



## Mr Yoon Wai Lam

- Director & Senior Principal Speech Therapist of Speech Therapy Works
- Invited lecturer at NUS MSc SLP ( Singapore )
- Inventor of CTAR swallowing exercise
- Reviewer of Dysphagia Journal

# Stay Home & Go Live with us

**TITLE :** Speech , Swallowing & Hearing Difficulties in Nasopharyngeal Cancer Before, During or After Radiotherapy.

Why and How to Manage?

**DATE :** 22.07.2020, Wednesday

**TIME :** 8 pm

# Speech & Swallowing Difficulties in Nasopharyngeal Cancer Before, During or After Radiotherapy. Why and How to Manage?

**Yoon Wai Lam**

**Senior Principal Speech Therapist**

Speech Therapy



# About me

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# To find out more about CTAR

- Visit my blog:  
<https://dysphagia.sg/2020/05/31/dysphagia-swallowing-therapy-chin-tuck-against-resistance-ctar-with-rubber-ball/>

Or

- Scan this QR code:





# Global Dysphagia Movement

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## Countries:

- Singapore
- Malaysia
- Japan
- USA
- Taiwan
- India
- Bangladesh
- Pakistan
- Philippine



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# Outline:

- What is nasopharyngeal cancer?
- Understanding the normal speech and swallowing process
- Why speech and/or swallowing difficulties might develop before / during / after radiotherapy in NPC? What can be done?
- Hearing loss in patients with NPC by Mr Liew
- How do Speech Therapists manage speech and swallowing difficulties in patients with NPC?
- Can speech and swallowing function be preserved after radiotherapy?

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# WHAT IS NASOPHARYNGEAL CANCER (NPC)?

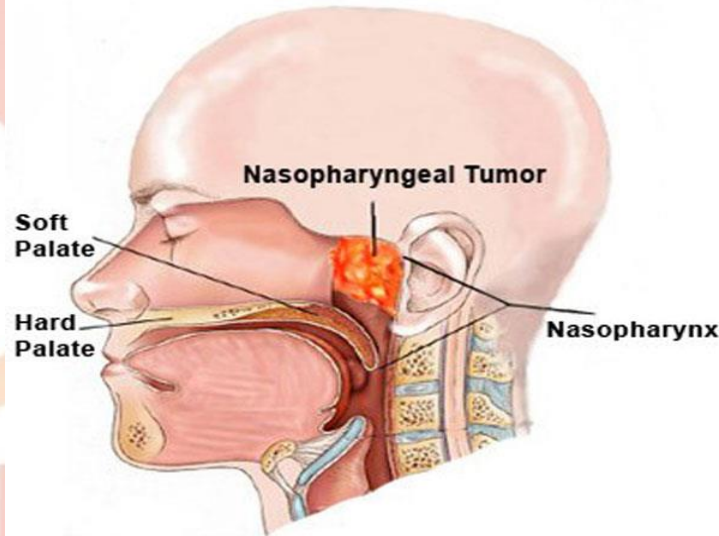
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# What is NPC?

- NPC refers to cancer at the back of the throat behind the nose.
- Signs of nasopharyngeal cancer include trouble breathing, speaking, or hearing.



<https://www.theborneopost.com/2017/10/29/time-is-of-the-essence-in-treating-nasopharyngeal-cancer/>

# Treatment for NPC

- Three types of standard treatment are used:
  - Radiation therapy
  - Chemotherapy
  - Surgery

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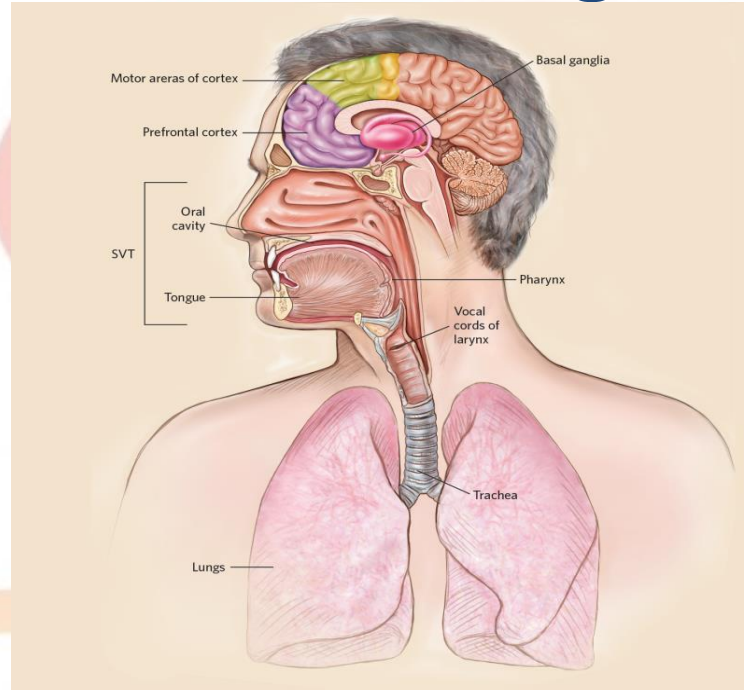
# Understanding the normal speech and swallowing process

