

Swallowing disorders in the elderly

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To Swallow:

Cause or allow something to pass
down the throat



Definitions

Swallowing

Appetite:

Wish to eat, hungry
sensation


Eating pleasure

Feeding:

Providing to the individual the food necessary for their
subsistence

Nutrition:

Process of taking in and using food, or the scientific
study of this



Normal Swallowing adults

Physiology of swallowing

Physiology of swallowing

- ▶ **Swallowing function**

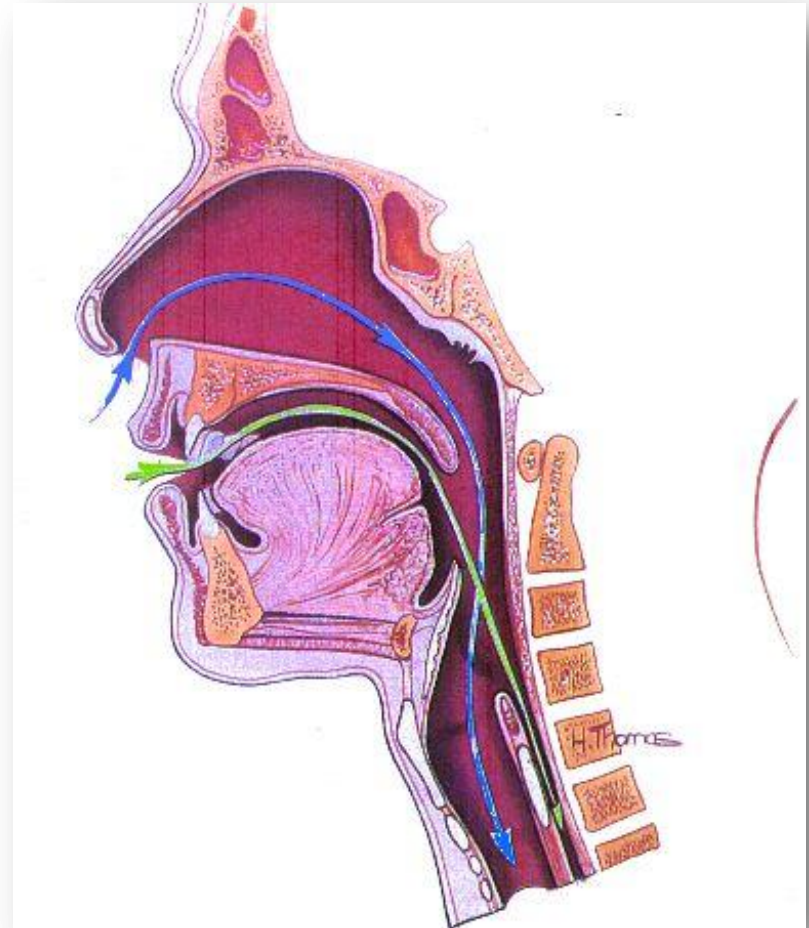
- ▶ Coordination of muscles and joints for the progression of the bolus from the mouth to the stomach
- ▶ Coordination: sensorial, motor and chronological of the different anatomical structures of oral cavity, pharynx and oesophagus

Physiology of swallowing in adults



Physiology of swallowing in adults

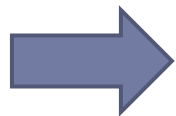
- ▶ **Combination**
 - ▶ Propulsion forces
 - ▶ pass the bolus to the stomach
 - ▶ Opening and closing of « sphincters »
 - ▶ « drive » bolus in the good way and good timing into the aero-digestive crossroads
- ▶ **Neurological control**
 - ▶ Cortical, central grey nuclei, cerebellum
 - ▶ Cranial nerves
 - ▶ 40 pairs of muscles



Physiology of swallowing in adults

- 4 phases of swallowing:
 - 1. Preparatory Phase
 - 2. oral Phase
 - 3. Pharyngeal Phase
 - 4. œsophageal Phase
- } **Voluntary**
- } **Reflex**
- } **Vegetative**

Synergy and interaction between the different phases



The dysfunction of one phase can have consequences on the others

Swallowing in the elderly

Healthy and pathological

Definitions

- ▶ **Dysphagia:** Any disruption in the swallowing process
- ▶ **Oropharyngeal dysphagia:** difficulty to effectively move the alimentary bolus from the mouth to the oesophagus
- ▶ **Swallowing disorders/dysphagia**
 - ▶ **Stasis:** slowing or stoppage of the normal flow of a bodily fluid or semi-fluid
 - ▶ **Aspiration:** entry of material in the airway **BELOW** the vocal folds
 - ▶ **Laryngeal penetrations:** entry of material in the larynx until the level of the vocal folds



Definitions

- ▶ **Presbyphagia:**
 - ▶ **Primary prebyphagia:**
 - ▶ Effect of natural healthy aging on the head and neck anatomy, on physiology and neural mechanisms of swallowing function (Ney et al. 2000)
 - ▶ **Secondary presbyphagia:**
 - ▶ Increase of the prevalence of chronic pathologies, side effects of medications causing swallowing disorders
- ▶ **Presbyphagia ≠ Dysphagia**
 - ▶ Compromised compensatory ability
 - ▶ Naturally diminished functional reserve

