow-up is needed to validate these findings.

Microsurgical Procedures

In a 2025 systematic review and meta-analysis, Hahn et al. analyzed the results of the clinical improvement in extremity lymphedema in individuals that underwent lymphaticovenous anastomosis (LVA), vascularized lymph node transfer (VLNT), or combination of the two. Included studies reported various etiologies of unilateral secondary lymphedema that reported clinical improvement calculated by circumference or volume. Fifty-two studies, (including retrospective, prospective, cross-sectional and randomized controlled trials) comprised of 1920 extremities from the same number of individuals across 15 different countries were included. Of the 1073 individuals treated for UEL, 528 underwent LVA, 496 underwent VLNT, and 49 received combined treatments. Of the 847 extremities treated for LEL, 775 underwent LVA, and 72 underwent VLNT and none received combined treatments. Lymphedema severity was assessed using various classifications such as International Society of Lymphology, Cheng Lymphedema Grade, Campisi Staging of Lymphedema, and M.D. Anderson Cancer Center. Eleven studies did not report lymphedema severity. In the studies that reported the number of anastomoses during LVA, there was a mean of 3.39 for UEL, and 4.50 for LEL. For studies that reported the results of VLNT for UEL included donor lymph nodes harvested form the groin, gastroepiploic, submental, jejunal mesenteric, and a mix of flap types. Most studies reported post-operative care protocols which included compression therapy, manual drainage or both. Four studies implemented protocols in which individuals were instructed to have no compression or physical therapy. Most studies reported ≥ 12 month follow up. With regard to clinical improvement of lymphedema, the results showed a pooled mean clinical improvement of 36.46% (95% CI: 29.44–43.48), with a high degree of heterogeneity between studies. Specifically, a clinical improvement of 29.44% (95% CI: 15.58–43.29) was observed in upper extremities following LVA, 41.66% (95% CI: 34.13–49.20) following VLNT, and 32.80% (95% CI: 21.96–43.64) in the one study that included UEL outcomes with a combined VLNT + LVA surgical approach. For LEL, the pooled mean clinical improvement in LEL was 34.16% (95% CI: 23.93–44.40), with a high degree of heterogeneity between studies. Specifically, clinical improvement of 31.87% (95% CI: 18.60–45.14) was observed following LVA, and 39.53% (95% CI: 19.37–59.69) following VLNT. Furthermore, in individuals with LEL who underwent VLNT, clinical improvement was significantly different according to the donor flap type used. Donor flaps containing gastroepiploic lymph nodes had a pooled mean clinical improvement of 43.48% (20.43–66.52), while those that contained submental lymph nodes improved by 19.80% (95% CI:16.75–22.85) (p = 0.005). For both extremities, the clinical improvement was greater following VLNT than LVA. These results showed greater improvement in individuals with more severe lymphedema but this was not statistically significant. This study is limited by heterogeneity of data. Some studies did not report the BMI of participants, pre-operative interventions and number of anastomoses in LVA, and type and lymph node counts within donor site flaps with VLNT which limits the ability to draw conclusions on outcomes. Additional research with longer term follow-up is needed.

In a 2023 systematic review and meta-analysis, Meuli et al. (included in Hahn 2025) reported on the outcomes of the two most common microsurgical treatments for lymphedema. One hundred and fifty three articles, comprised of 6496 individuals that documented outcomes following lymphovenous anastomosis (LVA) and vascularized lymph node transfers (VLNTs) in adult patients were included. The most frequently reported outcomes were reductions in circumference and volume and the number of skin infections per year. The results showed that among the 29 studies (1002 individuals) that reported reduced circumference, 20 investigated VLNT, 8 LVA and one investigated a combination of both and showed a 36% reduction. Regarding volume change, 12 studies (587 patients) provided sufficient data and 5 of these investigated LVA, 6 investigated VLNT, and 1 investigated a combination of both techniques and showed an overall reduction in excess volume -32.7%. Regarding skin infections, 8 studies contained sufficient data and five out of these eight studies investigated VLNT and three investigated LVA. The overall change in the number of cutaneous infections episode per year for the 248 patients included was -1.9. The authors concluded that LVA and VLT are effective

in the treatment for reducing severity of lymphedema. This review is limited by a lack of randomized controlled trials and heterogeneity of results reporting.