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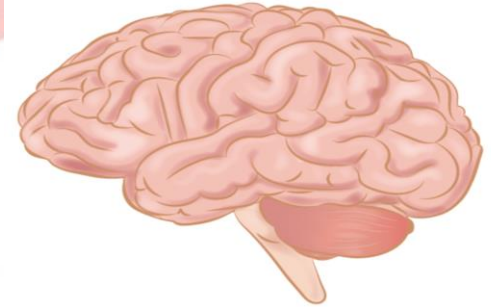
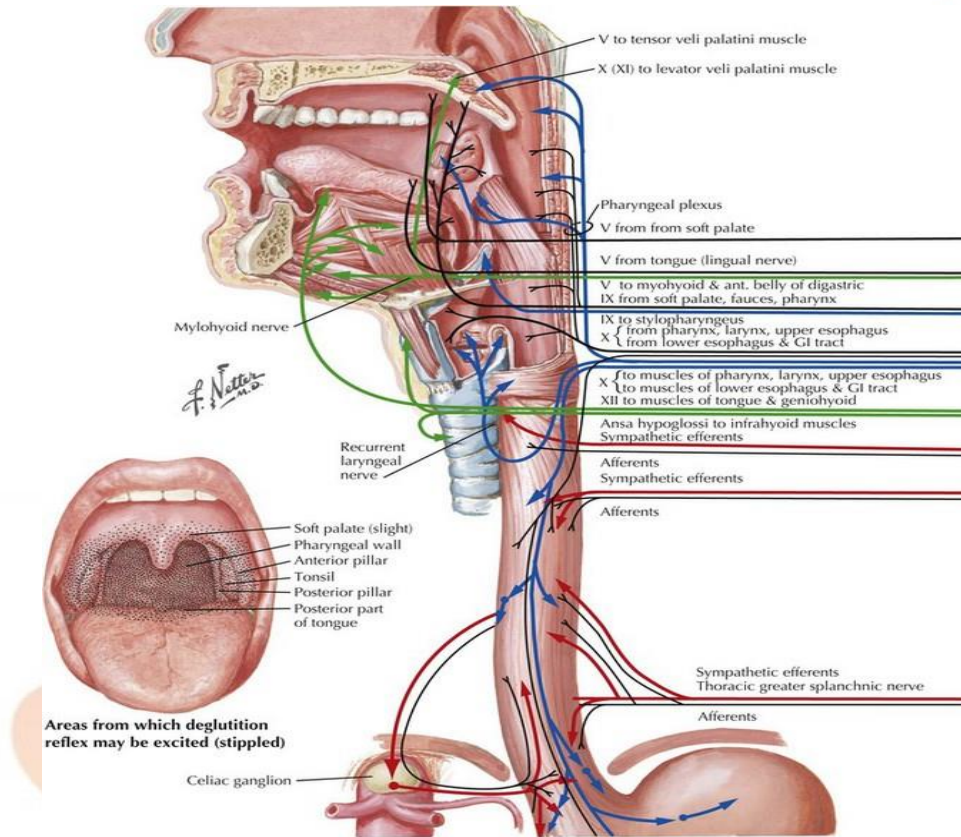
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# Structures important for speech and swallowing



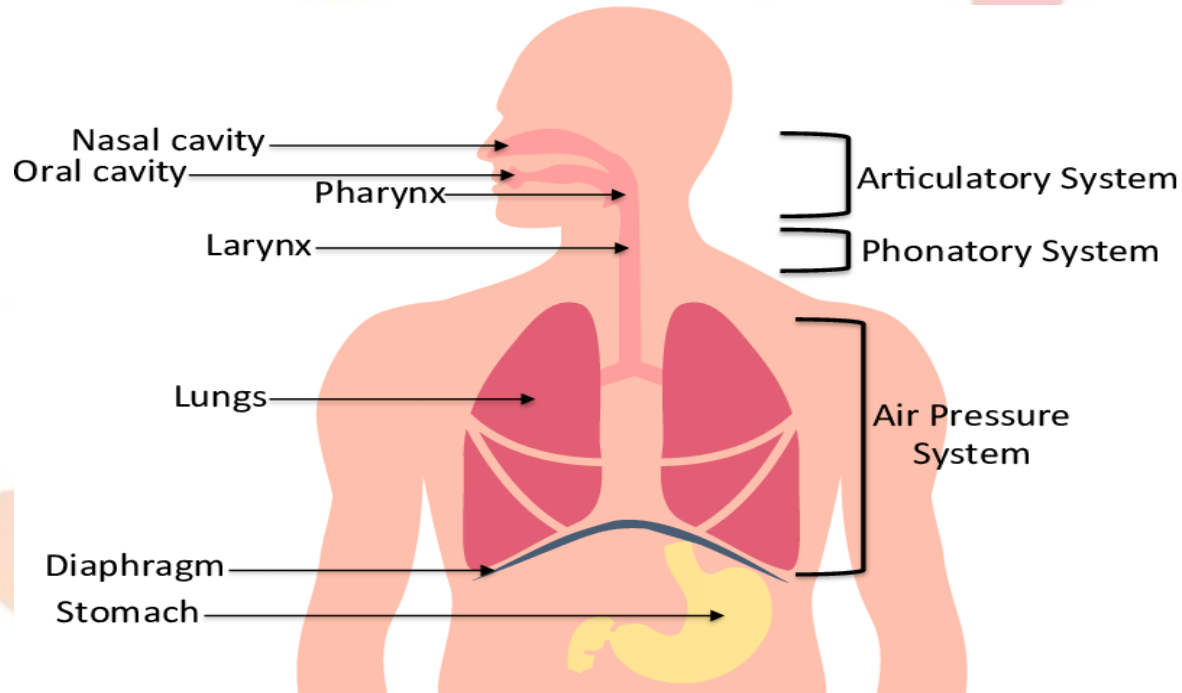
<https://www.the-scientist.com/features/why-human-speech-is-special--64351>