→ **Susceptibility to dysphagia in the elderly**



Continuum presbyphagia → dysphagia

▶ Progressive degradation of the swallowing fonction

→ spontaneous adaptations made

- ▶ Eat smaller amount
- ▶ Adapt the quality
- ▶ Longer meals
- ▶ Avoid to eat or drink

→ Persons may not complaint about swallowing spontaneously

→ Importance of determining early dysphagia stage to prevent evolution toward dysphagia complications



Prevalence of presbyphagia

- ▶ Questionnaires in >60 year-old healthy people (Brasil)
 - ▶ 21% declare previous choking,
 - ▶ 10% coughing,
 - ▶ 7% throat clearing in Brasil
- ▶ Fiberoptic Endoscopic Evaluation of Swallowing (FEES):
 - ▶ 39% pharyngeal residue
 - ▶ 6% saliva stasis
 - ▶ 9% penetration
 - ▶ 2% aspiration
 - ▶ 8% loss of laryngeal sensitivity
- ▶ No reliable link between complaints and FEES findings

Prevalence of dysphagia in the elderly

- ▶ **>65 y-o:**
 - ▶ 13% of the total population
 - ▶ 51% of the institutionnalized population
 - ▶ 47% of frail elderly hospitalized for acute illness
 - ▶ Prevalence of dysphagia increased with presence of neurological disease, age and frailty.
 - ▶ Dysphagia is a factor of worse prognosis

- ▶ **Among independently living people**
 - ▶ 70-79 y-o: 16%
 - ▶ >80 y-o: 33%

Pathophysiology of presbyphagia

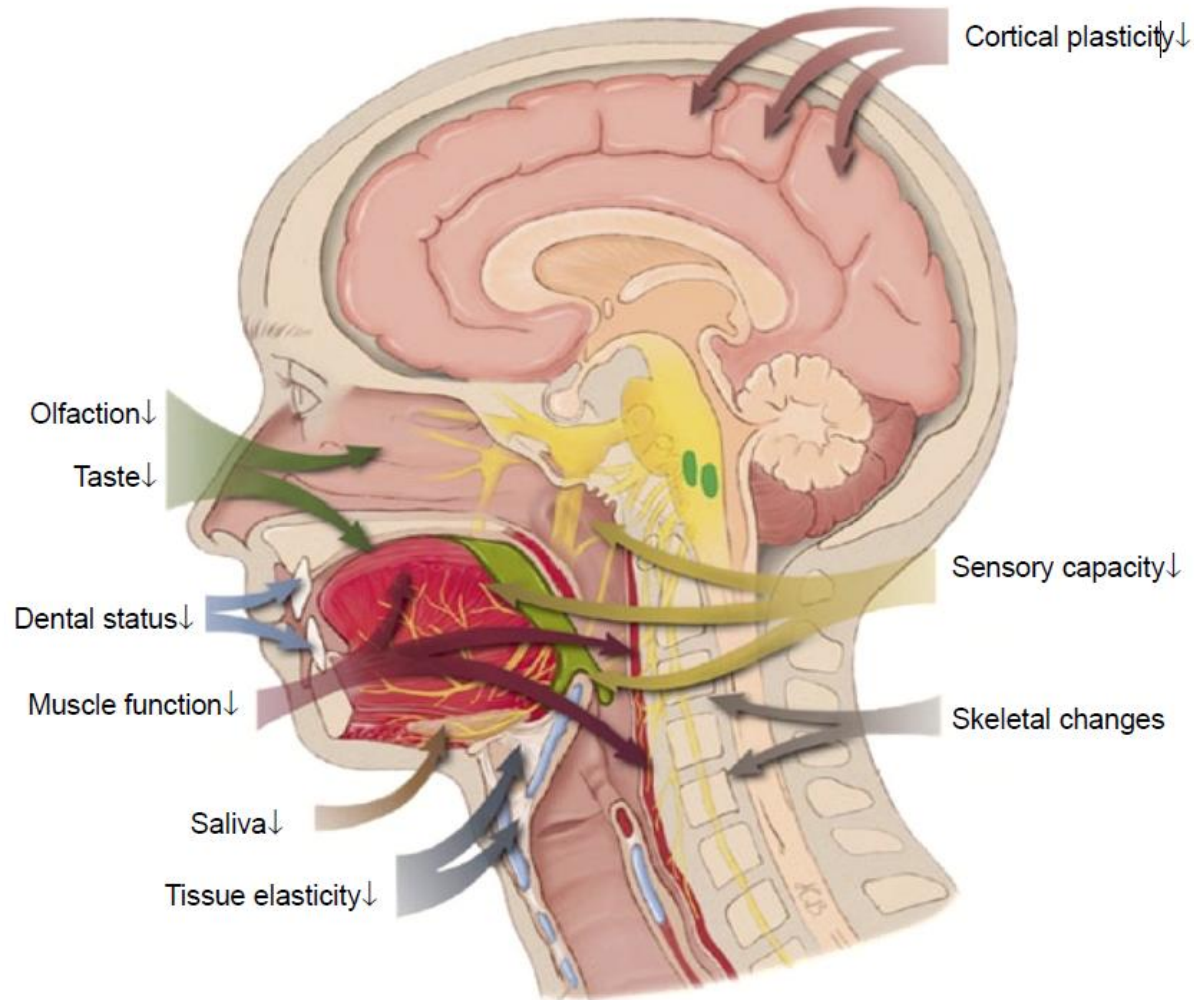
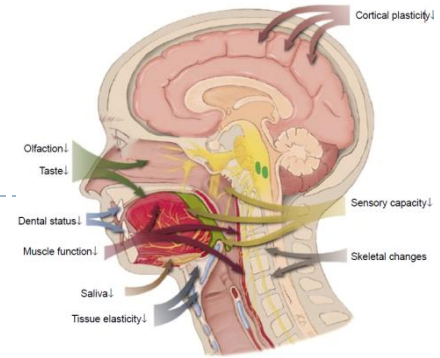


Figure 1 Factors associated with dysphagia in older persons.