Lymphaticovenous Anastomosis (LVA)/Lymphovenous Bypass

In a 2025 ECRI evidence analysis, it was concluded that based on 11 low quality systematic reviews, lymphovenous bypass appears safe, and provides clinical and durable edema relief and quality of life improvement in individuals with secondary peripheral lymphedema, however the overall quality of the evidence limits the confidence in this conclusion. Furthermore, it was concluded that the benefits for other lymphedema presentations (primary, head and neck, and genital lymphedema) is unclear because relevant studies for these are also mostly low quality and variable in methodology. Large, prospective, multicenter studies are needed to validate lymphovenous bypass in individuals with secondary lymphedema and to more thoroughly evaluate the efficacy.

Jonis et al. (2024) reported the six-month interim results of a prospective, multi-center randomized controlled trial on the health related QoL (HrQoL) in individuals with breast cancer related lymphedema undergoing LVA compared to complete decongestive therapy (CDT). One hundred adult women with unilateral BCRL, with early stage lymphedema and viable lymphatic vessels were included. Niney-two completed six month follow up and are included in these results. Forty-six participants were randomly assigned to receive LVA, and 46 received conservative treatment. The primary outcome measure was HrQol measured by the lymphedema functioning disability and health (Lymph-ICF) questionnaire. Secondary outcomes were volume difference (measured by water displacement), the Upper Extremity Lymphedema (UEL) index, and the daily use of compression garments after three and six months. Eligibility for LVA was determined by near infrared fluorescence imaging. During surgery, viable lymphatic collecting vessel and similarly sized adjacent recipient venules were identified in the subdermal plane, and an end-to-end anastomosis was performed and patency confirmed with a surgical microscope. Between one and five anastomoses were performed in a lymphedematous arm. For the primary outcome, the results in the LVA group showed the mean difference in the total score of the Lymph-ICF between baseline and follow up after three and six months was 8.93 ±22.71 ($p > 0.05$) and 8.57 ±22.56 ($p > 0.05$), respectively. For physical and mental function, a decrease of more than 10 points was observed after three and six months, which is statistically significant. There were no differences in the Lymph-ICF score in the CDT group. No relationship was found between the total score of the Lymph-ICF and preoperative ICG stage, the amount of anastomosis, lymphedema onset, and BMI For the secondary outcomes, the mean absolute difference in limb circumference for the LVA group was 3.65 ±7.24 ($p = 0.002$) after 3 months and 1.84 ±14.6, ($p = 0.497$) after six months. For the CDT group, the mean absolute difference was respectively 3.30 ±31.57 ($p = 0.521$) and − 0.84 ±14.6 ($p = 0.189$) after three and six months respectively. After three months, 17% of participants in the LVA group had completely discontinued compression garments, and this increased to 21.3% at six months. During the same timeframes, 21.7% partially discontinued use. There was no statistically significant differences in volume reduction or limb circumference between the two groups. At six months, five cases of erysipelas occurred in the CDT group and 3 in the LVA group. No serious AEs were reported. The authors concluded that LVA results in an improvement of physical and mental function in individuals with BCRL, and that these interim results are promising. Studies with larger numbers of participants and longer follow up are needed to validate these findings.

Gupta et al. (2021) conducted a systematic review to analyze the outcomes of LVA for primary or secondary upper extremity (UE) lymphedema in various stages. Sixteen studies comprising 349 patients and 244 upper limbs were included. The authors reported on post operative limb circumference/volume reduction and differential, and patient reported improvements in quality of life and symptoms. Studies on filariasis-related lymphedema were excluded. The results showed, among 14 studies that reported on objective improvements, 11 stratified outcomes by UE, and improvements were seen in more than 90% of the patients. Seven studies reported on the results based on the Campisi stage of lymphedema, and 2 reported LVA resulted in better outcomes when done in the earlier stages. The authors concluded that LVA is a safe and effective emerging treatment for UE lymphedema refractory to decompressive treatment, and large controlled studies are required to validate these findings which are limited by lack of comparison to contemporary comparison groups undergoing a different intervention.

A 2020 Hayes health technology assessment, updated in 2022, regarding lymphovenous anastomosis for the treatment of primary and secondary lymphedema that has not responded adequately to conservative therapies, focused on the effectiveness on lymphatic function, limb size reduction and subjective changes such as decreased infections and changes in the use of compression garments. Based on a moderate sized body of low-quality evidence, it was concluded that LVA appears to be safe with a low risk of complications. There was an overall positive impact on baseline limb circumference, excess volume and patient reported outcomes such as the use of compression garments and infections. There is insufficient evidence to come to a conclusion regarding the efficacy compared to other surgical procedures or non-surgical procedures. This suggests the potential benefit of LVA, and prospective comparative or randomized controlled trials are warranted. The report's overall conclusion is that this technique has potential but unproven benefit.

