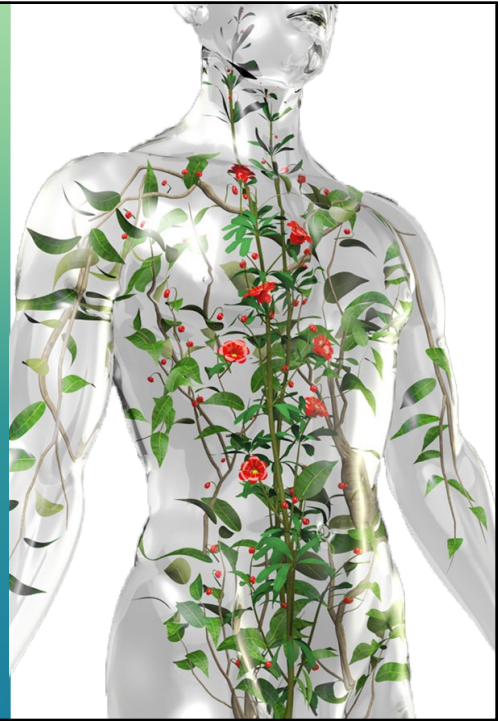


Oncology Massage Healing Summit 2026

Head and Neck Cancer

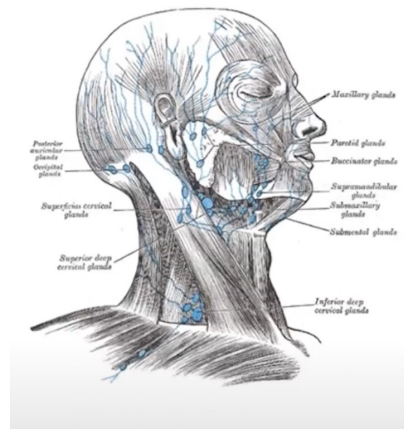
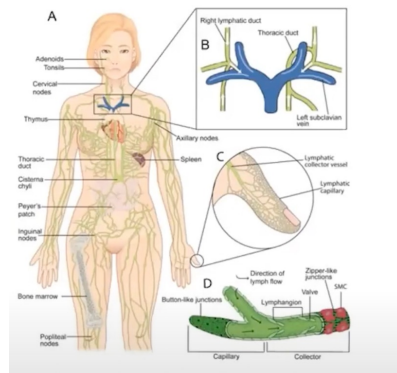
Impact of treatments
on the lymphatic system

Nicola McGill
LLSA, LMT, CLT_LANA



1

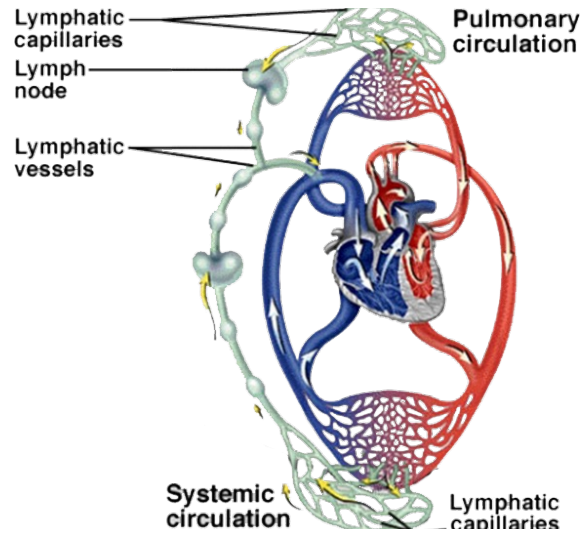
What is the lymphatic system and how does it impact the head and neck cancer patient



