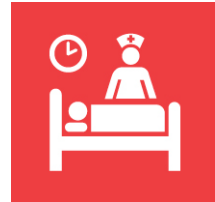


MODULE 5: SWALLOWING, NUTRITION AND ORAL CARE



Learning Objectives



Upon completion of this module, nurses will be able to:

- Define dysphagia
- List the complications associated with dysphagia
- Describe the mechanics of a normal swallow
- List signs of swallowing problems
- Define silent aspiration
- Identify screening tools for dysphagia
- Explain the purpose and goals of dysphagia management
- Identify the signs and risks for malnutrition
- Explain the indications, risks and benefits related to enteral nutrition
- Summarize proper feeding strategies
- Explain the importance of and methods for oral care

5.1 Swallowing Post-Stroke: Dysphagia

Dysphagia is a significant consequence of stroke. Optimal stroke care includes identifying and managing dysphagia.

Key Points about Dysphagia:

- Any difficulty in moving food or liquid from the mouth to the stomach, including difficulty chewing
- Characterized by sensory and/or motor disturbances in the swallowing mechanism
- Signs of swallowing difficulty include choking, coughing, change in voice quality, excess drooling, and the inability to manage secretions
- Presentation is varied and difficulty can occur in one or more of the swallowing phases
- Risk increases with advancing age

- Can be complicated by impairment of cognitive awareness, visual recognition of food/drink, as well as physiological responses to the smell of food/drink

The published estimates of the incidence of stroke-related dysphagia vary widely from 29% to 67% in the acute stage of stroke, depending on the lesion location, timing and selection of assessment methods (Teasell et al., 2020). Approximately 1/3 of patients with stroke-related dysphagia will experience aspiration, or direct entry of food or liquid into the airway. Dysphagia may resolve in some patients but can be longstanding in others.

From the Canadian Stroke Best Practices Recommendations for Acute Stroke Management and the *Registered Nurses Association of Ontario (RNAO): Stroke Assessment across the Continuum of Care*, 2011, p. 18:

Nurses in all practice settings who have the appropriate training should screen ideally, on the day of admission or within 24 hours of the client becoming awake and alert for risk of dysphagia using a valid screening tool. Screening should be completed before oral and fluid intake (including medication). This tool should also be completed with any changes in neurological or medical condition, or in swallowing status.

**NOTE the difference between these two terms:*

***Dysphasia/Aphasia** is a language disorder in which there is an impairment of the comprehension and expression of language.*

***Dysphagia** is a medical term defined as “difficulty swallowing.”*

In situations where impairments are identified, clients should be kept NPO and referred to a Speech-Language Pathologist or other trained dysphagia clinician for further assessment and management.

Stroke can affect one's ability to eat or swallow when:

- Function of the muscles involved in feeding, swallowing or breathing is altered
- Sensation from the mouth and throat is altered
- Alertness and attention to eating are diminished
- Ability and/or Independence for self-feeding may be limited

Complications Associated with Dysphagia

Dysphagia can have a serious impact on one's health, leading to other serious conditions such as:

- Airway obstruction
- Aspiration pneumonia
- Malnutrition
- Dehydration
- Reduced quality of life
- Death

Quick facts:

In total, more than 200,000 people suffer from dysphagia in Canada at any given time

Visible signs of swallowing difficulty exist in 80% of the institutionalized elderly

The risk of developing aspiration pneumonia in the stroke survivor is 7x greater when dysphagia is present (Singh and Hamby, 2006)

The cost of treating pneumonia in Canada has been estimated at \$1,000 per day of hospitalization (Steele et al, 2008)

Inadequate energy and protein intake are highly prevalent in stroke patients. The majority of stroke patients do not consume their estimated requirements. Reduced intake may result from dysphagia, fatigue, depression, inability to communicate preferences, and/or a reduced ability to self-feed.

Identifying malnutrition in stroke patients is critical; Published studies indicate that between 8-32% of acute stroke patients admitted to hospital are malnourished (Dale, Kijak, & Foley, 2013).

Malnutrition increases the risk of pneumonia and other infections.

Malnutrition after stroke is associated with poor long-term outcome (i.e., decreased functional status, physical decline, increased length of stay in hospital etc.). Risk factors for development of malnutrition post-stroke Include:

- History of smoking
- Advanced age
- Female gender
- Residential care

For more information, refer to the *2022 Canadian Best Practice Recommendations for Acute Stroke management: 9.6 - Nutrition and Dysphagia*.