Vascularized Lymph Node Transfer (VLNT)

Li et al. (2021) completed a systematic literature review and meta-analysis on intra-abdominal vascularized lymph node transfer for the treatment of lymphedema. Primary outcomes were circumference/volume reduction, episodes of cellulitis reduction and lymph flow assessment. Secondary outcomes included donor and recipient site complications. Twenty-one studies (one non-randomized controlled trial, 3 retrospective cohort studies, 5 prospective case series, and 12 retrospective case series) with omental/gastroepiploic, jejunal, ileocecal, and appendicular donor sites totaling 594 individuals met the inclusion criteria. The results showed a mean reduction in circumference and volume rate ranged from 0.38% to 70.8%. Significant reduction in infectious episodes was reported in 10 studies. The pooled donor-site complication rate was 1.4%, and the pooled recipient-site complication rate was 3.2%. No donor site lymph disfunction was reported. The authors concluded that low quality evidence suggests there is improvement in lymphedema following intra-abdominal VLNT. However, they also note that these results were of low quality with great heterogeneity across almost all data. Further research with high quality randomized trials are needed to confirm these findings.

In a 2021 systematic review and meta-analysis, Ward et al. evaluated the effectiveness of VLNT in reducing UE and LE volume, and cellulitis episodes in patients with cancer treatment related lymphedema (CTRL). Thirty-one studies totaling 581 patients in which VLNT was the sole therapeutic procedure for CTRL, and reported limb volume, frequency of infection episodes and/or lymphedema specific quality-of-life data, were included. The results showed for the UE, after VLNT the pooled circumferential reduction rates (CRRs) were 42.7% above elbow, and 34.1% below elbow. For the LE, there was a CCR of 46.8% above knee and 54.6% below knee. In addition, individuals experienced approximately 2 fewer cellulitis episodes per year, and had improved lymphoedema-Specific Quality of Life scores. The authors concluded that VLNT reduces limb volume and cellulitis and improves quality of life, however most studies analyzed were of low quality, and had limited to small numbers of participants and lacked long term follow up. Furthermore, there was an overall high degree of heterogeneity across all studies as it related to VLNT, and further methodologically rigorous RCTs that include standardization of reporting are required.

A 2020 Hayes health technology assessment (updated in 2022) on lymph tissue transfer for the physiological microsurgical treatment of lymphedema concluded than an overall low quality body of evidence, LNT and VLNT is associated with better limb size reduction and improved patient reported outcomes when compared with other modalities. However, most of the limitations in the evidence are to be expected given the difficulties of conducting RCTs of complex, individualized microsurgical procedures in a highly heterogenous condition such as lymphedema. Despite the lack of well-designed controlled trials and the weaknesses in the design of the available studies, the current evidence suggests a benefit of LNT in selected patients with lymphedema who have not responded adequately to standard nonsurgical therapies.

Preventive Microsurgical Procedures/Immediate Lymphatic Reconstruction/ Lymphatic Microsurgical Preventive Healing Approach (LYMPHA)

In a 2025 Hayes health technology assessment on immediate lymphatic reconstruction (ILR) surgery for the prevention of breast cancer related lymphedema (BCRL), it was concluded that an overall low-quality body of evidence suggests that the procedure is reasonable safe, but may not provide benefits for most individuals. Seven studies compared ILR to no ILR and six showed a statistically significant reduction in BCRL at one to three year follow-up. From 3% to 16% of individuals receiving ILR developed BCRL, and 19% to 50% of individuals who did not receive ILR developed BCRL suggesting it may not be successful in approximately 10% and not needed in approximately 65%. No studies were identified that evaluated health outcomes for ILR at the time of breast cancer surgery versus lymphatic reconstruction performed after BCRL occurred. Two studies reported QoL and if individuals required compression garments or physical therapy. None of the validated lymphedema tools were used to evaluate severity.

Hinson et al. (2025) performed a systematic review and meta-analysis on the efficacy of immediate LVA for the prevention of secondary lymphedema. Thirty nine studies were included, of which 17 included those that compared the rates of secondary lymphedema in individuals who had and had not received LVA across different oncological indications. These 17 were included in the meta-analysis. There were 3697 individuals included in this study with 1722 individuals receiving immediate LVAs while the remaining 1975 did not and served as the control. The results showed that LVA was associated with a 69% lower risk of secondary lymphedema compared to the control group with 78 individuals developing lymphedema, compared to 692. Heterogeneity was low across the studies suggesting consistency. In subgroup analyses based on type of malignancy, LVA was associated with a 72% reduction in risk of secondary lymphedema compared to the control group in breast surgery, and a 65% reduction for dermatological malignancies (melanoma and squamous cell carcinomas). These findings suggest that immediate LVA is beneficial in reducing the risk of secondary lymphedema after surgical treatment of a malignancy. This study is limited by the retrospective study design of the available literature which also includes a lack of heterogeneity with regard to patient selection, surgical techniques and duration of follow-up. Additional prospective studies with larger number of participants that address the limitations.