2

Functions of the Lymphatic System

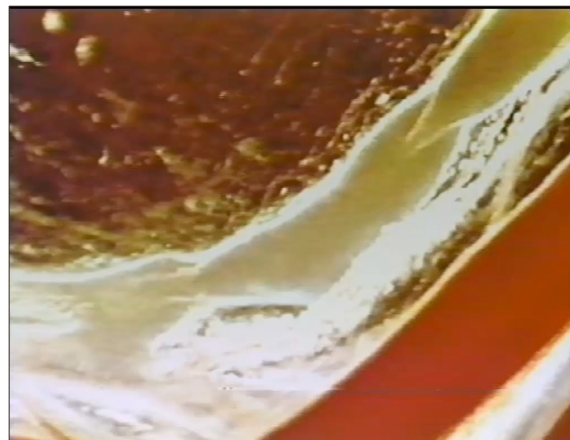
- Prevent edema formation by returning interstitial fluid from the interstitium back to the cardiovascular system
- Plays a key function in the absorption of fats and fat-soluble vitamins from intestinal lymph vessels (lacteals) to produce chyle
- Provides immune surveillance by recognizing and responding to foreign cells (pathogens), cancer cells, viruses..



3

Lymphatic Fluid and Lymphatic Vessels

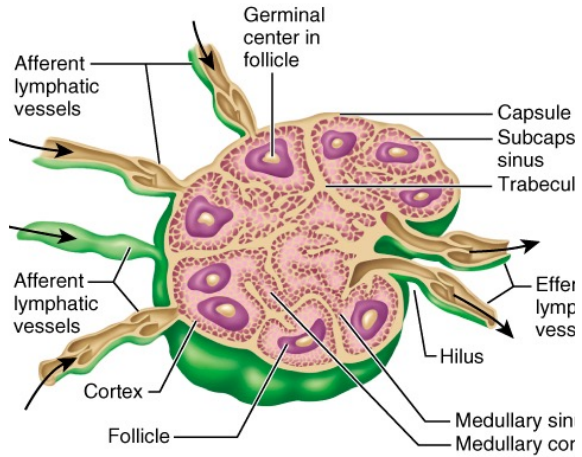
- **Lymphatic fluid**, consists of protein, water, fat and cells. The return of these proteins from the interstitial space back to the cardiovascular system is essential for the human body to survive.
- **Lymph fluid is produced** in small lymph capillaries as a result of net filtration of water through blood capillaries into the interstitium.
- Once a **lymph capillary** is filled it is then transported to a larger lymph vessel called a **collector** which then directs lymph fluid towards **lymph nodes** where the fluid is filtered before continuing to even larger vessels (**lymph trunks**) and eventually back to the **thoracic duct** or **right lymphatic duct** which enter the cardiovascular system at the subclavian veins.



4

Lymph Nodes

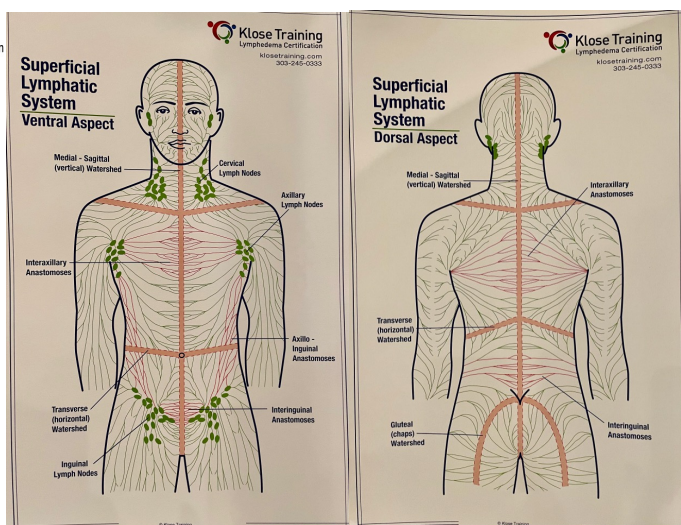
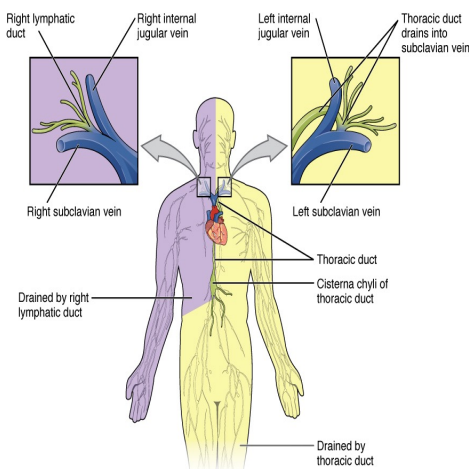
- Serve as filtering stations for lymphatic fluid
- Regulate concentration of protein by absorbing water from the lymphatic fluid
- Storage and production of B lymphocytes
- Approximately 600-700 in body, 300 found in the head and neck region