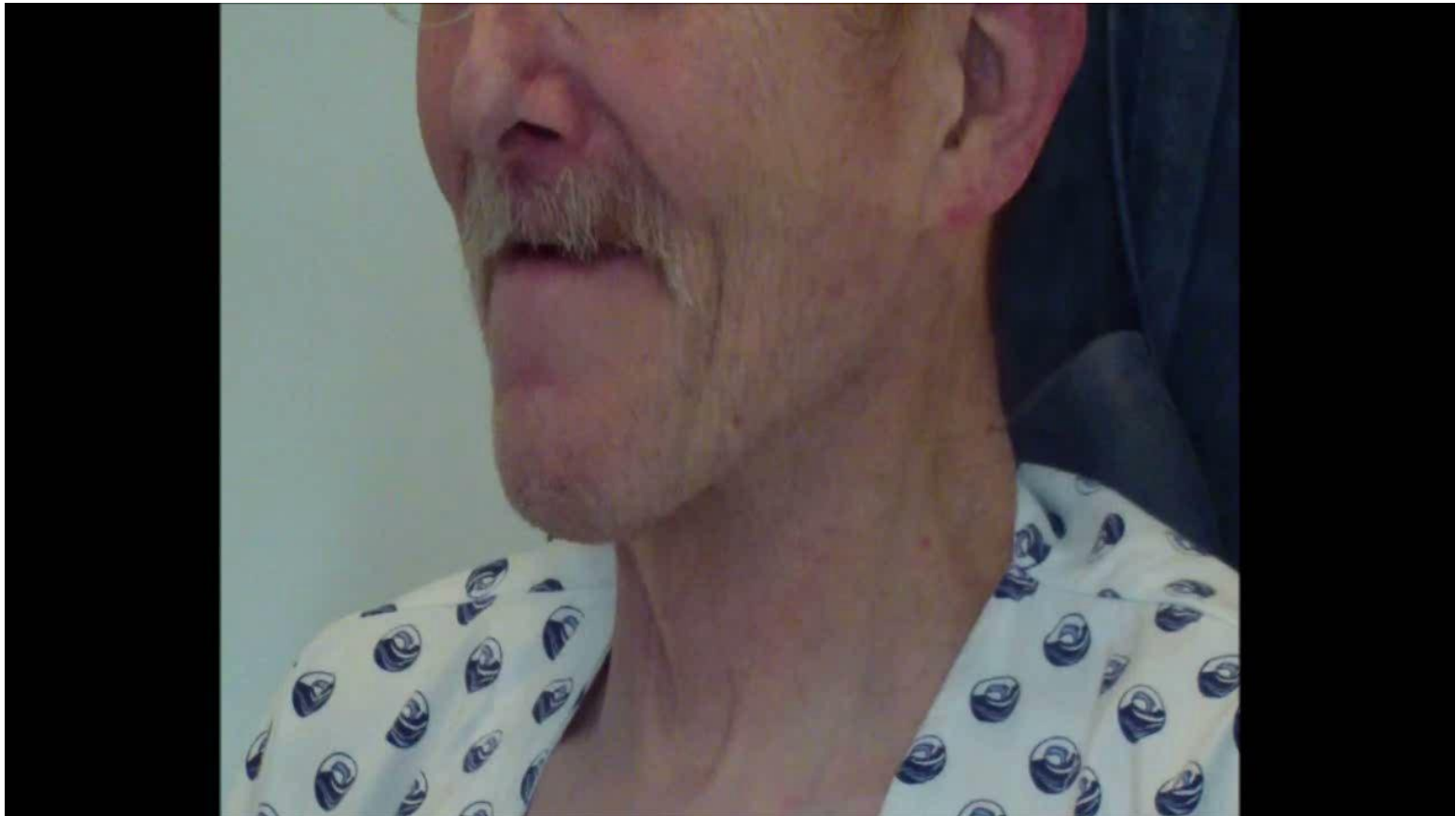
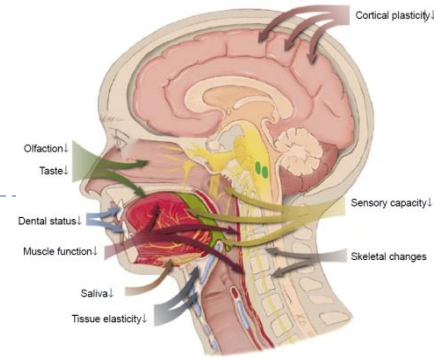
Note: ↓ Indicates decreased function. Modified from Muhle P, Wirth R, Glahn J, Dziewas R. [Age-related changes in swallowing. Physiology and pathophysiology]. *Nervenarzt*. 2015;86(4):440–451.²⁹