# Brain

<https://clinicalgate.com/cranial-nerves-ix-and-x/>

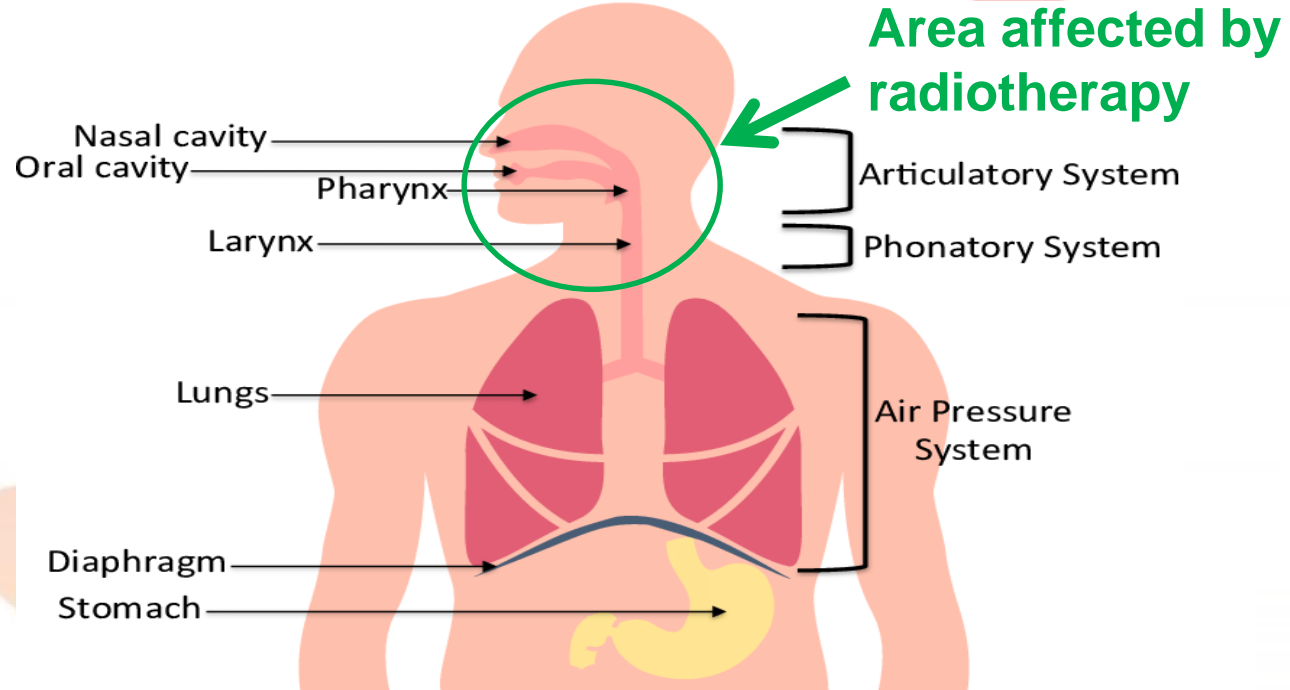
# How speech is produced?



[https://www.researchgate.net/figure/General-scheme-of-the-voice-production-apparatus-Adapted-from-Freepik-2016\\_fig1\\_318814563](https://www.researchgate.net/figure/General-scheme-of-the-voice-production-apparatus-Adapted-from-Freepik-2016_fig1_318814563)



# How speech is produced?



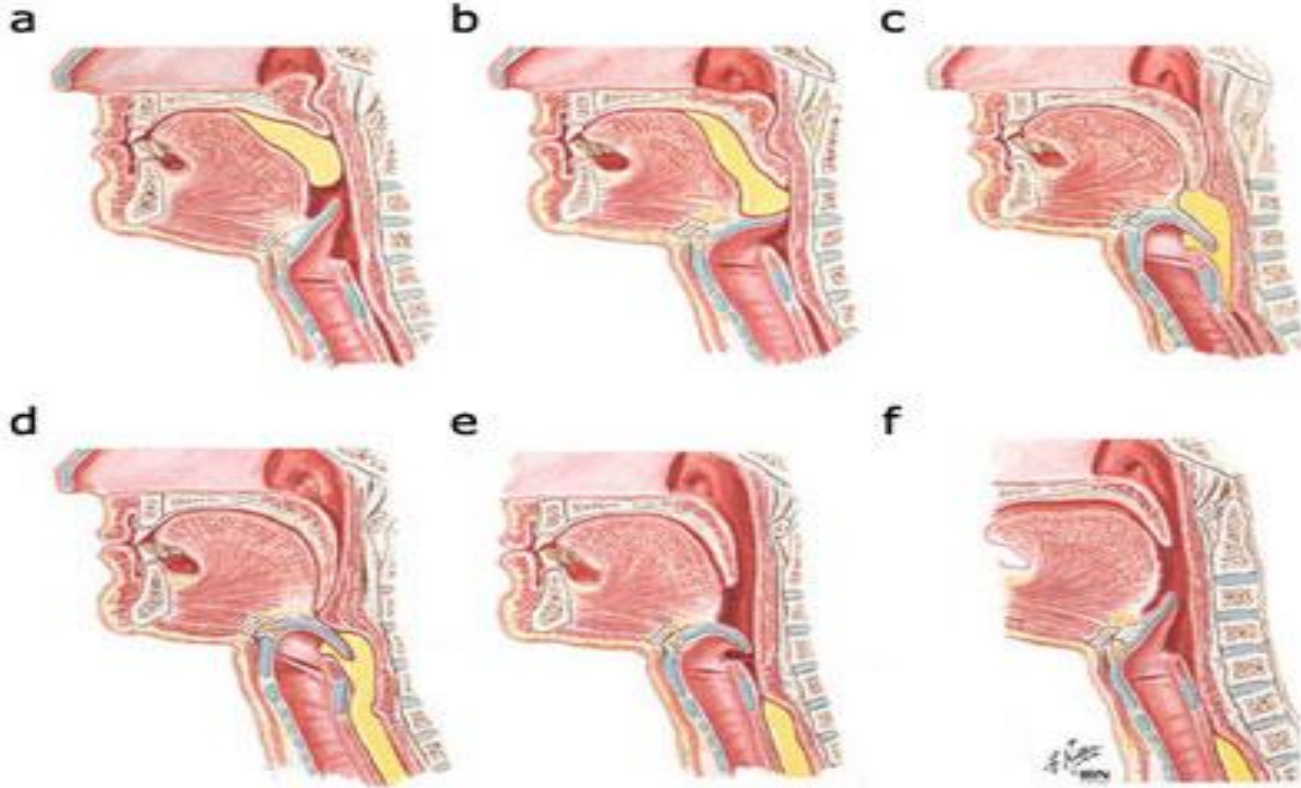
[https://www.researchgate.net/figure/General-scheme-of-the-voice-production-apparatus-Adapted-from-Freepik-2016\\_fig1\\_318814563](https://www.researchgate.net/figure/General-scheme-of-the-voice-production-apparatus-Adapted-from-Freepik-2016_fig1_318814563)

# How do we swallow?

## Swallowing

- Is controlled by the brain
- Involves **50 pairs** of muscles
- Involves **5 pairs** of cranial nerves
- 2 types:
  - **Automatic** swallowing
  - **Conscious** swallowing