a)
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Deep Lymphatic Drainage and Lymphatic Watersheds



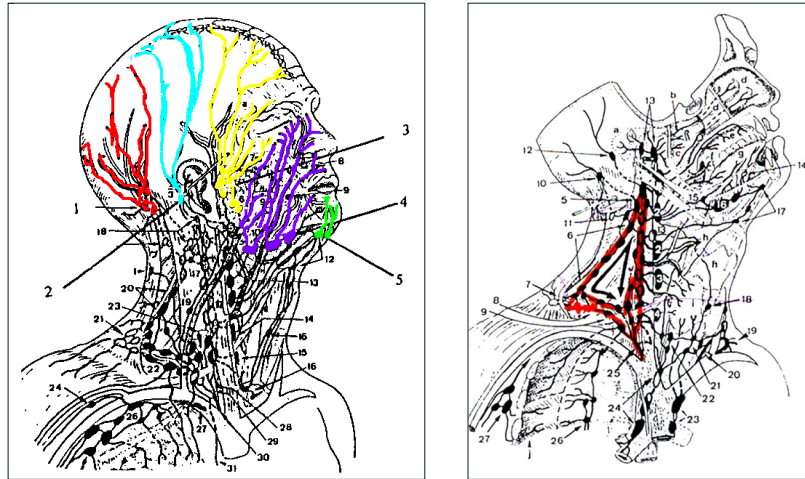
6

Lymphatic Vessels of the Head and Neck

Lymphatic vessels divided into **superficial** and **deep**

Superficial – drain lymph from scalp, face and neck into superficial nodes of the neck at the junction of head and neck

Deep – located at deep cervical lymph nodes, draining directly into the thoracic duct and right lymphatic duct



Modified from Foeldi's Textbook of Lymphology

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Lymph Nodes of the Cervical Region

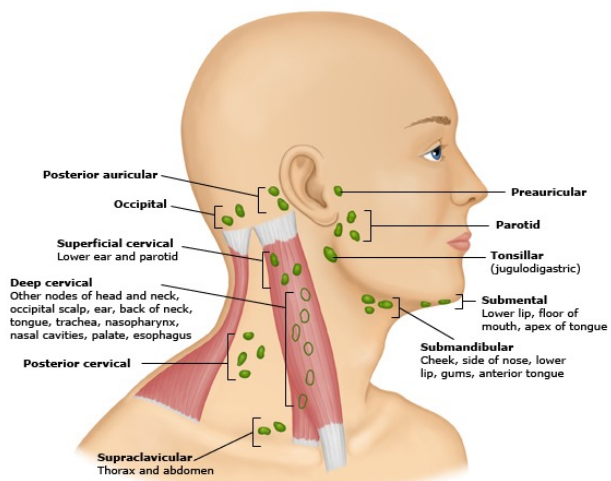
600-700 lymph nodes in entire body – 300 of which in head and neck

Superficial

- Extends from under chin to posterior of head
- Receive lymph from scalp, face and neck, eventually draining into deep lymph nodes
- Gravity supports efficient drainage

Deep

- Lie vertically in a chain along internal jugular vein
- Receives lymph from head and neck directly or via superficial lymph nodes



<https://www.uptodate.com/contents/image/print?imageKey=PI%2F55189>

8

Prevalence of Head and Neck Cancers

2020 Prevalence in the USA

- 4% of all Cancers
- 500,000 survivors
- 65,630 new diagnosis this year
- 48,200 males and 17,430 females
- 95% are Squamous cell carcinoma , impacting mucosal linings

