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Dysphagia Management in Head and Neck Cancer

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Dysphagia Management in Head and Neck Cancer

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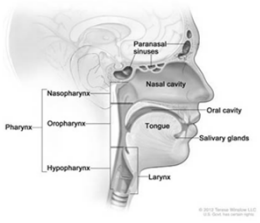
Learning Objectives

After this course, participants will be able to:

- Describe risk factors, signs and symptoms, and staging of head and neck cancer.
- List treatment options for head and neck cancer.
- Describe swallow evaluation and treatment procedures for patients before, during, and after treatment for head and neck cancer.
- List strategies for implementing prophylactic dysphagia therapy for patients undergoing chemoradiation for head and neck cancer.
- Describe management methods for the swallow-related side effects of treatment.

Head and Neck Cancer Estimated Statistics for 2015

- Accounts for 3% of all cancers in US
  - 6th most common cancer worldwide
- 59,340 people
  - 43,390 men
  - 15,950 women
- 12,290 US deaths will occur
- Most commonly Squamous Cell Carcinoma



cancer.net, cancer.gov

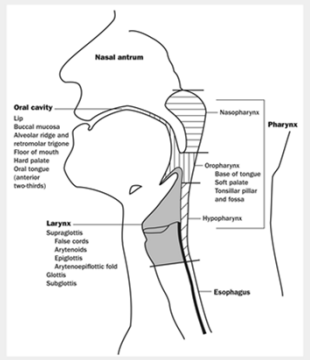


FIGURE 1: Anatomic sites and subsites of the head and neck. The approximate distribution of head and neck cancer is oral cavity, 44%; larynx, 31%; and pharynx, 25%.

www.cancernetwork.com

What is Cancer?

- Begins as a cluster of cells multiplying out of control
- When the immune system can no longer resist the growth, local growth takes place
- Then the cells can penetrate into blood vessels and lymph vessel walls
- Metastasis- spread beyond original location:

TNM Staging System of the American Joint Committee on Cancer (AJCC)

T = Tumor (1-4) based on size of tumor, varies by site

N = Nodes (0-3) based on location and size of nodes

M = Metastasis (x-1)

TNM stage is then combined into a grouping to assign an overall stage of 0, I, II, III, or IV

Early Stage = Better survival

Oral Cavity Staging

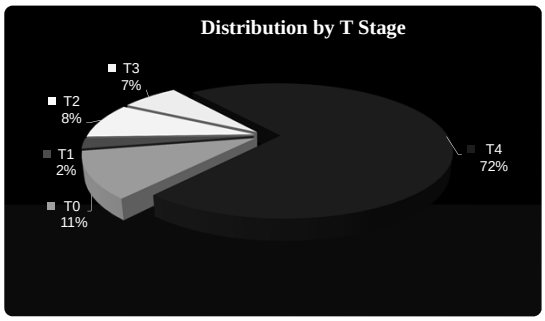
Primary Tumor (T)

TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma *in situ*
T1	Tumor 2 cm or less in greatest dimension
T2	Tumor more than 2 cm but not more than 4 cm in greatest dimension
T3	Tumor more than 4 cm in greatest dimension
T4	(Lip) Tumor invades through cortical bone, inferior alveolar nerve, floor of mouth, or skin of face, i.e., chin or nose[1]
T4a	(Oral Cavity) Tumor invades through cortical bone, into deep [extrinsic] muscle of tongue (genioglossus, hyoglossus, palatoglossus, and styloglossus), maxillary sinus, or skin of face
T4b	Tumor involves masticator space, pterygoid plates, or skull base and/or encases internal carotid artery

Notes

1. Superficial erosion alone of bone/tooth socket by gingival primary is not sufficient to classify as T4.

AJCC Cancer staging manual, 7th edition.