# Normal swallowing



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# Video on swallowing



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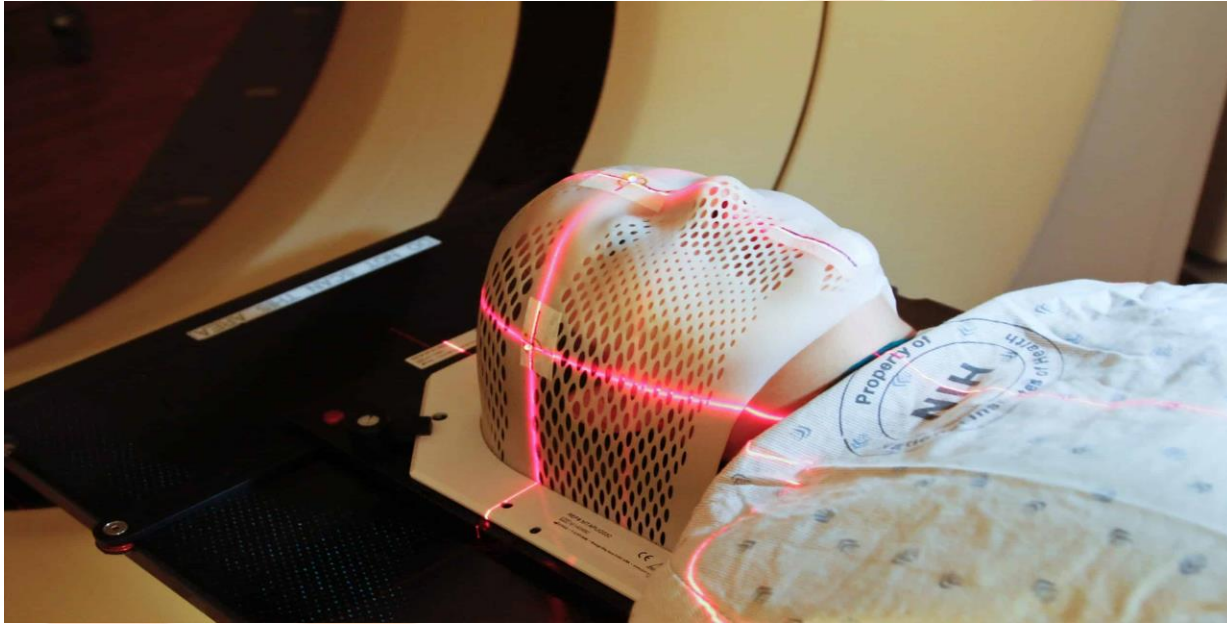
**WHY SPEECH AND/OR SWALLOWING  
DIFFICULTIES MIGHT DEVELOP BEFORE  
/ DURING / AFTER RADIOTHERAPY IN  
NPC?**

**WHAT CAN BE DONE?**

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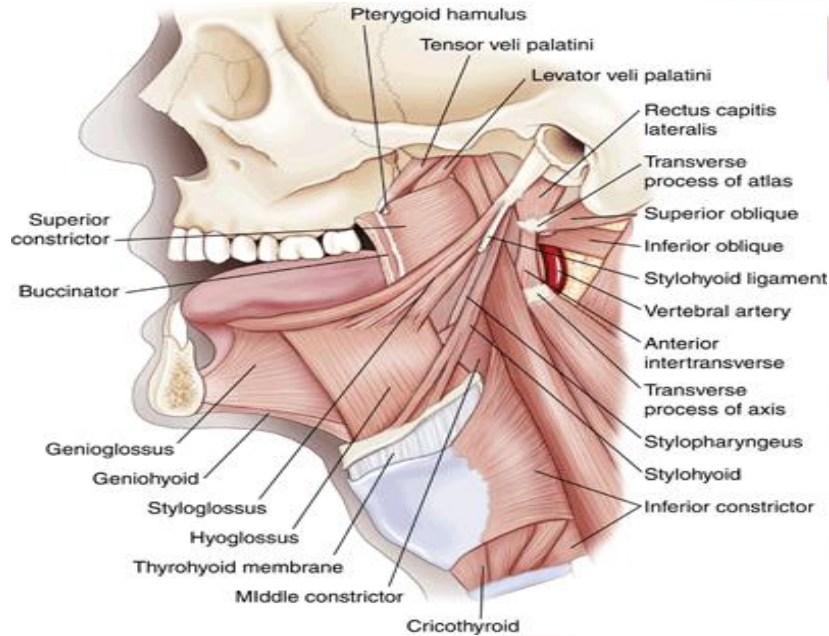
# Radiotherapy



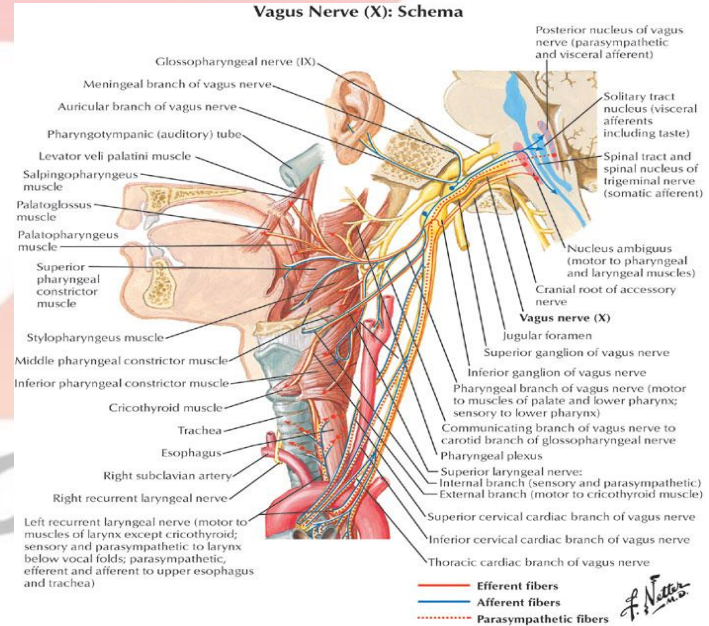
<https://thangguide.org/cancer-basics/treatments/radiation/>