In a 2024 retrospective review, Levy et al. reported the 4 year outcomes of patients treated with LYMPHA as lymphedema prophylaxis within their institution (Columbia University Irving Medical Center). Two groups were compared, those who received LYMPHA (45) and those who did not (45). All study participants were women, and the LYMPHA and the non-LYMPHA groups had a similar mean age, BMI and obesity rates. Patients received ALND along with either complete mastectomy or breast-conserving therapy for breast cancer. A similar number of lymph nodes were removed in both groups. Follow up times were 57 and 63 months in the LYMPHA and non-LYMPHA groups respectively. Non-LYMPHA individuals underwent complete mastectomy more frequently than those receiving LYMPHA but had a similar number of nodes removed during ALND. The results showed that overall, lymphedema incidence was 31.1% in the LYMPHA group and 33.3% in the non-LYMPHA group with no significant differences in lymphedema incidences were observed between the LYMPHA and non-LYMPHA groups for those with obesity, and those who received radiation therapy, or those with obesity who also received radiation therapy. The authors concluded that this procedure may not prevent lymphedema long-term in patients who undergo ALND. Additional long-term studies are needed to determine the true potential of LYMPHA for the prevention of lymphedema.

Chungsiriwattana et al. (2023, included in Hinson et al. 2025) conducted a retrospective data review of 29 individuals with melanoma or non-melanoma of the lower extremities that underwent tumor resection with Inguinal lymph node dissection (ILND) and compared long term incidence of lymphedema, and oncological outcomes in those that received lymphaticovenous anastomosis (LVA) at the time of surgery with those that only had surgery. Seven patients underwent immediate LVA at the groin after the ILND (intervention) and the remaining 22 patients underwent resection of the tumor and ILND (control). Outcomes were followed for up to seven years. The results showed 12 cases of lymphedema in the control group and 3 in the LVA group and. The intervention group had a longer median time to lymphedema occurrence than the control group (70 vs. 17 months). Oncological outcomes showed that tumors recurred in 71.4% of patients in the intervention group compared to 31.8% in the control group. Metastases occurred in 5 cases in the intervention group compared to 8 in the control group. The overall median survival time was 44 months for the intervention group. The intervention group had significantly shorter 2 and 5-year recurrence free survival (RFS) and metastatic free survival (MFS) rates. The median survival time was 26 months and 82 months in the intervention and control groups respectively. The authors concluded that while this procedure appears feasible, there was no statistically significant difference in lymphedema occurrence rates. Furthermore, there are significant concerns that LVA results in systematic spread of the original cancer via the lymphatic pathway. This study is limited by a small number of participants and longer term studies are needed to further evaluate LVA at the groin following ILND for preventing lymphedema of the lower extremities.