Human Papilloma Virus – Prevalence

- Steady Increase HNC related to HPV
- 16.3% prior to 1999 to 72.7% from 2000
- Patients tend to be younger and more responsive to treatments



Siegel, R. L., K. D. Miller, and A. Jemal. "Cancer Stat 2017; 67 (1), 7–30. doi: 10.3322/caac.21387." (2017).
 Dahiya K, Dhankhar R. Updated overview of current biomarkers in head and neck carcinoma. World J Methodol. 2016 Mar 26;6(1):77-86. doi: 10.5662/wjm.v6.i1.77. PMID: 27018324; PMCID: PMC4804254.

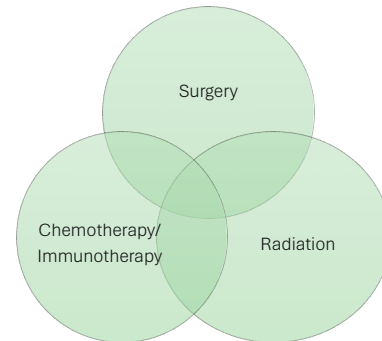
Risk Factors for Head and Neck Cancers

Most people associate head & neck cancer with the use of tobacco products and alcohol, but there are other risk factors too

Products	Chemicals	Others
Smoking tobacco	Asbestos	Ionizing radiation
Chewing tobacco	Chromium	Human papilloma virus
Smoking marijuana	Nickel	Plummer-Vinson
Alcohol	Arsenic	Epstein-Barr virus
	Formaldehyde	
	Ethanol products	

Treatments for Head and Neck Cancers (HNC)

- **Surgery** – Radical, modified or selective neck dissection, reconstructive surgery (pedicle or free flap surgery)
- **Chemotherapy/Immunotherapy** - Systemic, targeted immunotherapy
- **Radiation** – External beam, targeted, brachytherapy, intraoperative



Goal – Complete pathological response

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Treatments for Head and Neck Cancers (HNC)

Surgery

- Radical, modified or selective neck dissection, LN removal

Reconstructive surgery

- **Free flap** – vascularized tissue transferred from distant donor site – forearm/thigh
- **Pedicle flap** – pectoralis major tunneled into the neck area with vasculature so no microsurgery necessary – remodels the anatomy of the neck



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Head and Neck Cancer Treatment -Therapeutic Challenges- Acute and Chronic

- In a surgical radical neck dissection (RND), first described in 1906 to treat metastatic disease, five levels of lymph nodes, the spinal accessory nerve, the external and internal jugular vein, the sternocleidomastoid, and the omohyoid muscle are all removed.
- To minimize dysfunction, a modified RND was introduced in 1960 that preserves some or all of the non-lymphatic structures.
- Selective neck dissection (SND) goes even further by preserving one or more groups of lymph nodes.



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Treatments for Head and Neck Cancers (HNC)

Radiation

- **Proton Therapy** – Directed at tumor site. Protons therapy do not penetrate below the tumor site which decreases the side effects and minimalizes tissue damage. Less impact than photon therapy allowing for a higher dose therapy
- **Stereotactic Body Radiotherapy (SBRT)** – delivers very high dose using IG Guided imagery.
- **Adaptive Radiation Therapy (ART)** – uses imaging feedback loop to accommodate for anatomical changes so modifies treatment accordingly
- **Intensity Modulated Radiation Therapy (IMRT)** – Create the exact beams to exact dimensions of treatment area – CT maps tumor in 3D, PET, CT and MRI generates outline of tumor allowing for a more precise dose of XRT and reduce damage to healthy tissue
- **Brachytherapy** – placement of radioactive material in the form of seeds, pellets – damages the DNA of localized CA cells

Sonke JJ, Aznar M, Rasch C. Adaptive Radiotherapy for Anatomical Changes. Semin Radiat Oncol. 2019 Jul;29(3):24257. doi: 10.1016/j.semradonc.2019.02.007. PMID: 31027642.