# How does radiotherapy affect speech and swallowing?



**Muscles**

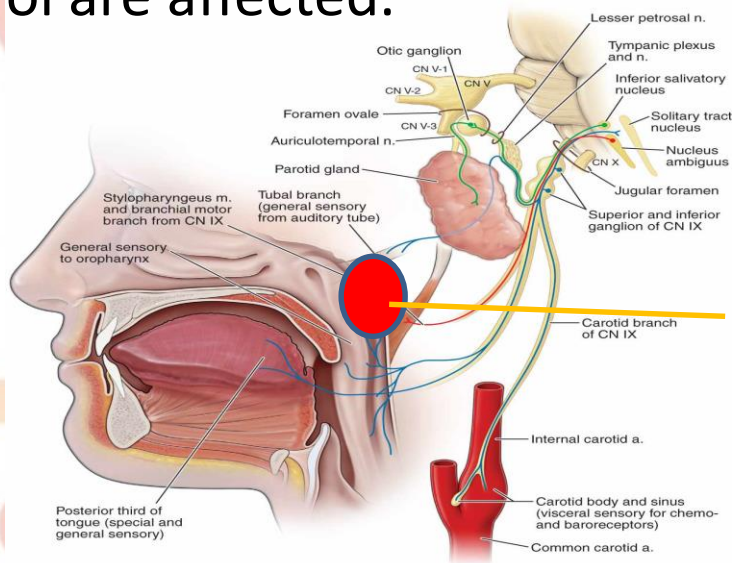


**Nerves**

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# Why speech and swallowing difficulties can develop before radiotherapy?

- Speech and swallowing difficulties may be present **at the time of the NPC diagnosis** if the cranial nerves involved in speech and swallowing control are affected.



NPC pressing on nerves

# Why speech and swallowing difficulties can happen

- may also occur **during and after treatment.**
  - effects of radiation on speech and swallowing function may vary.
  - radiotherapy can lead to **muscle fibrosis, muscle swelling, and damage of nerves.** Usually these problems are not picked up until several months or years after its onset.

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# Why speech and swallowing difficulties during radiotherapy?

- Radiotherapy might include chemotherapy.
  - Mucositis - inflammation and ulceration
  - Dry mouth
  - Rarely see muscle fibrosis and damage of nerves.

Mucositis



[https://www.aaom.com/index.php?option=com\\_content&view=article&id=149:oral-mucositis&catid=22:patient-condition-information&Itemid=120](https://www.aaom.com/index.php?option=com_content&view=article&id=149:oral-mucositis&catid=22:patient-condition-information&Itemid=120)

Dry Mouth



[https://www.google.com/search?q=xerostomia&tbm=isch&ved=2ahUKEwigkZvFjc3gAhVWFSSKHUIFCZ0Q2-cCegQIABAA&pg=xerostomia&gs\\_lcp=CgNpbWcQAzICCAAvAggAMgIIADICCAAvAggAMgIIADICCAAvAggAMgIIADICCAAvAggAELEDUPG5AliwxwJgr8gCaABwAHgAqAFClAHJA5IBAJEwmAEoAEbBgqELZ3dzLXdpei1pbWc&scient=img&ei=m9UNX-rXKdaqrAHCiqToCQ&bih=524&biw=1242&hl=en#imgrc=3luC81z\\_W3VY8M](https://www.google.com/search?q=xerostomia&tbm=isch&ved=2ahUKEwigkZvFjc3gAhVWFSSKHUIFCZ0Q2-cCegQIABAA&pg=xerostomia&gs_lcp=CgNpbWcQAzICCAAvAggAMgIIADICCAAvAggAMgIIADICCAAvAggAMgIIADICCAAvAggAELEDUPG5AliwxwJgr8gCaABwAHgAqAFClAHJA5IBAJEwmAEoAEbBgqELZ3dzLXdpei1pbWc&scient=img&ei=m9UNX-rXKdaqrAHCiqToCQ&bih=524&biw=1242&hl=en#imgrc=3luC81z_W3VY8M)



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# Complaints during the course of radiotherapy with/without Chemo

- **Dry mouth (Xerostomia)**

- Perform oral hygiene after each meal and before bedtime
- Keep water handy at all times to moisten the mouth
- Use artificial saliva (e.g. Oralseven™ and etc.) to moisten the mouth if necessary
- **Avoid** the use of **alcohol based** mouth wash




# Complaints during the course of radiotherapy with/without Chemo

- **Pain when chewing and swallowing due to inflammation and ulceration**
  - Eat foods that are easy to chew and swallow (e.g. porridge, minced meat or vegetable, soft fruits such as banana)
  - Cut foods into small pieces
  - Avoid foods that irritate the mouth
  - Eat foods cold or at room temperature



# Modified diet and thickened fluids

Fluid	<b>Mildly Thick Level 150</b> Fluid runs freely off the spoon but leaves a mild coating on the spoon.	<b>Moderately Thick Level 400</b> Fluid slowly drips in droplets off the end of the spoon.	<b>Extremely Thick Level 900</b> Fluid sits on the spoon and does not flow off it.
			
Food	<b>Texture A Soft</b> Food may be naturally soft or may be cooked or cut to alter its texture.	<b>Texture B Minced and Moist</b> Food is soft, moist and easily mashed with a fork; lumps are smooth and rounded.	<b>Texture C Smooth Pureed</b> Food is smooth, moist and lump free; may have a grainy quality.
			