In 2023, Coriddi et al. (included in Hinson et al., 2025) reported the preliminary results of an ongoing randomized controlled trial (NCT04241341) to examine the efficacy of ILR in decreasing the incidence of breast cancer related lymphedema after axillary lymph node dissection (ALND). Individuals undergoing ALND were randomized in the operating room 1:1 to receive ILR (n = 72) if technically feasible, or no ILR (n = 72), ILR group underwent lymphatic anastomosis to a regional vein using microsurgical techniques; control group had no repair and cut lymphatics were ligated. All individuals in the ILR group had a minimum of one bypass performed, with the thoracoepigastric vein most commonly used as the donor vein. There were so significant differences in baseline demographic and most had received neoadjuvant chemotherapy, adjuvant chemotherapy and adjuvant radiation to the chest wall or axilla. The secondary outcomes assessed the decrease in the risk of BCRL using bioimpedance and indocyanine green (ICG) lymphangiography, and improved QoL in these individuals. Follow-up occurred at six weeks, then every six months for two years following surgery. This preliminary report includes 99 individuals with 12 month follow up, and 70 and 40 individuals with 18 and 24 month follow up respectively. At each follow up, arm volume, bioimpedance, height, BMI, and patient-reported outcomes were measured. A lymphedema diagnosis was made if the relative volume change (RCV) was ≥ 10 at six through 24 months, with subjective lymphedema symptoms as well as anxiety and depression assessed with standardized tools. The use of compression garments and/or decongestive therapy was also recorded. Repeat ICG was completed at 12 and 24 month follow up. The results showed a significantly lower incidence of BCRL in the ILR group, showing 2.0%, 9.5%, and 9. 5% at 12,18, and 24 months respectively compared to the group that did not receive ILR which was 18%, 24% and 32% at the same follow up. There were lower bioimpedance values and less dermal backflow as shown by ICG at 12 and 24 month follow up. The use of compression garments at 24 month follow up was 30% in the ILR group and 43% in the control group. The subjective symptoms of lymphedema showed no significant differences, and tended to worsen over time. The authors concluded that ILV at the time of ALND decreases the cumulative incidence of BCRL at a median follow up of 18 months. The longer term findings with 24 month follow up in a larger cohort of participants in this study are anticipated but to date have not been published. While promising, the preliminary data is underpowered at 24 months as less than 40% of the cohort reached follow-up to complete 24-month data was still ongoing limiting conclusions on durability. Generalizability needs to be confirmed across surgical settings and greater surgeon experience. There also needs to be standardized diagnostic criteria and evaluating long-term durability beyond 2 years.

Ciudad et al. (2022) conducted a systematic review and meta-analysis of the current evidence on the use of preventive lymphatic surgery (PLS) for reducing the risk of cancer related lymphedema (CRL). Twenty-four studies comprising 830

LVA procedures on 1547 individuals fulfilled the inclusion criteria. Eighteen studies were observational studies, two were randomized control studies, one was a case series, and three were abstracts or conference presentations. 1247 patients (80.6%) underwent axillary lymph node dissection (ALND), three-hundred individuals (19.4%) underwent ilioinguinal, para-aortic, inguinofemoral lymph node dissection, and/or wide tissue excision of the inguinal region (the type of cancer was highly heterogenous). The results showed in single cohort studies, the pooled cumulative rate of upper extremity lymphedema after ALND and PLS was 5.15% with no significant heterogeneity across studies. The pooled cumulative rate of lower extremity lymphedema after oncological surgical treatment and PLS was 6.66%. In double-arm studies for upper limb lymphedema, the pooled analysis showed that PLS reduced the rate of lymphedema after ALND by 18.7 per 100 patients' heterogeneity was substantial and had significant clinical relevance. For lower limb lymphedema the pooled analysis showed that PLS reduced the rate of lymphedema after ilioinguinal lymph node dissection by 30.3 per 100 patients treated with no significant heterogeneity across the studies. The authors concluded that PLS is a promising treatment for the prevention of lymphedema following cancer related lymph node dissection. This systematic review is limited by the highly heterogenous nature of the included studies. This includes different diagnostic methods, levels, and regions of LND, type of LVA, different follow up periods, and patient characteristics such as past radiation therapy. High-quality studies are necessary to determine the outcomes and determine recommendations regarding the use of preventive lymphatic surgery.

In a 2022 single -arm meta-analysis, Chun et al. evaluated the effectiveness of immediate lymphatic reconstruction (ILR) to prevent secondary lymphedema and provide suggestions for using the LYMPHA approach. This meta-analysis included 789 individuals across 13 studies, and included upper and lower limb ILR, 10 studies address ILR for breast cancer axillary lymph node dissection (ALND) and 3 addressed malignant melanoma inguinal lymphadenectomy. The results showed for upper extremity LE, the pooled analysis indicated that 2.75% of individuals developed LE after ALND with ILR. The average pooled follow up time was 11.6 months and that the incidence of LE started to increase immediately post operatively at 0.92%, 2.19% at 6 months and 2.50% at 12 months, and continued to increase beyond 12 months with the highest incident rate between one and two years. For lower extremity following lymphadenectomy, the results showed 3.6% of patients developed lymphedema after inguinal lymphadenectomy with ILR for malignant melanoma treatment. The authors acknowledge there is a limitation to LYMPHA for lower extremity ILR due to the availability of recipient veins with appropriate size, arc of rotation, and venous valvular sufficiency. The authors concluded that ILR is a promising technique to mitigate lymphedema. Future research should address standardization of techniques and focus on specific patient populations and show the short-term efficacy and long-term outcomes. The findings are limited by the lack of a comparison group.