Dehydration and Stroke

Patients with swallowing problems may fear choking and avoid drinking fluids. Patients who fear incontinence may decrease their fluid intake in an attempt to prevent accidents, while others may be unable to communicate that they are thirsty.

- Dehydration increases the risk of falls, infection (urinary tract), constipation, and deep vein thrombosis and fatigue, thereby reducing the ability to participate in rehabilitation
- Patients who require help eating or drinking, or who refuse fluids at meals, or are on thickened fluids are at an increased risk for dehydration.
- Signs of dehydration include dizziness upon standing (hypotension), confusion or change in mental status, rapid weight loss, dry mouth and/or tongue and thick stringy saliva, decreased urine output, and dark concentrated urine.

Hydration and Thickened Fluids

Stroke patients on thickened fluids are at increased risk of inadequate fluid intake, which leads to dehydration. This is due to the reduced level of free water content in the thickened fluids and overall reduced total fluid intake. Stroke patients need to be encouraged to consume the thickened fluids on their meal trays.



Consult the *Dietitian* if there is a concern on the amount of fluids your patient is consuming, or if the patient is at risk of malnutrition.

Tips to prevent dehydration of malnutrition

- Have appropriate liquids available to the patient at all times
- Encourage fluid intake at meals - take a sip between bites
- Offer beverages with snacks
- Encourage plenty of fluids with medications
- Consult with the *Dietitian* for options that may address patient preferences
- Follow up *Speech-Language Pathologist* to monitor for any texture upgrades that are appropriate for patients on thickened fluids

Goals of Dysphagia Management

- Maximize nutrition and hydration
- Protect airway from obstruction
- Protect airway from aspiration of saliva, food and liquid
- Manage reflux
- Control oral bacteria through a sage oral care plan
- Establish a consistent, safe route for oral medication
- Monitor and maintain fluid intake for hydration

*Dysphagia management is the key to preventing aspiration and aspiration pneumonia. If any signs of dysphagia are noted, a dysphagia screening should be completed, and as appropriate, the patient should be made NPO until the Speech-Language Pathologist or Physician is available for consult.

5.2 Normal Swallow

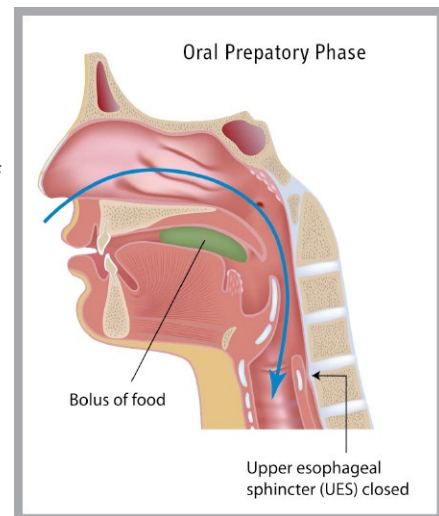
Swallowing is a semi-automatic motor event that involves preparation and the movement of the ingested food, fluids and saliva from the mouth to the stomach. Across the activities of eating and salivary secretion, the average adult swallows 1500 times per day. While awake, an adult swallows once every 60-120 seconds.

A normal swallow has four phases:

1. Oral Preparatory Phase
2. Oral Transport Phase
3. Pharyngeal Phase
4. Esophageal Phase

1. Oral Preparatory Phase

- The initial stage whereby food and drink are brought to the mouth, and the lips anteriorly and contact between the back of the tongue and the soft palate posteriorly
- Food is chewed and mixed with saliva to form a bolus (ball of food)
- Under voluntary control
- Duration of this phase is dependent on the amount of preparation that is needed to form a cohesive bolus

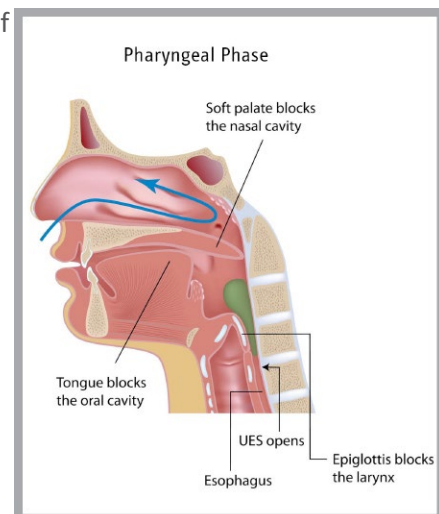


2. Oral Transport Phase

- Bolus is delivered by voluntary tongue movement to the back of the mouth, into the pharynx
- Arrival of bolus at the back of the mouth triggers the pharyngeal phase of the swallow