14

Treatments for Head and Neck Cancers (HNC)

Chemotherapy/Immunotherapy

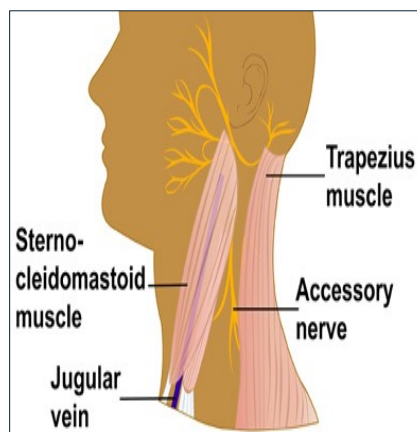
- Cisplatin (Platinol)
- Fluorouracil (Acrucil)
- Methotrexate (Rheumatrex)
- Carboplatin (Abraxane)
- Paclitaxel (Taxol)
- Docetaxel (Taxotere)
- Cetuximab (Erbix)
- Nivolumab (OPDIVO)
- Pembrolizumab (Keytruda)



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Head and Neck Cancer Treatment Therapeutic challenges- Acute and Chronic

- **Lymphedema**
- **Pain**
- Reduced ROM
- Psychosocial Factors -Speech
- Dysphagia (difficulty swallowing)
- Xerostomia – (dry mouth)
- Odynophagia (painful swallowing)
- Trismus (difficulty opening mouth)
- Mucositis
- Loss of Muscle
- Nerve damage
- Others



- The spinal accessory nerve, CN XI, provides motor innervations to the sternocleidomastoid and trapezius muscles.
- Damage to this nerve caused by cancer interventions can negatively impact the sternocleidomastoid muscle and the upper, middle, and lower trapezius muscles resulting in weakness, paralysis, pain, and cosmetic disturbances.

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How Cancer Impacts the Lymphatic System

- Tumor growth can restrict lymph flow
- **Surgery** – Removal of Lymph nodes increases the risk of lymphedema

- **Radiation** – Leads to interstitial fibrosis

Compression of lymph vessels

Mechanical dysfunction of lymph vessel contraction

- **Chemotherapy** – Weaken vessels, impedes lymph flow and possible inflammation

1. Ridner SH, Dietrich MS, Niemann K, Chmelak A, Mannion K, Murphy B. A Prospective Study of the Lymphedema and Fibrosis Continuum in Patients with Head and Neck Cancer. *Lymphatic Res Biol*. 2016 Dec;14(4):198-205.
 2. Chapat G, Ibrahim M, Towers A. Cancer-related lymphedemas: clinical pearls for providers. *Curr Oncol*. 2020;27(6):338-349.
 3. Allam O, et al. The impact of radiation on lymphedema: a review of the literature. Division of Plastic and Reconstructive Surgery, Yale University, New Haven, CT, USA, Dec 24, 2019
 4. Johnson AR, Granoff MD, Lee BT, Padiera TP, Bouta EM, Singhal D. The Impact of Taxane-based Chemotherapy on the Lymphatic System. *Ann Plast Surg*. 2019;82(4S Suppl 3):S173-S178. doi:10.1097/SAP.0000000000001884

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How HNC affects lymphatic function

- Lymphedema is a chronic progressive disease that is caused by the abnormal accumulation of protein rich fluid in the interstitium that can lead to reactive fibrosis and chronic inflammation. It requires early intervention and a chronic care model for long term management. -Think Internal edema
- Build up of protein rich fluid provides a “fertile” breeding ground for bacterial growth.
- Reduced Immune function due to loss/damage of lymph nodes places patient at risk of infections
- **Smith & Lewin (2010)** – Head and Neck Lymphedema can cause: reduced quality of life, impaired communication, visual changes, dysphagia, psychological effects and more
- **Ridner et al. (2016)** - 90% of patients have head and neck lymphedema 1 year post cancer treatment. 75% are moderate/severe. 47% have fibrosis
- **Jeans et al. (2021)** – Internal lymphedema impacts 97% of individuals to some degree. It can impact internal structures/alter internal anatomy

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Location of Lymph Nodes in the Neck