<http://www.myhealth.gov.my/en/oral-care-for-person-with-swallowing-difficulty/>



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# Complaints during the course of radiotherapy with/without Chemo

- **Pain when chewing and swallowing due to inflammation and ulceration**
  - If the **pain is unbearable** and it is affecting oral intake, **tube feeding** is recommended to ensure adequate nutritional intake.
  - Numb the mouth with ice chips, ice-cream, or flavoured ice pops
  - Supplement meals with high-calorie, high-protein drinks (Consult a dietician if supplement is required)



# Complaints that may present due to late effects of radiotherapy:

- Dry mouth
  - Perform oral hygiene after each meal and before bedtime
  - Keep water handy at all times to moisten the mouth
  - Use artificial saliva (e.g. Oralseven™ and etc.) to moisten the mouth if necessary
  - Avoid the use of alcohol based mouth wash

# Complaints that may present due to late effects of radiotherapy:

- Altered taste sensation
  - Eat small, frequent meals and healthy snacks
  - Use plastic utensils if foods taste metallic
  - Use sugar-free lemon drops or mints when experiencing a metallic or bitter taste in the mouth
  - Try favourite foods

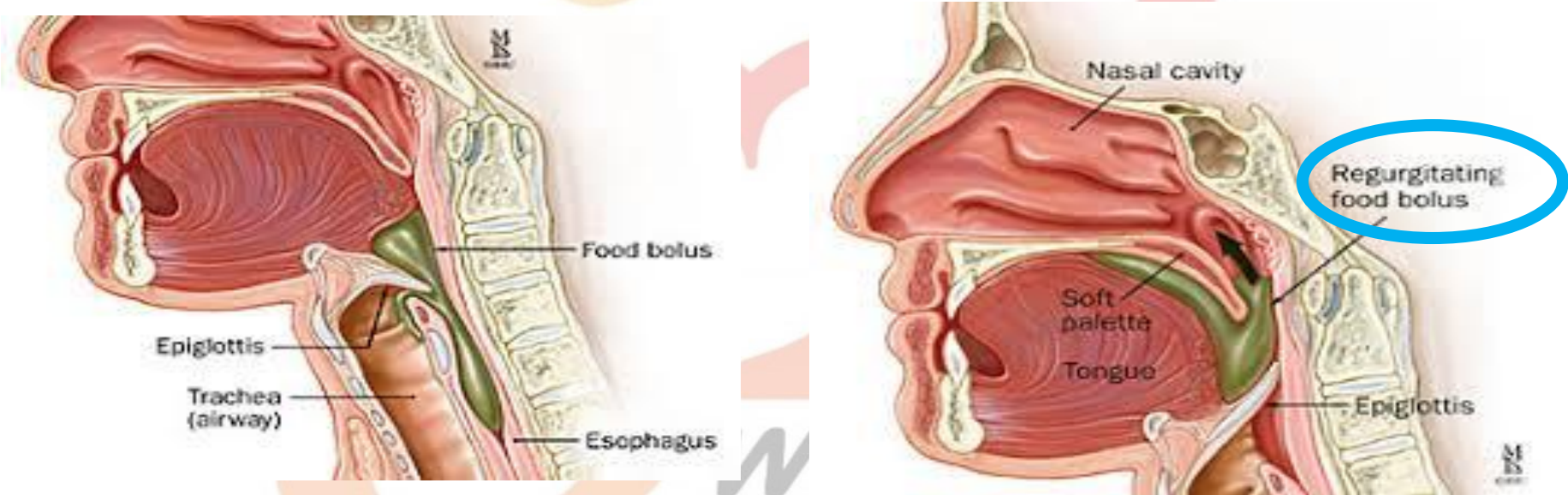
# Complaints that may present due to late effects of radiotherapy:

- Bad breath (Halitosis)
  - Keep your mouth as moist as possible all the time.
  - Perform nasal wash after each meal especially for those who are experiencing food or liquid coming out from nose





# Nasal regurgitation



[https://www.hopkinsmedicine.org/gastroenterology\\_hepatology/pdfs/esophagus\\_stomach/swallowing\\_disorders.pdf](https://www.hopkinsmedicine.org/gastroenterology_hepatology/pdfs/esophagus_stomach/swallowing_disorders.pdf)



# Complaints that may present due to late effects of radiotherapy:

*\* If notice any of the following, please consult an ENT doctor or a speech therapist*

- Voice change (i.e. Hoarseness, hypernasality - voice sounds like coming out from the nose, soft and breathy)
- Poor speech intelligibility
- Tongue tremors (Fasciculation)
- Restricted mouth opening (Trismus)
- Food or liquid coming out from nose
- Food sticking in throat

# Complaints that may present due to late effects of radiotherapy:

- Requiring drinks to wash food down
- Coughing and choking while eating/drinking
- Taking longer time to finish a meal
- Avoiding certain food
- Difficulties in breathing after eating/drinking together with flu-like symptoms such as fever, chills, drowsiness, increased in phlegm. *\* These are signs of chest infection. If these presentations are noted, immediate medical attention is necessary.*

# Hearing Loss in Patients with NPC

By Mr Liew

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How do Speech Therapists manage  
speech and swallowing difficulties in  
patients with NPC?

*WORKS*

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# How do Speech Therapists manage speech and swallowing difficulties in patients with NPC?

- Assessment
  - Clinical Bedside Evaluation
  - Objective assessment
    - Videofluoroscopy (VFS)
    - Fiberoptic Endoscopic Examination for Swallowing (FEES)



X-ray tube

Fluoroscope



# VFS (Video)



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# FEES (Video)



# ST management:

## **Before starting chemo/radiotherapy:**

- Assess speech and swallowing functions and recommend diet or alternative feeding method (i.e. nasogastric tube feeding) or swallowing strategies as appropriate.
- Counselling on the possible immediate and long term side effects of chemo/radiotherapy and ways to manage should those side effects occur.

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# ST management:

## During and after chemo/radiotherapy:

- Assess speech and swallowing functions and recommend diet or alternative feeding method or swallowing strategies as appropriate.
- Teach exercises to **preserve swallowing function**
- Teach exercises to improve muscle strength or movements
- Refer patients to the other professionals for further management if necessary.