Oral Phase modifications

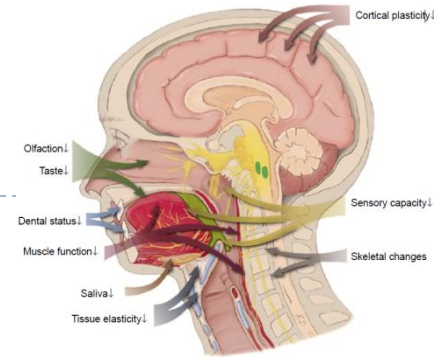
- ▶ Impaired dental status
- ▶ Decreased force of the tongue
 - ▶ Decrease in the maximal isométric contraction
 - ▶ Stability of the force amplitude during swallowing (sub-maximal effort), but slower contraction
- ▶ Xerostomia
 - ▶ Associated pharyngeal and oesophageal dryness
 - ▶ Decreased saliva-producing acinar cells
 - ▶ Not significant modification with age, but higher drying effect of medications
- ▶ Modification of sensory inputs
 - ▶ Taste and olfaction,
 - ▶ Temperature
 - ▶ Tactile sensation



Oral Phase modifications



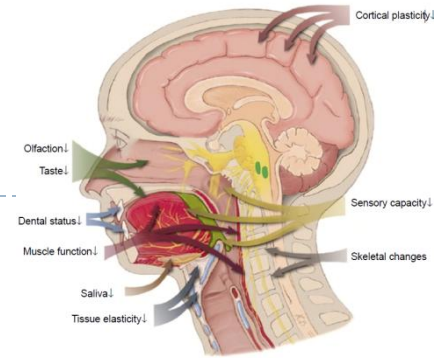
Oral Phase modifications



- ▶ Impaired dental status + Decreased force of the tongue + Xerostomia
 - ▶ Prolonged oral phase
 - ▶ Prolonged meals
 - ▶ Modification of sensory inputs of taste and olfaction,
 - ▶ Decreased eating pleasure
 - ▶ Decreased intake quantities
-



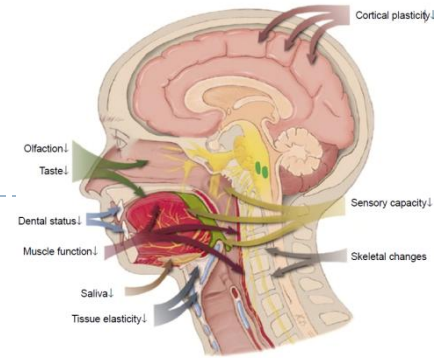
Pharyngeal Phase modifications



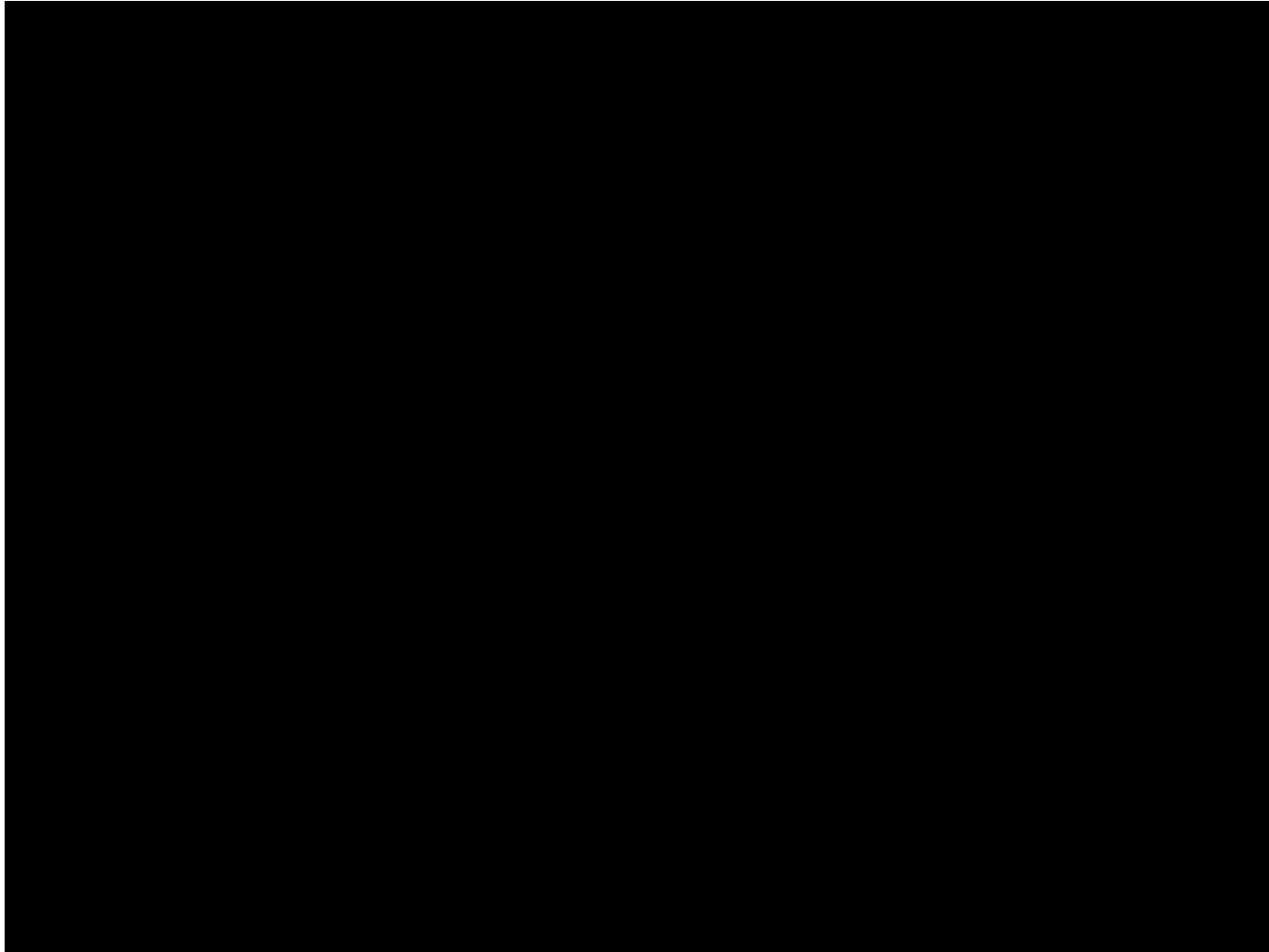
- ▶ Changes in the cervical spine
- ▶ Weak sensitivity of the trigger zones of swallowing reflex
- ▶ Reduced mass and function of the swallowing muscles
 - ▶ Reduced pharyngeal constriction
 - ▶ Reduced base of tongue retraction
 - ▶ Reduced laryngeal excursions
 - ▶ Association of whole body muscle mass and function with swallowing muscle mass and function probable.