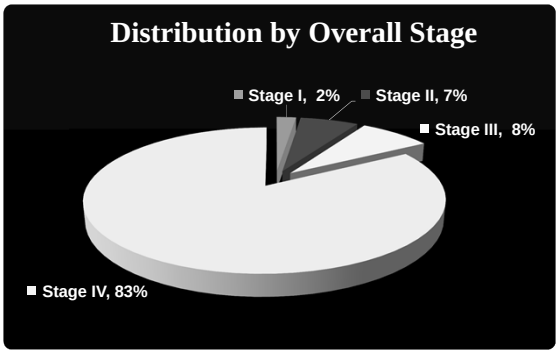
Courtesy of J. Trad Wadsworth, MD

Nodal staging

Regional Lymph Nodes (N)

NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension
N2	Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension; or in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension; or in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N2a	Metastasis in single ipsilateral lymph node more than 3 cm but not more than 6 cm in greatest dimension
N2b	Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension
N2c	Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N3	Metastasis in a lymph node more than 6 cm in greatest dimension

AJCC Cancer staging manual, 7th edition.



Courtesy of J. Trad Wadsworth, MD

T3N2aM0 SCCA of the BOT

- What does that mean?
  - T3- > 4.1 cm
  - N2a- Single ipsilateral lymph node 3-6 cm in size
  - M0- No distant metastasis
  - Stage IV cancer because it has spread to surrounding lymph nodes

Risk Factors for Head and Neck Cancer

- Tobacco use
- Frequent heavy consumption of alcohol
- HPV (oropharyngeal)
- Sun exposure
- Epstein Barr Virus (nasopharyngeal)
- Occupation exposure
- Radiation exposure
- Betel nut
- Marijuana use
- GERD
- Poor nutrition and oral hygiene
- Weakened immune system
- Ancestry
- Gender
- Age (over 40)

cancer.net, cancer.gov

HPV

- Oropharyngeal carcinomas increased by 225% between 1988 and 2004
- Nearly 70% of new oropharyngeal cancers linked to HPV
- HPV Negative cancers
  - associated with tobacco and alcohol
  - Decreasing with decreased tobacco use
  - decreased survival
- HPV Positive cancers
  - Associated with increasing oral sex, more than 7 sexual partners, early age of sexual behavior, premarital
  - Increasing in incidence
  - Associated with increased survival

Chaturvedi 2011

Signs and Symptoms

- Sore in mouth that does not heal
- Red or white patch in the mouth
- Lump, bump, or mass in the neck
- Persistent sore throat
- Chronic halitosis
- Change in voice
- Nasal obstruction or persistent nasal congestion or nose bleeds
- Pain or difficulty chewing or swallowing
- Ear and/or jaw pain
- Loosening of teeth
- Dentures that no longer fit
- Unexplained weight loss
- Fatigue

www.headandneck.org

Multidisciplinary Team- Tumor Board

- Head and Neck Surgeon
- Radiation Oncologist
- Hematology Oncologist
- Radiologist
- Pathologist
- Dentist/Prosthodontist
- SLP
- Nutritionist
- Nursing
- PT, OT
- Social Services

Treatment Options Depend on Stage and Site of Disease but May Include

- Surgery alone
- Radiation alone
- Surgery Followed by Radiation Therapy (adjuvant)
- Chemotherapy and Radiation (CRT)

Types of Surgery

- TORS
- Resection with Primary Closure
- Resection with Local Closure
  - Tongue flap, buccal flap
- Resection with Regional Closure
  - PMC flap, SCM flap,
- Resection with Free Flap Reconstruction
  - RFFF, FFF, ALT, Scapula, etc.

Oral and Oropharyngeal Cancer

Laryngeal and Hypopharyngeal Cancer

- Laser surgery
- Robotic surgery
- Partial horizontal procedures
- Partial Vertical procedures
- Supracricoid laryngectomy
- Total laryngectomy
- Laryngopharyngectomy

Preservation of Form ≠ Preservation of Function

- Dysphagia is one of the major toxicities of organ preservation protocols for Head and Neck cancer.
  - Aspiration post treatment (23%-78%)
  - Feeding tube dependence (12%-64% at one year)
  - Decreased quality of life (persists for 12+ months)

Lissette van der Molen,et al, 2008, Reiger et al, 2006

Why?

- How does radiation affect swallowing?
- How does chemotherapy affect swallowing?
- What are the long-term effects of treatment?
- What can we do to manage side effect and eliminate long term deficits?
- Can therapy during and after treatment help prevent dysphagia and promote swallow related quality of life?

