ASPIRATION: RISKS, RECOGNITION, AND PREVENTION

INTRODUCTION

Aspiration is defined as the movement of a foreign substance into the lungs. Aspiration is very common and it can cause significant and serious complications. Recognizing factors that increase the risk for aspiration, knowing which patients are most likely to aspirate, and understanding the signs and symptoms of aspiration are essential to your practice as a Certified Nursing Assistant (CNA).

STATEMENT OF PURPOSE

This module will provide CNAs with the information they need to recognize and prevent aspiration.

SWALLOWING AND THE GAG REFLEX

Aspiration is intimately related to swallowing and the gag reflex so to understand aspiration you must be familiar with these normal physiological functions. The cough reflex is also involved in aspiration and that will be discussed briefly in another section of the module.

The Upper Gastrointestinal Tract and Its Associated Structures and Swallowing

Swallowing is the coordinated movement of food or liquids from the mouth to the stomach and it can best be understood by dividing it into two phases, voluntary and involuntary. Swallowing will be explained in terms of solid food but the process is essentially the same for liquids.
Prior to outlining the process of swallowing, the basic anatomy of the structures of the upper gastrointestinal tract and structures involved in the process of swallowing and aspiration prevention will be reviewed.

**Oral cavity**: The gastrointestinal tract starts with the mouth, which is also called the oral cavity. The oral cavity is the beginning of both the respiratory tract and the gastrointestinal tract. In terms of swallowing the primary function of the oral cavity is to begin the digestion of food and to break down food into manageable sizes.

**Pharynx**: The next section of the gastrointestinal tract is the pharynx, a relatively short tube made of muscle and connective tissue that is located behind the larynx. The pharynx connects the oral cavity to the esophagus and the pharynx is comprised the nasopharynx, the oropharynx, and the laryngopharynx. The primary functions of the pharynx are to allow passage of food and liquid into the esophagus and air into the trachea.

**Esophagus**: The esophagus is a thick-walled tube of muscle and cartilage that is located behind the larynx and the trachea. The esophagus connects the pharynx to the stomach and like the pharynx, its primary function is to allow for the passage of food and liquids. The esophagus has two sphincters, the upper and lower esophageal sphincters. A sphincter is a ring of muscle that can open and close and there are many sphincters throughout the body: the anal sphincter is
an example. The upper esophageal sphincter is located at the junction of the pharynx; the lower esophageal sphincter is located at the juncture of the esophagus and the stomach. The esophageal sphincters are not under voluntary control and except during swallowing, they are normally closed.

**Epiglottis**: The epiglottis is a flap of cartilage that is attached to the upper part of the larynx. One end of the epiglottis is attached to the larynx (This attachment can be thought of as a hinge) and the other end projects backwards up and behind the tongue. The epiglottis has a vital role in normal swallowing and the prevention of aspiration, and this will be discussed in the next section of the module. The epiglottis is above the glottis, which is the opening between the vocal cords.

**Figure 1: The Upper Gastrointestinal Tract**

Oral Cavity  ↓  Pharynx  ↓  Esophagus  ↓  Stomach

**Larynx**: The larynx is the initial section of the respiratory tract. It is a short tube of muscle and cartilage that begins in the oral cavity and connects to the trachea (commonly known as the windpipe). The larynx is relevant to this module because the larynx is where coughing
is initiated and coughing is an important protective reflex that keeps foreign bodies from entering the lungs.

**Swallowing**

**Voluntary phase:** Swallowing is for the most part an automatic process; we don’t have to think about swallowing as it happens. However, the initial phase of preparing the food for swallowing and the beginning of swallowing is under voluntary control.

The voluntary phase (also called the oro-pharyngeal phase) of swallowing begins in the oral cavity by lubrication of the food with saliva and digestive juices and chewing the food into small pieces that can pass through the upper parts of the gastrointestinal tract; these small pieces of food are called **boluses**.

**Involuntary phase:** After food has been chewed and lubricated, the lips close to seal the mouth and the tongue moves the bolus to the back of the oral cavity and into the oropharynx. At this point the involuntary phase (also called the esophageal phase) of swallowing begins. As the food bolus or liquid reaches the oropharynx a series of coordinated movements begin to push the food/liquid smoothly through the upper gastrointestinal tract and into the stomach. When examined in detail this process has many steps but it can be explained quite simply. Although the swallowing process is presented here step-by-step, all of these actions happen essentially at the same time.
Figure 2: The Process of Swallowing

1. The pressure of the food bolus in the pharynx causes the muscles of the pharynx to contract and to move the food away from the mouth and into the pharynx.

2. The uvula contracts and covers the opening of the nasopharynx, preventing food from entering the nasal passages.

3. Laryngeal movement: Once the food bolus or liquid reaches the back of the oral cavity, the larynx moves upward. This helps close the glottis and prevents food from passing through the vocal cord and into the trachea.

4. The movement of the epiglottis: At the same time that the larynx is moving upward to close the glottis, the epiglottis swings down and covers the opening of the larynx, acting like a cover. This prevents food/liquid from entering the trachea.

5. Sphincter relaxation: The esophageal sphincter relaxes, providing access to the esophagus.

6. Peristaltic action: Once the food or liquid enters the esophagus it is moved along by involuntary rhythmic muscles actions called peristalsis. Because the esophagus is essentially a closed tube, pressure on any part of the esophagus will move food/liquid in the direction of least resistance.
case, towards the lower esophageal sphincter and the stomach. A useful way to think of this is to imagine squeezing an open tube of toothpaste; when you do so the contents will be moved out through the opening and peristaltic contractions in the esophagus function in the same way.