Pharyngeal Phase modifications

- ▶ Changes in the cervical spine
- ▶ Weak sensitivity of the trigger zones of swallowing reflex
 - ▶ Initiation of pharyngeal and laryngeal events delayed
 - ▶ Including the laryngeal closure
 - ▶ More time in the vicinity of the open airway, by pooling or pocketing in the pharyngeal recesses
 - ▶ Penetration of the bolus into the larynx occurs more often and to a deeper and more severe level than in younger adults
- ▶ Reduced mass and function of the swallowing muscles
 - ▶ Reduced pharyngeal clearance (pharyngeal stasis)
 - ▶ More time in the vicinity of the open airway, after swallow



Pharyngeal Phase modifications



Oesophageal Phase modifications

- ▶ Upper esophageal sphincter (UES)
 - ▶ Part of the oesophagus the most susceptible:
 - ▶ Reduction of the cross-sectional area of sphincter opening
 - ▶ Mainly the antero-posterior diameter

 - ▶ 4 mechanisms of UES opening:
 - ▶ UES relaxation: cessation of the cholinergic excitatory signals to the cricopharyngeus muscle
 - ▶ Distensibility of the UES
 - ▶ **Distraction of the hyo-laryngo-cricoid complex anteriorly and superiorly by contraction of supra-hyoid muscles**
 - ▶ Pressure imparted from within the of UES

- ▶ Body and inferior oesophageal sphincter (IES)
 - ▶ Loss muscle peristaltism
 - ▶ Loss of tissue elasticity



Consequences of dysphagia

- ▶ **Aspiration pneumonia**

- ▶ Result of inhaling bacterially contaminated saliva or foreign substance
- ▶ 5-15% of community-acquired pneumonias
- ▶ Most common complication of aspiration
- ▶ 30-day death rate: 21% overall, 30% in health care-associated aspiration pneumonia

- ▶ **Chronic inflammation of the lungs, lung abscesses**


- ▶ **Sepsis**




Consequences of dysphagia

- ▶ Dehydration and Malnutrition
 - ▶ Dysphagia
 - ▶ Reduction of oral intake
 - ▶ Fear to eat
 - ▶ Co-responsible factors of malnutrition and dehydration
 - ▶ Anorexia of aging
 - ▶ Cognitive decline
 - ▶ Social, emotional, health problems
 - ▶ Neurological disease and decreased ability to eat independently
 - ▶ Effects of malnutrition and dehydration on dysphagia
 - ▶ Malnutrition → Sarcopenia
 - ▶ Dehydration → Xerostomia and oral bacterial colonization
 - ▶ Reduced quality of life
-





Screening, Diagnosis, and
Management of swallowing disorders
in elderly



Early Management: prevention +++

- ▶ Dental care
- ▶ Limitation of medication with impact on swallowing function
 - ▶ Medication with anti-cholinergic action
 - ▶ Xerostomia
 - ▶ Sedatives
 - ▶ Reduction of the vigilance
 - ▶ Opioids
 - ▶ Suppression of the coughing reflex
 - ▶ Neuroleptics
 - ▶ Secondary parkinsonism



Early Management: prevention +++

- ▶ Screening of presbyphagia/early stage of dysphagia
 - swallowing therapy or preventive maneuvers
 - ▶ In active, independent elderly population
 - ▶ In frail elderly before dysphagia or malnutrition complications
 - ▶ Screening tool: FEES



Screening of dysphagia

- ▶ **Screening**

- ▶ Identification of patients with greatest risk of dysphagia
- ▶ Nurse, speech therapist



Screening

- ▶ If failure of any item:
 - ▶ Discontinue the test
 - ▶ Call the SLP

TOR-BSST The Toronto Bedside Swallowing Screening Test

(addressograph)

DATE: _____ TIME: _____
Number: _____

Patient _____

A) Before water intake: (Mark either normal, abnormal or unable to assess for each task.)