3. Pharyngeal Phase

- Bolus is delivered to the esophagus by action of the base of tongue and muscles of the pharynx
- Involuntary/reflexive phase
- Soft palate raises to seal off the nasal cavity
- Pharynx and larynx move up to protect the airway and direct the bolus to the esophagus
- Under sphincter of the esophagus (UES) relaxes, allowing the bolus to enter the esophagus



4. Esophageal Phase

- Involuntary/reflexive
- UES closes as the bolus passes through
- Peristalsis pushes the bolus down into the stomach
- Gravity also assists with bolus transportation

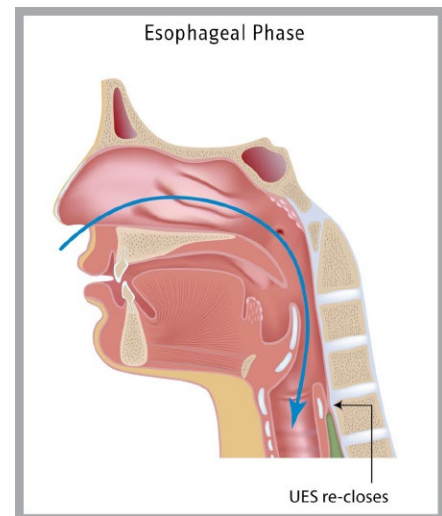
Signs of Swallowing Problems



It is important to notice these crucial signs that may indicate your stroke patient is having difficulty swallowing:

- Drooling
- Slow eating, prolonged chewing
- Food left in mouth after eating (e.g., residue or pocketing)
- Pain associated with swallow
- Effortful, strained swallowing
- Delayed initiation of swallow
- Coughing or choking during and/or after swallowing
- Throat clearing after swallowing
- Voice changes (i.e. wet/gurgly voice)
- Refusal to eat or drink
- Recurrent chest infections
- Unexplained weight loss
- Gagging
- Nasal regurgitation
- Shortness of breath
- Poor lip closure with loss of food from mouth
- Temperature spikes or the presence of a fever

(Heart and Stroke Foundation, Tips and Tools, 2010)



5.3 Aspiration

Aspiration or the entry of food, liquid and/or saliva into the airway below the vocal folds, is a symptom of impaired swallowing.

Aspiration can occur in the following situations:

- If the patient has difficulty containing food and liquids in the mouth during the oral preparatory phase, causing the material to spill into the pharynx prematurely
- If the patient is unable to move and close the larynx during the pharyngeal phase, and
- If the patient does not fully clear the bolus from the pharynx, and remaining food or liquid enters the open airway

Bacteria in saliva, foods and liquids, or refluxed material from the stomach can enter the airway. It can lead to symptoms of choking or breathing problems. If this material enters the lungs, it can cause an infection, typically aspiration pneumonia.

Martino et al., (2005) found that patients with dysphagia after stroke have a 3 times greater risk of pneumonia than stroke patients without dysphagia, and when those dysphagia patients were confirmed to aspirate during swallowing, their relative risk pneumonia was 11 times greater. However, aspiration alone is not sufficient to cause pneumonia (Teasell et al., 2020).

Incidence of aspiration in stroke

- The incidence of aspiration during the acute stage of stroke ranges from 16% to 51% (Iruthayarajah et al., 2019). Silent aspiration occurs in 8% to 27% of acute stroke patients (Iruthayarajah et al., 2019).
- As many as 20% of individuals with stroke-related dysphagia die during the first-year post-stroke from aspiration pneumonia (Iruthayarajah et al., 2019)
- Patients with infarctions of the brain stem, multiple strokes, major hemispheric lesions or depressed consciousness are at increased risk of aspiration (AHA, 2013 – Acute Guidelines)
- An abnormal gag reflex, impaired voluntary cough, dysphonia (wet voice), incomplete oral-labial closure, a high NIHSS score, or cranial nerve palsies should alert the interprofessional team to the risk of dysphagia
- A preserved gag reflex may not indicate safety with swallowing

A Few Words about Reflexes...

Absence of a gag reflex does not predict dysphagia

Presence of a gag reflex does not protect against aspiration

The cough reflex can be impaired or absent, so silent aspiration may occur

Silent Aspiration

Coughing is a physiologic response to aspiration in normal healthy individuals, but aspiration is not always accompanied by obvious, outward symptoms such as coughing or breathing difficulty. Silent aspiration means there are no clinical signs of aspiration (no coughing or throat clearing). When foreign materials are aspirated into the subglottic area (Lee et al., 2014). It is very common. In fact, lack of coughing is prevalent in 40% of aspirators (Logemann, 1983).