American Academy of Otolaryngology classification of cervical lymph nodes

- Corresponds to drainage of the tumors
- Lymph nodes removed during tumor removal are based on patterns of metastases that are predictable relative to primary site of disease

Level I: **Ia:** submental, **Ib:** submandibular

Level II: upper internal jugular (deep cervical) chain

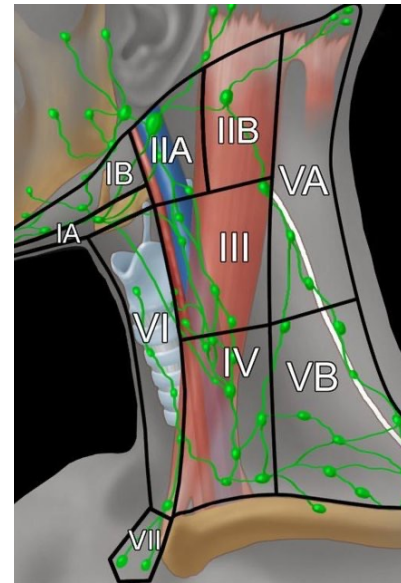
Level III: middle internal jugular (deep cervical) chain

Level IV: lower internal jugular (deep cervical) chain

Level V: **Va:** supraclavicular/**Vb:** spinal accessory

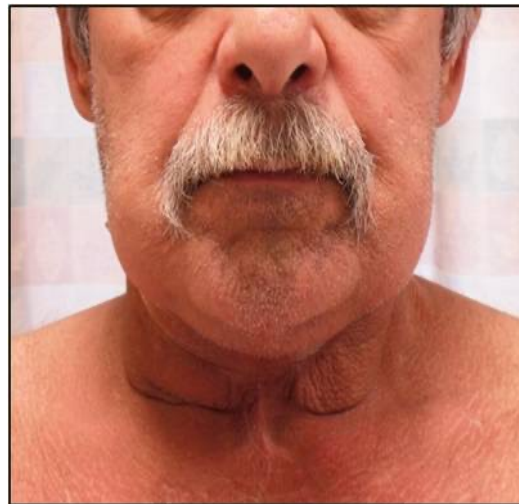
Level VI: central (anterior) compartment

Level VII: anterior superior mediastinum and tracheoesophageal groove



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Head and Neck Lymphedema



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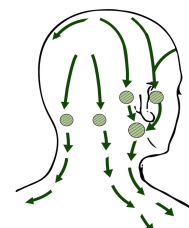
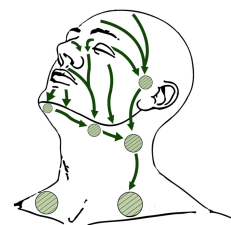
Treatment for Head and Neck Lymphedema

Please note that any client presenting with lymphedema should always be seen by a certified lymphedema therapist (CLT) as the treatment requires specialized training in all areas of lymphedema management including compression bandaging, skin care management and specific MLD techniques that address the individual's symptoms.

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HNC Treatment Considerations

- Edema can be managed with MLD, though be aware that the collateral lymphatic (venous) pathways will be limited.
- Be careful applying MLD over irradiated skin. - Wait at least 6-8 weeks post radiation
- Do not use thermal modalities on irradiated skin and observe graft precautions.
- Be sensitive to how radiation and chemotherapy can affect the patient.
- The patient is likely to be hypersensitive to touch or experience numbness in the affected area.



Normal pathways used on the face, anterior neck, and posterior head/neck MLD sequence - This requires adaptation for HNC clients

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HNC treatment considerations

Scar Management - Role of a Lymphedema Therapist

1. In addition to diminished cosmesis, scars can cause physical disruption by obstructing lymphatic drainage and restricting cervical ROM.
2. One of the key components of treatment must be scar management.
3. Treatment should also facilitate the use of larger lymph-node groups for primary drainage.
4. Scars or tissue with radiation induced fibrosis can be carefully manipulated after they are well healed. Scars can be made more mobile

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Additional Treatment Techniques

Myofascial release

Instrument assisted soft tissue mobilizations (ASTM)

Trigger Point release

Kinesio tape applications

Low level lasers

Lymphatouch – negative pressure mechanical vibration

Hyperbaric oxygen chamber (HBOT)

Multi modal approach with interdisciplinary collaboration are essential to recovery and QOL for this patient population...