1. Have patient say 'ah' and judge voice quality.	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to assess _____
2. Ask patient to stick their tongue out and then move it from side to side.	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to assess _____
3. Stroke posterior wall of throat on each side and ask patient if they can feel it.	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to assess _____

B) Water Intake: While the patient is sitting upright give 10 x 5ml (teaspoon) boluses followed by a sip from a cup. Ask patient to say "ah" after each swallow. If any coughing or change in voice quality occurs, stop the test and check appropriate box. Do not mark normal findings in this section. If you are unable to continue the water swallows to your satisfaction of patient safety, record the reason for terminating in the Unable to Assess box.

1 TSP. SWALLOWS	Cough during/ after swallow	Wet voice after swallow	Unable to Assess (Give reason)
Swallow 1	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 2	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 3	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 4	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 5	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 6	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 7	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 8	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 9	<input type="checkbox"/>	<input type="checkbox"/>	_____
Swallow 10	<input type="checkbox"/>	<input type="checkbox"/>	_____
2) Free drinking from a cup	<input type="checkbox"/>	<input type="checkbox"/>	_____
3) Drool during water swallows?	<input type="checkbox"/>		_____

C) After water intake:

1. Have patient say 'ah' again and judge voice quality	Normal <input type="checkbox"/>	Abnormal <input type="checkbox"/>	Unable to Assess _____
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D) Results: Passed (no abnormal results) Failed (1 or more abnormal results)

If Failed initiate referral to SLP

Nurse's Signature: _____



Clinical assessment

- ▶ Speech Language Pathologist
- ▶ Comprehensive clinical assessment of swallowing
 - ▶ Comprehensive medical history
 - ▶ Physical exam of oral and motor function
 - ▶ Assessment of food intake
- ▶ Repeated for evolution
- ▶ Orientation of the specific management
 - ▶ Instrumental assessment
 - ▶ treatment



Instrumental assessment: FEES and VFS

- ▶ Fiberoptic Endoscopic Evaluation of Swallowing
- ▶ Videofluoroscopy of swallowing
 - ▶ Complementary
 - ▶ Diagnosis of swallowing disorders
 - ▶ Test behavioral strategies or bolus alteration:
« therapeutic » evaluations



Instrumental assessment: FEES

- ▶ **Fiberoptic Endoscopic Evaluation of Swallowing**
 - ▶ Before swallowing
 - ▶ Preliminary assessment of the anatomy
 - ▶ Secretions/saliva stasis
 - ▶ Movement of key-structures in non-swallowing tasks
 - ▶ Sensitivity
 - ▶ During salivary swallowing task
 - ▶ White-out during swallowing
 - ▶ During swallowing
 - ▶ Pasty, liquid and solid bolus,
 - ▶ Various sizes



Instrumental assessment: FEES

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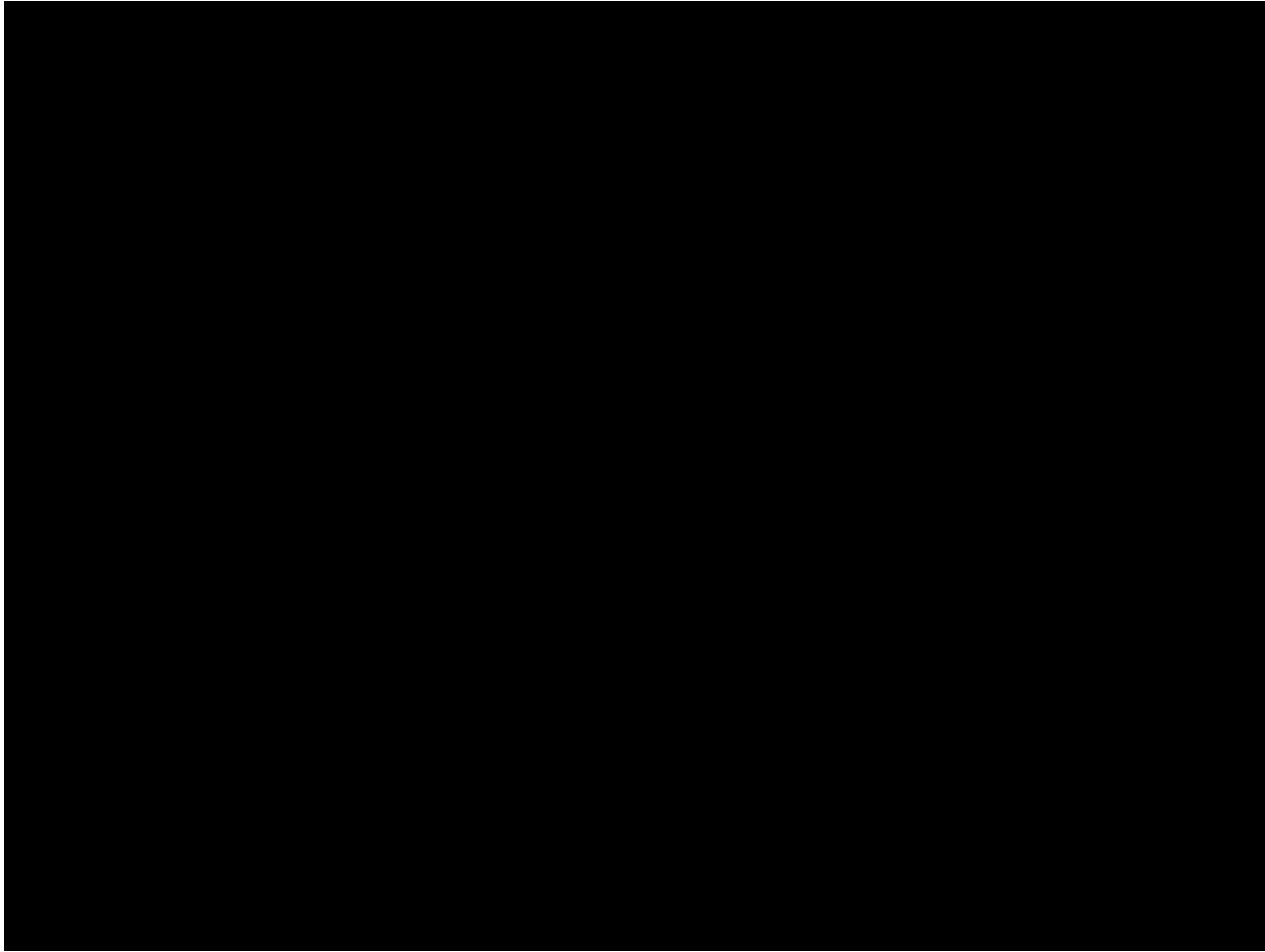