When silent aspiration is occurring, it is not until respiratory complications occur that we realize the patient has been aspirating.

How do you detect silent aspiration?



When a stroke patient presents with high risk of aspiration, temperature, fever, white blood cell count, and respiratory status should be closely monitored to detect any new infection.

Silent aspiration is difficult to detect at bedside because the patient will not cough or clear their throat. When silent aspiration is occurring, it may not be until respiratory complications occur that one realizes the patient has been aspirating. Detection requires videofluoroscopic swallow study (VSS, VFSS) or fiberoptic endoscopic examination of swallowing (FEES).

Remember chest x-ray key terms:

Consolidation – the lung is filled with liquid or a mark of swelling/ hardening of normal soft tissue

Infiltrate – abnormal substance has infiltrated the lungs

Atelectasis – a collapse or closing of the lung resulting in reduced or absence gas exchange

Pleural effusion – excess fluid that accumulates between the two pleural layers, the fluid-filled space that surrounds the lungs

5.4 Dysphagia Screening

What is a screening tool?



A swallowing/dysphagia screening tool indicates likelihood of the presence or absence of dysphagia and identifies patients who require a referral to a *Speech-Language Pathologist* for a full swallowing assessment.



The *Stroke Assessment across the Continuum of Care* (RNAO, 2005, 2011), suggests that a dysphagia screening tool contains the following:

- Assessment of the client's alertness and ability to participate
- Direct observation of the oropharyngeal swallowing difficulty (choking, coughing, wet voice)
- Assessment of tongue protrusion
- Assessment of pharyngeal sensation
- Assessment of voice quality
- Administration of a 50mL water test
- Evaluation of the patient's voice quality, oral motor, oral sensation, and ability to cough
- Trials of water using a present protocol

What are some examples of swallowing screening tools?

Massey Bedside Swallowing Screen

The Massey Bedside Swallowing Screen is a 14-point screen that examines alertness level, dysarthria, aphasia, oral motor abilities, gag reflex, and incorporates a one teaspoon water swallow followed by a 60mL water swallow.

Timed Test of Swallow and Questionnaire

Each patient answers a standard questionnaire related to his or her swallowing. If swallowing, the patient undergoes a limited timed test. The timed test involves 5-10 mL of water from a teaspoon. Patients choking on this amount do not proceed to the full test and are recorded as an abnormal test. If the patient passes then 50- 100 mLs of water is given and the patient is asked to drink the water as quickly as possible. Any residual water is measured as are the number of swallows. The test is abnormal if either the quantitative or the qualitative aspects of the swallow are outside the normal limits.

Toronto Bedside Swallowing Screening Test (TOR BSST)

The TOR BSST screen includes 4 clinical test items: dysphonia, 'voice before' and 'voice after', tongue movement, and water swallows using a preset protocol.

Screening Tool for Acute Neurological Dysphagia (STAND)

The STAND screening tool evaluates patients' alertness and oxygen saturation levels, voice quality and ability to manage oral secretions, and history of dysphagia. It also includes a swallow challenge with pureed foods and water and while the assessor observes for specified signs of impaired swallowing.

Standardized Swallowing Assessment (SSA)

SSA consists of a general evaluation (e.g., conscious level, postural control) in order to ensure the patient is physically capable of undertaking screening. The screening tool then assesses the patient's breathing, voice control, saliva control, as well as his or her ability to cough, sip water from a spoon, and drink water from a glass.

The Barnes-Jewish Hospital Screen

The Barnes- Jewish Hospital Screen assesses consciousness, dysarthria and has a 3-ounce water trial to identify any signs of aspiration.

*Refer to the screening tool used in your organization

5.5 Managing Dysphagia and Feeding Your Stroke Patient

Dysphagia Diets



Those who have been identified as having dysphagia following an assessment by an appropriately trained professional, may have modified texture (e.g., pureed solids) or consistency (e.g., thick fluids) recommendations. There may be differences in diet classifications between organizations. For some rehabilitation organizations, the International Dysphagia Diet Standardization Initiative (IDDSI) which provides a framework that supports common terminology to describe food textures and drink thickness, that may be in place.

The Dietitian will ensure that the patient diet order is appropriate for the individual patient. The Speech-Language Pathologist will provide ongoing dysphagia assessment and management, including diet texture changes as needed.