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How can a massage therapist help this client population

Questions to ask your client

- Changes in sensation
- Pain
- Globus
- Difficulty swallowing
- Change in voice - quality/pitch/volume
- Mastication/chewing
- Other symptoms

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How can a massage therapist help this client population

MT's work can be influential in supporting the clients relaxation with Oncology Massage and subtle Aromatherapy

Provide MLD (if trained as CMLDT) to healthy tissue regions and work alongside a CLT

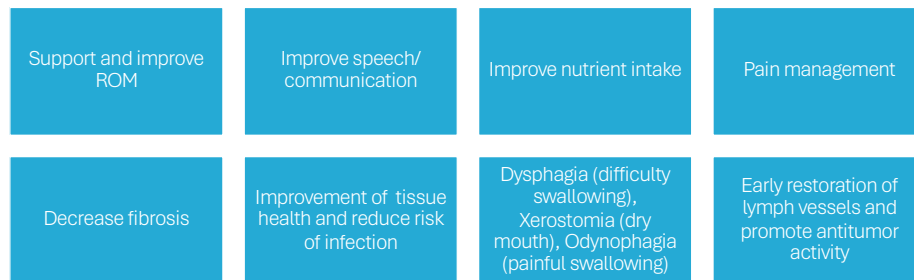
Incorporate abdominal breathing techniques to stimulate deeper lymphatic drainage

Encourage clients to sleep on the healthy side – aiding muscle relaxation – a point to consider when client is receiving a treatment from MT

Provide awareness to the client of tissue changes

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Benefits of Manual Lymphatic Drainage for HNC Patients



Aldrich MB, Rasmussen JC, Fife CE, Shaitelman SF, Sevick-Muraca EM. The Development and Treatment of Lymphatic Dysfunction in Cancer Patients and Survivors. *Cancers (Basel)*. 2020 Aug 14;12(8):2280. doi: 10.3390/cancers12082280. PMID: 32823928; PMCID: PMC7466081.

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Considerations when applying MLD/Massage

- Correct elevation of the client's head at home and in clinic
- Incorporate abdominal breathing techniques to stimulate deeper lymphatic drainage and aid relaxation
- Work below indurated tissue - SCF and shoulders down to the axilla
- Posterior work in a side-lying position or elevation
- Posterior neck if skin is intact
- Incorporate trapezius MFR
- Avoid cervical lymph nodes due to XRT
- Avoid place of contracture
- Remember wounds take time to heal, sometimes not healing at all
- XRT fibrosis is different to general fibrosis

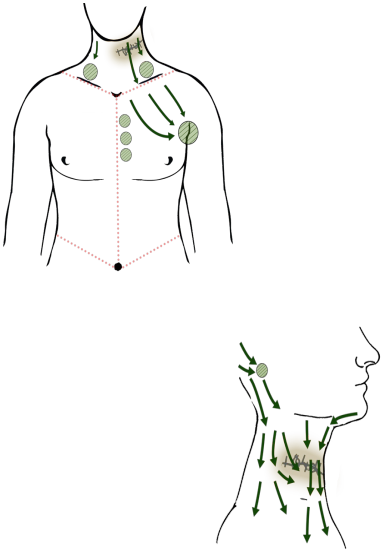


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MLD Drainage Pathways for Head and Neck Lymphedema

Patient supine /reclined

- Treat Axillary Lymph nodes on affected side
- Treat upper chest with stationary circles in the direction of axillary lymph nodes
- Treat SCF bilaterally
- Treat posterior neck (occipital lymph nodes) as applicable



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McGILL

Thank You

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Nicola McGill, LLSA, LMT, CLT-LANA

www.nicolamcgill.com

aroma@nicolamcgill.com

www.klosetraining.com/mlid

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