Instrumental assessment: FEES

- ▶ **Consistencies tested**
 - ▶ Thickened blue water/gel
 - ▶ Blue with methylene blue (10mg/1mL per 1L water)
 - ▶ 2 spoons of thickening powder/50mL
 - ▶ 5x Teaspoon
 - ▶ Liquid (blue water)
 - ▶ Teaspoon
 - ▶ Little sips with an indented glass
 - ▶ Soft cake
 - ▶ Little piece



Instrumental assessment: FEES

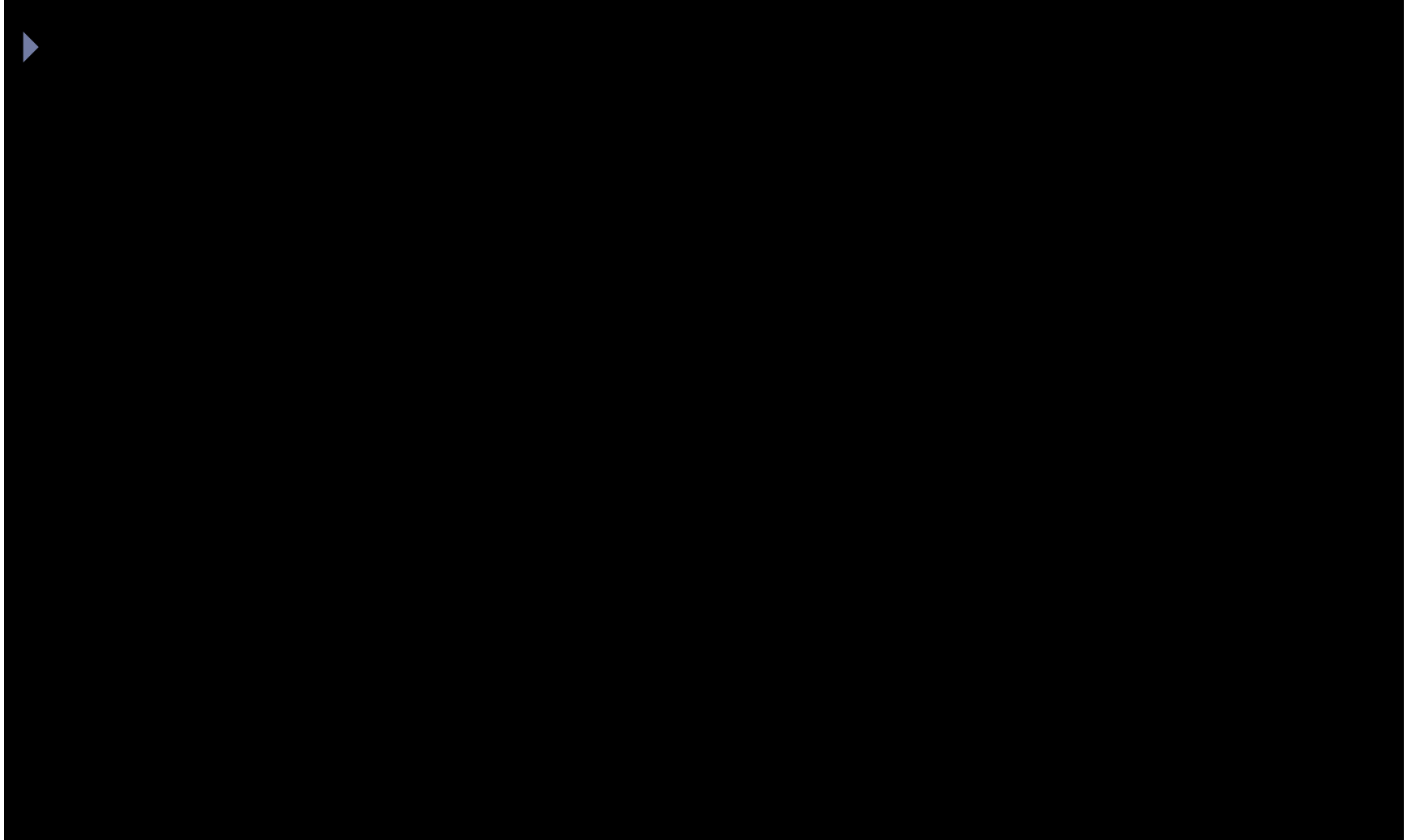


Instrumental assessment: VFS

- ▶ Videofluoroscopy of swallowing
 - ▶ Complementary to the FEES
 - ▶ Traditional gold standard for diagnosis of dysphagia
- ▶ Swallowing boluses prepared with baryum (liquid, fluid, solid)
- ▶ Exploration of the 3 phases including oesophageal phase
- ▶ Accurate evaluation of the UES



Clinical Case



Management: treatments

- ▶ **Patients with mild symptoms**
 - ▶ Reduction of volume and increase in bolus viscosity
- ▶ **Patients with severe symptoms**
 - ▶ Also need changes in head posture,
 - ▶ Increased sensory input
 - ▶ Swallowing maneuvers
 - ▶ Other active treatments
- ▶ **Patients with severe aspiration or inefficient swallowing**
 - ▶ Tube feeding in addition to swallowing therapy
 - ▶ Minimal safe oral intake to maintain clearance of the throat
 - ▶ Oral hygiene mandatory



Management: Treatments

- ▶ **Three general principles:**
 - ▶ Main diagnosis
 - ▶ Patient's resources and needs
 - ▶ Setting the patient is living and treated in

- ▶ **Therapeutic swallowing intervention strategies**
 - ▶ Adaptative strategies
 - ▶ Dietary modifications
 - ▶ Compensatory strategies
 - ▶ Postural changes, specific swallowing strategies
 - ▶ Rehabilitative maneuvers
 - ▶ Head-lifting exercises, mendelsohn maneuver



Management: Nutritional intervention

▶ Objectives

- ▶ Reduction of aspiration
- ▶ Provision of the adequate amounts of energy and nutrients

▶ All kind of nutritional support

- ▶ Standard oral nutrition
- ▶ Texture modified diets
- ▶ Thichened liquids
- ▶ Complete enteral or parenteral nutrition
- ▶ Kind and duration of interventions depend on
 - ▶ Type and extent of swallowing disturbance
 - ▶ Nutritional status
 - ▶ Comorbidity

▶ Interdisciplinary intervention mandatory



Management: Artificial feeding

- ▶ Invasive procedure
- ▶ Indications
 - ▶ Gap between oral intake and nutritional demand
 - ▶ Function of the patient's general prognosis