Radiation Therapy

- Provides small doses of radiation over a long period of time to destroy cancer cells while allowing the normal adjacent cells to repair from the injury.
- Treatment:
  - Once a day 5 times a week
  - Usually lasts 5-7 weeks
  - Each treatment takes approx. 10 minutes and is painless

External Beam Radiation

- Three dimensional conformal radiotherapy (3D CRT) combines multiple radiation fields to deliver precise doses to target area
- Intensity Modulated Radiation Therapy (IMRT) a form of 3D RT that limits surrounding tissue exposure by modifying intensity of each radiation beam

XRT Terminology

- Dose expressed in "Gray or Centigray"
  - 1 Rad = 1 cGy
  - 100 cGy = 1 Gy
  - Typical dose for head and neck cancer
    - 900 – 1000 units per week
    - 180-200 units per day
    - Total dose usually 6000-7400 cGy (60-74Gy)

Chemotherapy:

- Systemic medication to treat metastatic disease
- Usually given via IV but may be oral
- Targets most rapidly dividing cells in body including:
  - Cancer cells
  - Cells of gastrointestinal tract
  - Bone marrow
  - Hair cells
  - Cisplatin, Carbo-taxol, Biologic Agents- Erbitux
  - Chemotherapy when added to XRT heightens the effect of the treatment and also heightens the side effects

Disorders Affecting Oral Stage of Swallowing During and After XRT/CRT

- Xerostomia
- Mucositis
- Dysgeusia
- Odynophagia
- Reduced oral sensation
- ORN
- Trismus
- Reduced strength and/or ROM of lips, tongue, or jaw
- Decreased appetite
- Edema
- Fibrosis
- Neuropathy
- Atrophy

Mucostis- painful ulceration and inflammation of the mucous membranes of the intestinal tract

- Very painful
- Neutralizing/soothing rinse- ½ tsp salt and 2tsp baking soda in 4 cups of water
- ½ tsp baking soda in 8 oz of water
- Can be treated by MD with pain control meds or topical anesthetics
  - Magic Mouthwash
  - Viscous lidocaine
  - Caphasol

Xerostomia- dry mouth due to decreased salivary flow

Signs :

- Thick stringy secretions
- Increased thirst
- Altered taste
- Burning in mouth
- Cuts/Cracks in lips and tongue
- Changes in the surface of the tongue

Side effects of xerostomia

- Tooth decay
- Infection
  - Bacterial
  - Fungal
- Gum disease
- Oral and Pharyngeal stage dysphagia
- Difficulty articulating
- Vocal deterioration

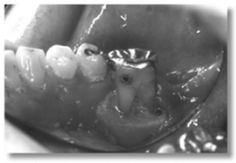
Management of Xerostomia

- Drink water
- Humidify air
- Use saliva substitutes (sprays, gels, lozenges)
- Baking soda rinse
- Sugar free gum and candy
- Club soda
- Prescription medication (Pilocarpine)

www.drymouth.org

Dental Care

- See dentist before beginning treatment
- Use daily fluoride treatments as prescribed
- Brush with extra soft toothbrush 3x/day
- Use alcohol free rinses
- Floss gently once a day
- Keep lips moist
- Lifelong risk post treatment



Osteoradionecrosis involving the mandible

www.intelligentdental.com

Disorders of Pharyngeal Stage Resulting from XRT/CRT

- Delayed swallow reflex
- Decreased elevation of soft palate
- Reduced strength and posterior motion of base of tongue
- Reduction of pharyngeal contraction
- Reduced epiglottic inversion
- Reduced hyolaryngeal excursion
- Reduced closure of airway entrance
- Reduced laryngeal and pharyngeal sensation
- Cricopharyngeal dysfunction
- Increased pharyngeal transit time
- Edema, Mucositis
- Atrophy
- Fibrosis
- Neuropathy

Lazaarus 1996, Pauloski 1998
Logemann 2008

Video 1

Post-XRT MBS

Video 2

Disorders of Esophageal Stage Resulting from CRT

- Decreased hyo-laryngeal excursion to open CP segment
- Decreased relaxation of CP segment
- Poor pressure to drive bolus through the CP segment
- Esophageal stricture
- GERD
- Dysmotility