In a 2022 systematic review and meta-analysis, Hill et al. analyzed the current evidence on the effects of immediate lymphatic reconstruction (ILR) on the incidence of breast cancer-related lymphedema (BCRL) following ALND. Eleven studies totaling 417 breast cancer patients met the inclusion criteria. These studies included one randomized control trial, and ten observational studies. Four of the 11 studies with control groups could be included in a meta-analysis. The results showed 24 of 417 (5.7%) individuals developed BCRL following ILR. Meta-analysis revealed that in the ILR group, 6 of 90 individuals (6.7%) developed lymphedema, whereas in the control group, 17 of 50 individuals (34%) developed lymphedema. Those in the ILR group had a risk ratio of 0.22 (CI, 0.09 -0.52) of lymphedema with a number needed to treat (NNT) of four. The authors concluded that ILR can prevent BCRL, however the findings are limited by lack of randomization. Randomized control trials are underway to validate these findings. ILR may prove to be a beneficial intervention for improving the quality of life of breast cancer survivors.

In a 2020 ECRI clinical evidence assessment regarding LYMPHA for Preventing Lymphedema, it was concluded that based on low-quality but consistent evidence from one systematic review (SR) with meta-analysis and one nonrandomized comparative study, LYMPHA procedures performed during axillary lymph node dissection (ALND) reduce lymphedema rates compared to ALND alone in patients with breast cancer, and larger, prospective controlled studies are needed to verify these findings and to determine whether it improves outcomes for patients with other cancer types who undergo lymph node dissection.

In a 2019 Cochrane systematic review of randomized controlled trials, Markkula et al. assessed and compared the efficacy of surgical interventions for the prevention of lymphedema in the arm after breast cancer treatment and to assess and compare to the treatment of existing lymphedema. Two studies involving 95 participants reported on the effectiveness of lymphaticovenular anastomosis for the prevention of breast cancer related lymphedema compared to non -surgical management and showed that LVA appears to result in a reduction in the incidence of lymphedema. Both studies had an unclear risk of bias and did not report secondary outcomes. The overall certainty of the evidence was low. One study involving 36 participants reported on the effectiveness of vascularized lymph node transfer for the treatment of existing lymphedema compared to no treatment, and showed that for participants with Stage 2 lymphedema, there were reductions in limb volume, pain scores, heaviness sensation and overall function. Overall, the evidence was very low. The authors concluded that there is currently not enough high-quality evidence to support the widespread adoption of

lymphaticovenular anastomosis or vascularized lymph node transfer techniques for the prevention or treatment of lymphedema. Well-designed randomized controlled trials that compare the effectiveness of surgical treatments to each other, and against the current gold standard non-surgical treatments are needed.

Head and Neck Cancer Treatment Related Lymphedema

Imholz et al. (2025) systematically reviewed the current literature on lymphatic microsurgery in patients with face and neck lymphedema due to head and neck cancer treatments. The included articles were eight case reports and two retrospective studies and totaled 20 individuals receiving different types and combinations of lymphatic reconstruction including LVA, lymph node-to-vein anastomosis (LNVA), lymph vessel transplantation and the usage of a tubed deltopectoral flap as a "lymphatic bridge". Eight out of the ten studies evaluated were for LVA, in the preauricular, buccal and submandibular regions. The other types of reconstruction were limited to case reports. All studies reported an improvement of head and neck lymphedema (HNL) after reconstructive surgery using different objective methods for measuring results, including facial measurements and subcutaneous thickness determination via CT, and subjectively using the Lymphedema Symptom Intensity and Distress Score, and Swallowing Quality of Life (SWAL-QOL), as well as clinician-reported outcome measures, namely the MD Anderson Cancer Center Head and Neck Lymphedema rating scale. Six studies used exclusively pre and post-operative photographs as the objective outcome assessment to assess improved eyelid function, alleviation of symptoms or patient satisfaction. The results showed that microsurgical lymphatic reconstruction is a safe a feasible treatment option for HNL, particularly LVA. However, all studies were of low quality with small numbers of participants (or case series) as well as inconsistent outcome measures which limit the ability to draw firm long term conclusions about durability or complications. Additional high quality studies are needed.

A 2020 Hayes health technology assessment, updated in 2022, reported on the use of liposuction plus compression therapy for the reductive surgical treatment of lymphedema of moderate-to-severe, non-pitting, primary or secondary lymphedema of the upper and lower extremities (UEL or LEL) in adults, as well as adults with head and neck cancer treatment–related lymphedema. A very small body of low-quality evidence in patients with head and neck cancer–related lymphedema suggests that liposuction compared with no liposuction does have a positive impact on patient-reported subjective outcomes assessed 6 months after surgery.