- ▶ Guidelines for tube feeding in geriatrics if:
 - ▶ No oral intake possible for >3 days
 - ▶ Oral intake <50% of demands for >10 days
 - ▶ Based on individual comprehensive patient assessment.



Management: Artificial feeding

- ▶ Enteral nutrition preferred to parenteral
 - ▶ Lower rate of septic complications, cost-effectiveness
- ▶ Naso-gastric tube (NGT) vs percutaneous endoscopic gastrostomy (PEG)
 - ▶ No difference in mortality, complications, risk of pneumonia
 - ▶ Fewer intervention failure with PEG
 - ▶ Better return to oral intake with NGT
- ▶ Indications of PEG:
 - ▶ if enteral feeding likely to be needed for >28 days
 - ▶ If NGT rejected or not tolerated and artificial nutrition for >14 days
- ▶ NGT does not significantly interfere with swallow training
- ▶ Maintain as often as possible some additional oral intake according to the abilities of the patient



Dysphagia and dementia

- ▶ Most patient with dementing illness develop dysphagia
 - ▶ Dysphagia= prognosis factor of dementia
- ▶ Inability to follow the instructions
- ▶ Difficulty to transfer knowledge in daily life
- ▶ Upright position, oral hygiene, intact vigilance checked before eating or drinking
- ▶ Thickened liquids and/or chin-down posture
- ▶ PEG is not recommended in severe dementia:
 - ▶ does not prevent pneumonia,
 - ▶ does not improve the prognosis



Dysphagia in Parkinson disease

- ▶ 80% of all patients with PD experience dysphagia at some stage of the disease
- ▶ 130 months between 1st symptom and severe dysphagia
- ▶ No general recommendation for dysphagia management
 - ▶ Selection of techniques depend on individual pattern of dysphagia in each patient
 - ▶ LSVT, thermal-tactile stimulations, compensatory maneuvers
 - ▶ Thickened liquids (>chin tuck maneuver)
 - ▶ Expiratory muscles strength exercises
 - ▶ Video-assisted swallowing therapy
 - ▶ Individual assessment of levodopa responsiveness on swallowing function



Conclusion

- ▶ The earliest management is the most effective treatment of dysphagia

- ▶ Always think about potential swallowing disorder
 - ▶ Dysphagia is often unrecognized with serious health consequences
 - ▶ Especially in frail elderly
 - ▶ During acute illness



▶ Références

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