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# Speech impairment (Mild)

- Oromotor exercises
- Compensatory strategies (Strategies to speak clearer)

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# Speech impairment (Moderate / Severe)

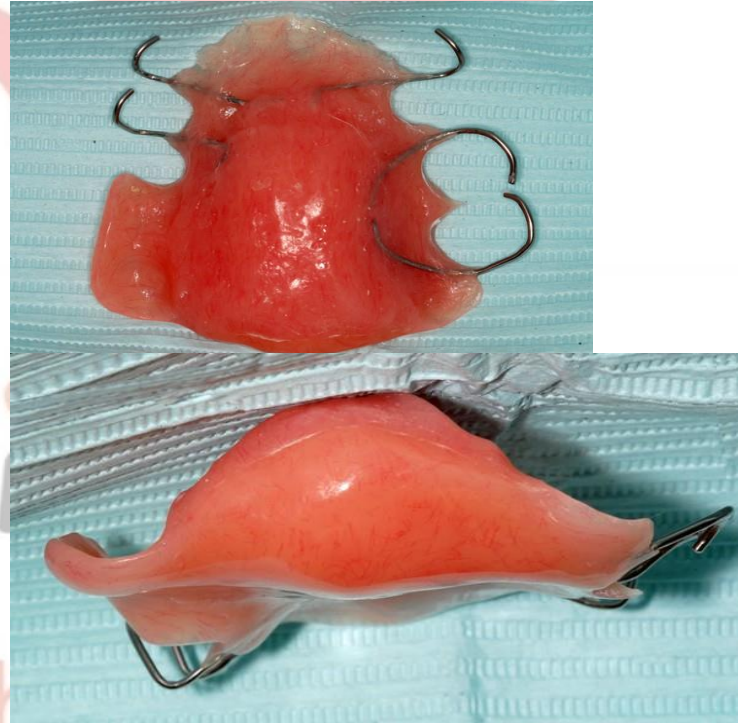
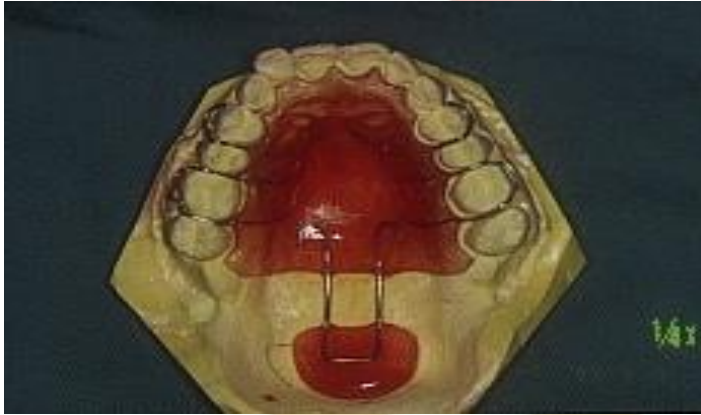
- Oromotor exercises
- Compensatory strategies
- \*Prosthetic management
  - Voice amplifier
  - palatal lift / palatal augmentative prosthesis
  - Augmentative and alternative communication
- \*Surgical management
  - E.g. Vocal cord medialisation





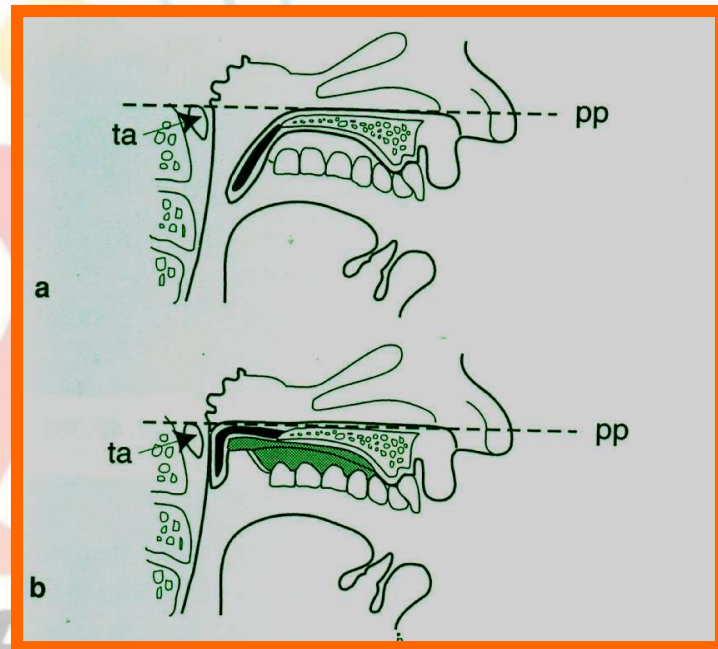
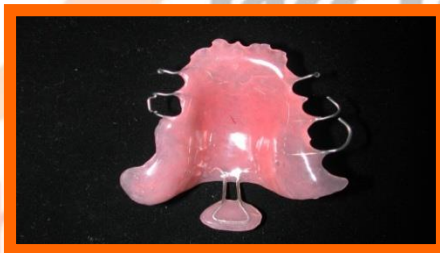
# Prosthetic Devices

- Palatal augmentation prosthesis (a.k.a palatal drop)
- Palatal lift



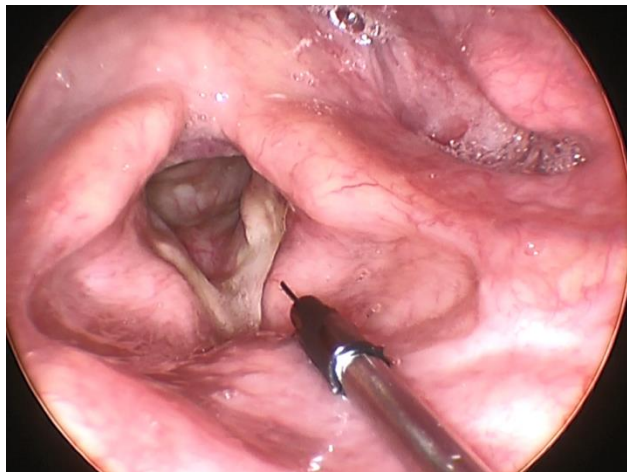


## Palatal Augmentation Prosthesis

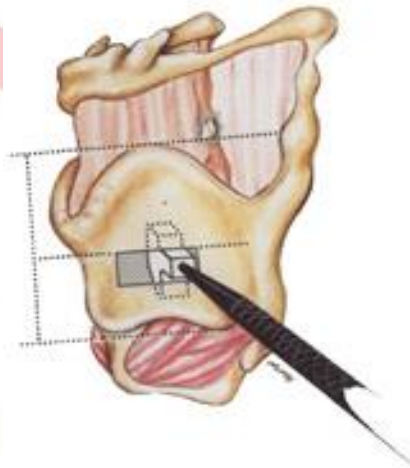


## Palatal Lift Prosthesis

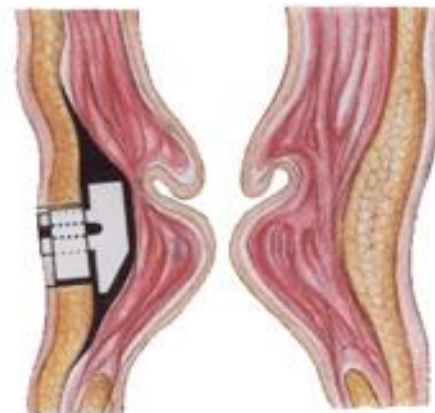
# Surgery: Medialization thyroplasty



Injection



Implant (silicone)