Video 3

Early Post XRT FEES

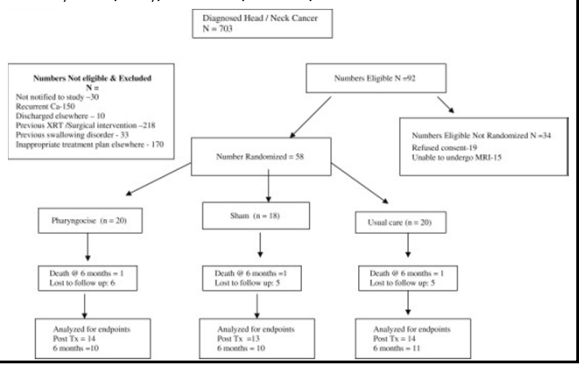
Role of SLP Before XRT

- Establish swallowing/nutritional baseline
- Implement MBS or FEES if indicated
- Discuss normal anatomy and physiology of the swallow
- Review CRT side effects
- Establish oral/dental hygiene program
- Family education and support throughout treatment
- Initiate prophylactic dysphagia exercise protocol

Prophylactic Swallowing Therapy

- Kraaijenga, et al 2014
- Carnaby-Mann, et al, 2012
- Kotz et al., 2012
- Van der Molen et al., 2009, 2011
- Bhayani, et 2012
- Carroll et al., 2008
- Kulbersh et al., 2006

"Pharyngocise": Randomized Controlled Trial of Preventative Exercises to Maintain Muscle Structure and Swallowing Function During Head-and-Neck Chemoradiotherapy
Carnaby-Mann, Crary, Schmalfuss, & Amdur, 2012



Primary outcome measures
(6 weeks and 6 months)

- Muscle size, composition, and T_2 reaction time determined by T_2-weighted magnetic resonance imaging
  - Mylohyoid
  - Genioglossus
  - Hyoglossus
  - Pharyngeal constrictors

Results

- All muscle groups studied deteriorated muscle with treatment
- Greater preservation and less structural deterioration in pharyngocize group
  - Genioglossus
  - Hyoglossuss
  - Mylohyoid

Secondary Outcomes at 6 weeks

Outcome	Usual Care	Pharyngocise
Normal diet (FOIS)	2/14	5/12*
Nonoral feeding	6/14	3/13*
Functional swallowing (MBS)	2/14	6/12*
Weight loss (>10%)	6/13*	4/14
Any complication	7/14	5/12*

Gastrostomy tube placement in patients with oropharyngeal carcinoma treated with XRT or CRT: Factors affecting placement and dependence.
Bhayani, et al, Head and Neck 2012

- Retrospective analysis of 474 oropharyngeal cancer patients treated with XRT or CRT (2003-2008)
- PEG placement and dependence (> 6 mo) evaluated in relation
  - Site
  - T stage
  - Baseline swallow function
  - Weight
  - Smoking
  - Adherence to dysphagia exercises

Subsite	T Classification	PEG Placed	Timing of PEG
Tongue base 247	T1 92	Yes 293 (61%)	Before RT 11%
Tonsil 187	T2 173	No 181 (38.2%)	During RT 81%
Soft Palate 38	T3 118		After RT 7.2%
PPW 2	T4 92		

One patient required a break in treatment for PEG placement

- Almost 40% of patients did not require G-Tube placement
- Factors that predispose to g-tube placement
  - T3 to T4 tumors
  - concurrent chemotherapy
  - 3D conformal or concomitant boost doses
  - current smoking status
  - baseline swallowing dysfunction
  - weight loss
- **Adherence to an aggressive swallowing regimen may reduce long-term dependence on enteral nutrition and limit the rate of g-tube placement**

Gastrostomy tube (g-tube) placement is significantly reduced in patients who report adherence to swallowing exercises.

Length of g-tube dependence is significantly decreased in patients who report adherence to swallowing exercise regimen.

Prophylactic PEG Placement

Benefits

- Nutritional support
- Improved Hydration
- Reduced weight loss
- Decrease treatment interruptions
- More comfortable than rescue NGT

Risks

- Long term dependence
- Complications

- **Prolonged periods of NPO during treatment →**
  - **Muscle atrophy**
  - **Fibrosis**
  - **Stricture**

Mekhail, 2001; Gillespie, 2004

To PEG or Not to PEG?