Tyker et al. (2019) conducted a systematic review to evaluate all established treatment modalities for lymphedema resulting from head and neck cancer treatment. The authors concluded that the overall poor study quality limited the ability to draw conclusions regarding the benefit of these treatments. All studies had limitations of short follow-up times, lack of blinding and randomization of participants, heterogenous patient populations, and low numbers of participants. Large multi-center RCTs which directly compare treatment modalities are required.

Alamoudi et al. (2018) conducted a randomized controlled trial at an oncology center in tertiary hospital setting to review the outcomes of submental liposuction in head and neck cancer patients with post treatment lymphedema and to compare the outcomes with a control group. Twenty one participants met the inclusion criteria, however one died before completing post operative evaluation and was excluded in the final results. All participants had completed radiation therapy and eleven underwent neck dissection and radiation with or without chemotherapy, had been disease free for one year and had no previous facial plastic surgery procedures. Outcome measures included patient reported results in the form of two validated surveys, the Derriford Appearance Scale (DAS59) which objectively measures psychological symptoms associated with aesthetic disfigurement and deformities, and the Modified Blepharoplasty Outcome Evaluation (MBOE) which was modified from the Blepharoplasty Outcome Evaluation to meet the needs of the submental region. The surveys were completed preoperatively, at the time of surgery, and six months or more postoperatively. The results showed that for both the DAS59 and MBOE scores, overall there was a statistically significant improvement in the intervention group compared to the control group. The authors concluded that submental liposuction is safe and effective and improves QOL and self perception in patients with lymphedema secondary to head and neck radiation therapy. This study is limited by the lack of a comparison group to non surgical therapies as well as a lack of objective assessment by blinded reviewers. Further research comparing liposuction in the submental region to established treatment as well as long term outcomes is required to validate these findings.

Clinical Practice Guidelines

American Association of Plastic Surgeons (AAPS)

In the 2021 consensus guidelines on surgical treatment of lymphedema (Chang et al.) the AAPS concluded the following:

LVA and VLNT:

- There is evidence to support that lymphaticovenous anastomosis can be effective in reducing severity of lymphedema (GRADE 1C) with a large number of studies demonstrating better outcomes in patients with earlier stage of disease.

- There is evidence to support that vascularized lymph node transfer can be effective in reducing the severity of lymphedema (GRADE 1B).
- There is no consensus on which procedure is more effective; and
- Neither procedure is a cure for lymphedema.

Prophylactic Lymphovenous Bypass:
- Few studies show this procedure reduces the incidence of lymphedema and further studies with longer follow up are required (GRADE 1B).

Liposuction:
- Debulking procedures such as liposuction are effective in addressing the nonfluid component such as fat involving lymphedema (GRADE 1C).
- There is a role for liposuction combined with physiologic procedures (physical therapy and compression), although the timing of each procedure is currently unresolved (GRADE 1C).

This guideline also states that lymphatic procedures are highly complex and surgery should be performed at a high volume center with training in microsurgery to lower the incidence of complications.

Additional consensus recommendations:
- A consensus on staging of lymphedema and preoperative and postoperative evaluations is needed.
- More quantitative methods for measuring fat, fluid, and physiologic measures and immunologic function are required.
- There is a need for better designed studies that include more objective reporting of outcomes and longer follow-up.

National Comprehensive Cancer Network (NCCN)

The 2025 NCCN Survivorship guidelines contain a section on lymphedema diagnosis and management and lists treatment options as compression garments, manual lymphatic drainage, pneumatic compression devices, and supervised progressive resistance and range of motion training. It does not mention liposuction, excisional procedures or microsurgical treatments. It also states that for select patients, consider referral to a lymphedema surgeon, in consultation with a certified lymphedema therapist and/or physiatrist specializing in lymphedema.

American Venous Forum (AVF)/American Vein and Lymphatic Society (AVLS)/ Society for Vascular Medicine (SVM)

In 2022, the AVF created a work group to develop a consensus statement regarding current practices on the diagnosis and treatment of lymphedema (Lurie et al.). The criteria for consensus panel participation included publications and presentations on lymphedema, participation with a specialty society, and significant representation of lymphedema patients in the expert's clinical practice. Participants included academic, private, and hospital-based practice settings, as well as an international panel of experts. It was acknowledged that there is high variability in lymphedema care among experts in the field. Consensus was reached for the following treatments:
- The regular use of compression garments reduces progression of lymphedema.
- Sequential pneumatic compression (SPC) should be recommended.
- Manual lymphatic Drainage (MLD) should be a mandatory component of the management of patients with lymphedema.