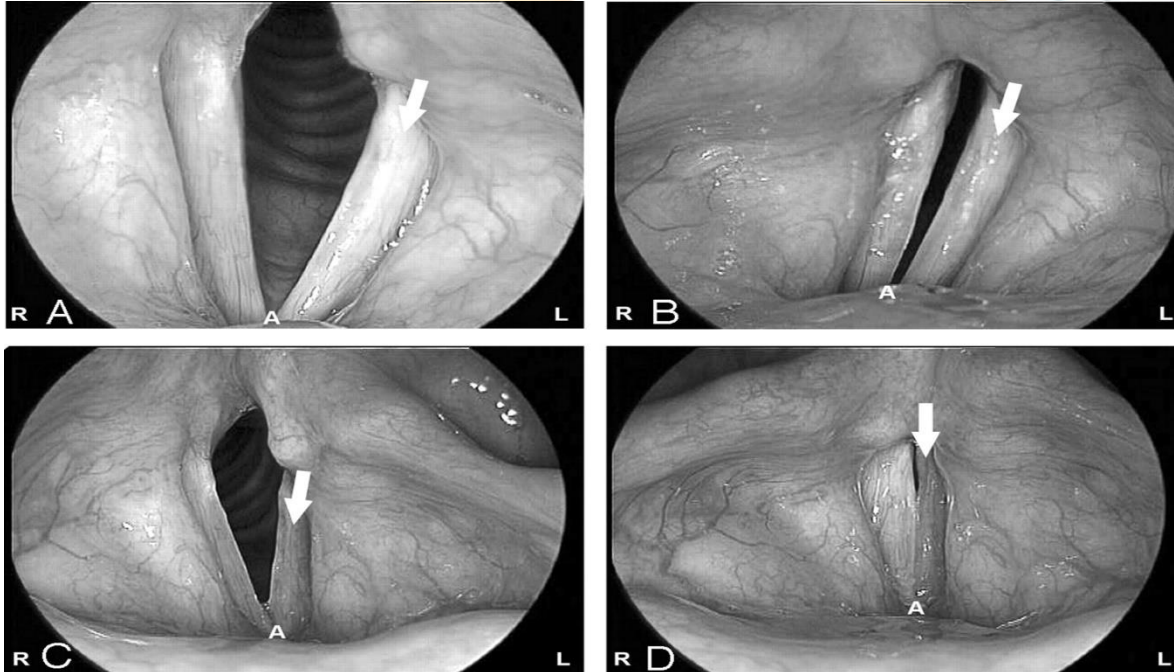


<https://medicine.uiowa.edu/iowaprotocols/vocal-cord-injection-prolarynx-gel-videostroboscopy-transoral>  
(Video)

<https://www.ohsu.edu/ent/voice-swallowing-problems/disorders>



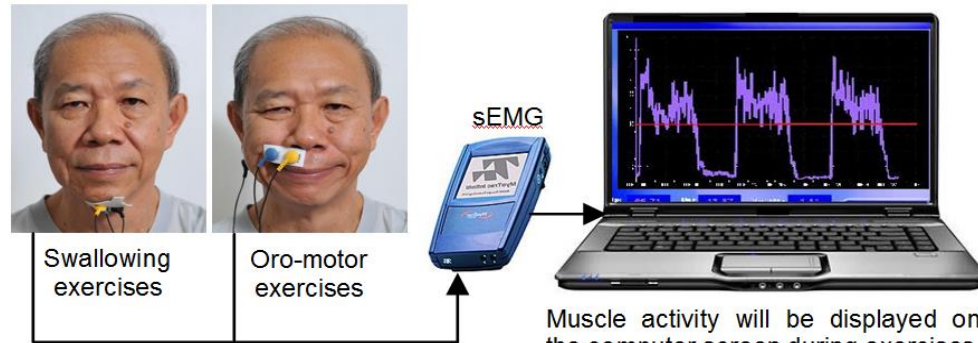
# Surgery: Vocal Fold Medialisation



<http://www.ajnr.org/content/27/8/1643>

# Swallowing impairment (Mild)

- Swallowing strategy
- Swallowing exercise
- May require some diet or fluid modifications



Swallowing therapy with sEMG biofeedback

Muscle activity will be displayed on the computer screen during exercises. Goals can be customized for each client.

# Swallowing impairment (Moderate)

- Modified diet
- Swallowing strategy
- Swallowing exercises
- Prosthetic management
- Surgical management





# Swallowing impairment (Severe)

- Swallowing exercises (Maintenance)
- Compensatory strategy
- Prosthetic management
- Surgical management
- Tube feeding - NGT, PEG

# CAN SPEECH AND SWALLOWING FUNCTION BE PRESERVED AFTER RADIOTHERAPY?

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# Swallowing preservation exercises (SPE)

- A set of exercises with the aim to maintain the movements of the range of motion of the oral, throat and voice box.
- Consult a speech therapist / pathologist to learn this.
- SPE should be performed before, during and after completed the radiotherapy.
- Learning SPE through telepractice session is possible.

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# Summary

- Speech and swallowing difficulties might occur before, during and after radiotherapy
- Consult a speech therapist even before starting the radiotherapy.
- Learn and start to perform swallowing preservation exercises even before, during and after completed radiotherapy.



**Thank you**

***WORKS***

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# To download the handouts:

-Visit:

<https://dysphagia.sg/2020/07/17/live-on-fb-speech-swallowing-and-hearing-difficulties-in-nasopharyngeal-cancer-npc-before-during-and-after-radiotherapy-why-and-how-to-manage-ok/>

or

- Scan this QR code:



SCAN ME



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