- Baseline dysphagia?
- Weight loss of more than 10% of body weight?
- Site of lesion?
- Compliance/motivation to participate in dysphagia therapy
- **Comprehensive swallow evaluation prior to treatment can guide in that decision making.**

Prophylactic Therapy Requires a Team

- Referral Sources
  - Otolaryngology
  - Radiation Oncology
  - Hematology Oncology
  - Oral Surgery
  - Nursing staff
- Team communication
  - Tumor board
  - Rounds
- Support services
  - Nutrition services
  - PT/Lymphedema
  - Dentist

When counseling a new patient:

- Stress the importance of continued PO throughout treatment even if painful
- Must swallow everyday, even if PEG is placed
- Educate about the signs and symptoms of dysphagia and aspiration
- Establish a daily routine including oral hygiene and swallowing exercises

Emory - Oral Hygiene Protocol

- Rinse hourly with baking soda rinse
- Use magic mouthwash up to 4x/day - 10 minutes before meals if needed
- Drink water throughout day
- Use salivary substitutes as needed
- Avoid spicy and acidic foods
- Avoid caffeine and alcohol
- Eat a diet of soft, moist, bland foods
- Brush teeth after every meal
- Use fluoride trays as prescribed by dentist
- DO NOT SMOKE

Emory - Daily Swallowing Exercises Prescribed During CRT

- Tongue Press
- Falsetto
- Effortful Swallow
- Tongue Hold
- Jaw ROM and Resistance
- Tongue Base Stretch
- Maintain PO throughout treatment

Video 4

Tongue Press

- "Push entire tongue against palate and squeeze"
- Engagement of submental muscle group contributes to:
  - Hyoid elevation
  - Hyoid anterior motion
  - Laryngeal elevation and closure
  - Opening of UES
  - Tongue base strength, range and flexibility

Yoshida, 2007

Video 5

Falsetto (Effortful Pitch Glide)

- "Glide up in pitch and hold the high pitch"
- Contracts pharyngeal musculature
- Raises hyolaryngeal complex
- Contracts/retracts the tongue base

Miloro 2012 ASHA presentation

Effortful Swallow

- "Swallow as hard as you can"
- Increases tongue base retraction
- Increases hyoid elevation
- Increases pharyngeal pressure generation and UES opening duration

Hind 2001, Hiss 2005

Video 6

Tongue Hold

- "Put your tongue between your teeth and swallow in that position"
  - Increases pharyngeal wall excursion May improve tongue base strength and flexibility

Fujii 2006

Range of Motion Exercises

- Jaw
  - Opening
  - Lateralization
  - Assisted if > 30 mm
- Tongue
  - Extension
  - Lateralization
  - Elevation
  - Retraction

Dynasplint, Therabite

Intervention During XRT

- Review information from initial consult
- Re-evaluate swallow function
- Practice prophylactic swallowing exercises
- Continue to reinforce the oral hygiene
- Implement use of saliva substitutes, topical anesthetics, and oral hydration products as needed
- Implement instrumental swallow assessment as indicated
- Implement therapeutic strategies as indicated
- Alert MD of any issues

Intervention After Completion of CRT

- Re-evaluate swallow function post treatment
- Maintain swallow safety
- If esophageal dysphagia evident, refer for medical intervention
- Establish Maintenance program
- Advance diet as tolerated
- Assist in weaning from tube feeds
- Promote swallow related QOL
- Recognize signs of dysphagia
- Implement maintenance program for long term

Video 7

Late Radiation Associated Dysphagia

- Muscle Fibrosis
- Cranial Neuropathy
- Dysarthria
- Dysphonia/VPI
- Trismus
- ORN
- Stricures/stenosis
- Aspiration/Pneumonia
- Typically not responsive to therapy
- May progress over time
- Implement compensatory strategies
- Diet Modifications

Hutcheson, KA et al., 2012

Proactive Approach to Dysphagia

- Can guide team decision regarding placement of PEG tube.
- Can help prevent long term PEG tube dependence.
- Assists in minimizing complications during treatment.
- Empower patient to be proactive and give focus during treatment.
- Promote improved swallowing outcomes and swallow related QOL.
- Allows SLP to be involved in treatment planning from the beginning.
- Promotes team communication and support.

EMORY

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Thank you!

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