There was no consensus reached regarding surgical treatments.

International Society of Lymphology (ISL)

In a 2020 consensus document, updated in 2023, on the diagnosis and treatment of peripheral lymphedema, the ISL states the following:
- No treatment has undergone rigorous, randomized, stratified, long-term, controlled studies, and there remains some degree of uncertainty, ambiguity, and flexibility along with dissatisfaction with current lymphedema diagnosis and management.
- In carefully selected patients following full evaluation, microsurgical and super microsurgical procedures are an adjunct to CDT or when CDT has clearly been unsuccessful.
- Liposuction, lymphaticovenous anastomosis and lymph node transfer operations coupled with appropriate lymphedema therapy and compression are effective when used to treat properly selected lymphedema patients and performed by an experienced lymphedema surgeon.
- Debulking is mainly for the treatment of the most severe forms of fibrosclerotic lymphedema (elephantiasis) and in cases of advanced genital lymphedema.

- Specialized lymphatic liposuction has been shown to be effective to completely reduce non-pitting extremity lymphedema due to excess fat deposition that does not respond to non-operative therapy in both primary and secondary lymphedema, and should be done by an experienced team that includes surgeons, nurses, occupational therapists, and physiotherapists.

National Institute for Health and Care Excellence (NICE)

In a 2024 NICE interventional procedures guidance document titled *Lymphovenous Anastomosis During Axillary or Inguinal Node Dissection for the Prevention of Secondary Lymphoedema* states that in adults with breast cancer, LVA should only be done with special arrangements for clinical governance, consent and audit or research. More research is needed in the areas of patient selection, quality of life, longer-term outcomes for lymphedema incidence in different conditions, limb volume safety outcomes (including survival and metastatic cancer). More research is also needed on LVA for preventing lymphedema for other cancers.

In a 2022 interventional procedures guidance document, NICE states that the evidence regarding the safety and efficacy of liposuction for chronic lymphedema is adequate and should only be used for patients with lymphedema that has been non-responsive to conventional treatments. Patient selection must be done by a multidisciplinary team that specializes in managing lymphedema and should only be done in specialist centers with training and expertise in this procedure. The procedure is not curative, and effectiveness relies on lifelong wearing of compression garments.

The 2018 NICE guideline on diagnosis and management of early and localized breast cancer was updated in 2025 and now contains a section on the non-pharmacological prevention of lymphedema in individuals who have or have had breast cancer. This guideline states that the evidence supports the use of surgical treatments for lymphoedema prevention for reducing the excess limb volume, decreasing the need for conservative therapy, improving patient quality of life, and improving physical function. While these studies suggest some benefit to immediate lymph venous anastomosis during axillary lymph node dissection (ALND), further research is needed, the committee highlighted that the majority of the evidence was based on lower limb lymphoedema, the small studies that looked at upper limb lymphoedema failed to show efficacy.

American Society of Breast Surgeons (ASBrS)

In a 2022 consensus statement the ASBrS states that newer surgical techniques, such as axillary reverse mapping, lymphatic transfer, and lympho-venous anastomosis are promising both for prevention and for treatment of established lymphedema. However, well-designed prospective studies with uniform criteria for patient selection, procedure, and outcome assessment are needed. In institutions where these techniques are available, they should be considered whenever ALND is required.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

The FDA has approved a number of devices for use for liposuction. Refer to the following website for more information (use product codes MUU): http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm.
(Accessed July 2, 2025)

The FDA has approved a number of near infrared fluorescence imaging systems. Refer to the following website for more information using product codes IZI or device name: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm.
(Accessed July 2, 2025)

Indocyanine green is an FDA approved injectable drug frequently used with near infrared fluorescence imaging systems. Further information can be found at the following website:
https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=040811.
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Policy History/Revision Information

Date	Summary of Changes
05/01/2026	**Applicable Codes** • Updated list of applicable CPT codes to reflect annual edits; added 1019T • Added notation to indicate CPT code 1019T is not on the State of North Carolina Medicaid Fee Schedule and therefore may not be covered by the State of North Carolina Medicaid Program **Supporting Information** • Archived previous policy version CSNCT0355.04

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the federal, state or contractual requirements for benefit plan coverage must be referenced as the terms of the federal, state or contractual requirements for benefit plan coverage may differ from the standard benefit plan. In the event of a conflict, the federal, state or contractual requirements for benefit plan coverage govern. Before using this policy, check the federal, state or contractual requirements for benefit plan coverage. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

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