Nutrition Support: Enteral Nutrition

Stroke patients with suspected nutritional concerns, hydration deficits, dysphagia, or other comorbidities who may require nutritional intervention (such as diabetes) should be referred to a *Dietitian* for recommendations:

- a. To meet nutrient and fluid needs orally while supporting alterations in food texture and fluid consistency recommended by a *Speech-Language Pathologist* or other trained professional
- b. For enteral nutrition support in patients who cannot safely swallow or meet their nutrient and fluid needs orally
- c. The decision to proceed with tube feeding should be made as early as possible after admission, usually within the first three days of admission in collaboration with the patient, family (or substitute decision maker), and interprofessional team

Short-term nutrition support: Nasogastric (NG) Feeding Tube

For patients, who cannot safely swallow or meet their nutrient and fluid needs, enteral nutrition such as nasogastric (NG) tube feeding should be considered with consultation with the patient, family and Interdisciplinary as early as possible (*Refer to CSBPR Rehabilitation and Recovery Following Stroke Module -Section 7- Dysphagia screening, assessment and management*). NG feeding tubes are used for short-term nutrition support. They allow an immediate route for nutrition, hydration and most medications. The average use is less than 4 weeks and the nares should be checked periodically for breakdown and soreness.

Common benefits of using NG tube:

- Provides immediate route to provide nutrition, water, and medications
- Allows patient to be nourished and hydrated when some recovery of swallowing ability is expected within a short-time period (1-3 weeks)

Common risks of using NG tube:

- Patient may pull NG out, as it is easily accessible; hands may be restrained
- Smaller tubes clog more easily
- May cause reflux, possible aspiration pneumonia
- May cause an increase in secretions and sinusitis
- Not all medications can be put through an NG tube

*If no progress in 1-3 weeks, long tube feeding options should be considered

Long-term nutrition support

Nasogastric feeding tubes should be replaced by gastric-jejunum tube (GJ-tube) if the patient requires a prolonged period of enteral feeding (greater than 2-3 weeks), based on the prognosis for recovery and whether this is in line with the patient's expressed wishes and overall goals of care.

Feeding Your Stroke Patient

Feeding is a skill that requires knowledge and experience. Safe, low-risk feeding practices should be used with all patients, but are especially important with patients requiring full feeding assistance. Consult SLP for individualized safe swallowing for each patient. This helps to prevent serious health problems and improve the quality of the experience for the patient.

Nurses should consider the placement of food in front of the stroke survivor to accommodate for neglect. Refer to *CSBPR Rehabilitation and Recovery Following Stroke Module - Section 8 Rehabilitation of Visual and Perceptual Deficits* for further information.

Patient Positioning

- Sit fully upright drinking

Support person Positioning

- Sitting down and at eye-level with the patient
- Sitting across from the patient, slightly to the side that allows ease of feeding (e.g., If the support person is left handed, position to be on the patient's left side)
- Support person should be comfortable
- Do not feed from above the mouth

Feeding Strategies

- Always check in with the nurse about the patient's diet, both food textures and liquid consistency.
- Check the tray to ensure the correct diet has been provided.
- Review any specific swallowing strategies that may be in place – check for signage at the bedside.
- Liaise with the *Occupational Therapist* or *Speech-Language Pathologist* for use of assistive devices.
- Ensure that the appropriate utensils to support safe feeding

are available (e.g., teaspoons, special cups)

- Involve patient in choices (e.g., ask, 'what would you like next?')
- Inform patient what food they are eating; preferably do not blend foods together.
- Feed at a relaxed pace
- Ensure stroke survivor has swallowed before giving the next bite, watch the swallow
- Before the next bite, check to see if there is any pooling in the mouth. Ensure this is cleared before continuing
- Allow for extra time before giving the next bite/sip
- Provide small amounts at a time (e.g. half to one teaspoon at a time) - look for any specific recommendations provided for the individual
- Reduce distractions
- Discourage the individual from talking when there is food or liquid in their mouth
- Engage in conversation once their mouth is empty, as this is a way to check vocal quality (listen for wet voice)
- Use hand-over-hand support with dysphagic patients who cannot self-feed if appropriate; consult with the *Occupational Therapist*
- Cue stroke survivor to feed on the strong side of their mouth (e.g., present utensil or cup to non-affected side), if this does not contraindicate any therapy plan or swallowing recommendations that have been provided.
- Provide one pill at a time, in the appropriate liquid or semi-solid consistency. If crushing is required, ensure that the pill is crushable
- Keep the patient upright for at least 30 minutes after the meal to reduce the risk of aspiration from residue in the oropharyngeal tract
- Complete oral care after each meal

Dangerous Practices

The following practices may have significant clinical consequences, including aspiration or dehydration, for stroke survivors with dysphagia:

- Feeding someone who is not alert
- Syringe feeding
- Feeding in a fully or partially recumbent position
- Giving pills with water to a patient on a 'no thin fluids' diet
- Unnecessarily restricting diet to thick or puree solids
- Feeding with a tablespoon rather than a teaspoon
- Giving anything not approved in the diet; inform family, other staff members, and visitors to check with the nurse as to whether specific food items are permitted before providing them to the individual

Stroke survivors who are fed by others are at an increased risk of aspiration, so survivors should be encouraged and assisted to feed themselves when possible.

The stroke survivor can be taught to:

- Monitor self-feeding with a mirror
- Remove pocketed food with tongue
- Be aware of drooling; encourage use of napkin
- Remain upright at least 30 minutes after meal
- Swallow twice; encourage coughing to clear the throat
- Perform oral care before and after meals

The Occupational Therapist or Speech-Language Pathologist can recommend the best devices for a patient to assist with self-feeding.

Other Considerations

Weight

It is important that all stroke patients are weighed upon their admission to the medical floor. This will serve as a baseline weight so that the *Dietitian* can determine that any weight loss is occurring during their hospital stay. Weights can be recorded in the patient's chart and recommended to be taken on a weekly basis.

Intake Records

Food intake records can be ordered by the *Physician* and/or *Dietitian* for a set number of days to better determine if a stroke patient's oral intake is meeting their estimated nutritional needs. Use the menu tickets, if available, on a patient's meal tray to mark the approximate amount of each food/fluid consumed. In some centres, these menu tickets are kept on the front of the patient's chart for the *Dietitian* to view. Ensure all food/fluid consumed during and in between meals/snacks is recorded

5.6 Oral Care

The healthy mouth is colonized by a variety of nonpathogenic bacteria bathed in saliva. Saliva production, which is stimulated by chewing, maintains a neutral oral pH, prevents dental caries, and flushes bacteria out of the mouth, thereby suppressing oral colonization by pathogenic bacteria and fungi. Oral health depends on adequate fluid intake, nutrition, saliva production, oral hygiene and mastication ability (HSF, 2006)

Poor oral health can lead to several problems including gum disease. Bacteria from diseased gums may travel through the bloodstream and cause infections. Bacteria and food particles in the mouth can be especially dangerous if aspirated into the lungs, potentially causing aspiration pneumonia (HSF, 2006). The Canadian Stroke Best Practice Recommendations (Teasell et al., 2020) state that patients should be given meticulous mouth and dental care and educated in the need for good oral hygiene to further reduce the risk of pneumonia.

Effective oral care involves manual scrubbing (e.g., use of toothbrush and oral suction if indicated based on aspiration risk) of the entire oral cavity. This includes:

- Entire oral mucosa
- Upper and lower teeth
- Sulci (spaces between the cheeks and gums)

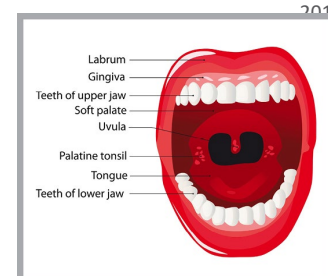
If the patient has dentures, these should be removed, and cleaned. Oral care continues to be required in patients even if they are edentulous.

Use a flashlight to help visualize debris in the back of the oral cavity. Often secretions collect and harden on the back part of the tongue and coat the part of the throat that is visible. It is helpful to have oral suction on hand in these cases and a partner when performing oral care.

TIP: As part of oral care provision, for those stroke survivors with prolonged NPO status, consider the use of oral moistening sprays or gels to help maintain the oral cavity moist and provide relief from dryness.

Oral care is important for all stroke survivors. Stroke can result in a reduced level of consciousness, physical weakness, and/or cognitive changes that interfere with an individual's ability to independently complete oral care. Those who are at greatest risk for complications from suboptimal oral care include patients who are:

- Unconscious
- NPO
- Have minimal oral intake (e.g., receiving one item per meal)
- Have impaired oral sensation



Consider consulting
Dentistry,
Occupational
Therapy, Speech-
Language
Pathologists,
and/or a *Dental*
Hygienist to
develop an oral
care protocol
(National Stroke
Nursing Council,
2010).

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