7. The lower esophageal sphincter relaxes and allows for passage of the food bolus or liquid into the stomach.

During the process of swallowing any other physiological action that involves the oral cavity, the pharynx, the larynx, or the esophagus cannot be done. When you are swallowing you cannot inhale, exhale, talk, vomit, or cough.

When you review the process of swallowing, two things are prominent and have particular relevance to the topic of aspiration.

- The gastrointestinal tract and the respiratory tract are in close proximity: at certain points there is very little that separates them.

- Swallowing requires the coordinated action of many muscles, nerves, and reflexes; it is a relatively complicated act.

When you consider those two points you will realize that there is considerable potential for food or liquid to be aspirated, and that there
are many steps in the process of swallowing that can break down and put a patient at risk of aspiration.

**GAG REFLEX AND COUGH REFLEX**

The gag reflex and the cough reflex protect the lungs from aspiration and entry of foreign objects. The gag reflex involves the oral cavity and the upper part of the gastrointestinal tract; the cough reflex involves the upper part of the respiratory tract. The gag reflex, which is more formally called the pharyngeal reflex, is the most important protective mechanism for the prevention of aspiration and it will be discussed in detail.

The gag reflex occurs when a foreign object touches the roof of the mouth, the back of the tongue, the areas around the tonsils or the uvula, or the oropharynx. During normal swallowing food and liquids contact these areas but aspiration is prevented by the automatic closing of the epiglottis. This protective mechanism is absent during a potential aspiration situation but the gag reflex takes over and stops foreign objects from entering the lungs. Nerve endings located in the roof of the mouth, the back of the tongue etc. are stimulated by the physical contact with food/fluid and this stimulation initiates very strong, forceful contractions of the pharynx and the foreign body is expelled. The patient experiences the gag reflex as coughing, choking, and gagging.
**Learning Break**: An easy way to imagine the gag reflex is to remember an experience we have all had, one that is commonly called “having something go down the wrong way.” A piece of food or some liquid reaches the back of your mouth and you begin to gag and cough.

An intact functioning gag reflex is essential to prevent aspiration. However, it has been estimated that the gag reflex is absent in almost 30% of the population and some people may have a gag reflex but it is not very strong. In addition, there are many diseases and medical conditions that can temporarily or permanently damage the gag reflex, making someone susceptible to aspiration.

The **cough reflex** is also important for preventing aspiration. The primary function of the larynx and trachea is to move air into the lungs and the respiratory tract and any foreign substance that enters the airways interferes with respiration and is a potential cause of infection. Nerve endings located on the larynx and the trachea are stimulated when a foreign body enters the larynx or trachea, a forceful cough is produced, and the foreign object is expelled.

**ASPIRATION: THE CAUSES, SIGNS AND SYMPTOMS, AND CONSEQUENCES**

Aspiration occurs when the gag reflex and the cough reflex fail to prevent a foreign substance from entering the lungs. The common
conception of aspiration is that it is an abnormal and dramatic pathologic event that causes coughing, choking, and a serious complication such as pneumonia. This is certainly true for some aspirations. But aspiration is actually a common event and it may not result in harm. Studies have shown that at least one-half of all adults aspirate during sleep and the aspiration does not wake them up or cause signs and symptoms. However, these aspirations are happening to normal healthy adults who have a functioning gag reflex and they are aspirating very small amounts of saliva, mucous, and (possibly) gastric juices. The aspirations that result in serious harm are occurring to a very different population, under very different circumstances, and with potentially serious consequences. Why and how are these aspirations harmful?

1. Volume: In patients who suffer, or who may suffer a harmful aspiration there is often a large volume that enters the lungs. An example of this would be the patient who has aspirated tube feedings. A milliliter or two would be tolerated but 30 ml or more (This figure is not exact, it is simply an example) would cause signs and symptoms. However, it is important to realize that the larger the volume the greater the potential harm but a serious aspiration can occur from a small amount.
2. Substance: If the aspirate contains infectious bacteria the patient may develop aspiration pneumonia.

3. Frequency: If aspirations are happening again and again the respiratory tract and the lungs are subjected to more frequent stress and the patient has less time to recover.

4. Patient issues: There are many individual factors that influence how often aspirations occur and whether or not these aspirations cause complications. Examples include patients who have a decreased level of consciousness, patients who have a compromised immune system, or patients who have a respiratory illness such as pneumonia or chronic obstructive pulmonary disease (COPD) that decreases the oxygen content of the blood. In all of these situations, someone is more likely to aspirate or more likely to suffer harm from an aspiration.

There are many causes of aspiration and a list of these is provided in Table 1. This list is not all-inclusive.

**Table 1: Causes of Aspiration**

- Cerebral vascular accident (Stroke)
- Drug or alcohol overdose
- Dysphagia
- Excessive production of oral secretions
- General anesthesia
- Grand mal seizure
- Mechanical ventilation
- Nasogastric feedings
Neurologic diseases
Prolonged vomiting
Sedative, hypnotic, or opioid medications
Tracheostomy
Traumatic brain injury

As mentioned previously, this list is not all-inclusive and it also contains some overlap: many people who have a stroke develop dysphagia.

You can certainly study this list and refer back to it from time to time. However, it is more useful to see that these causes of aspiration have similarities. Understanding this will help you to recognize patients who are at risk for aspiration. These similarities are:

1. The patient has a **depressed level of consciousness**. Someone who has a depressed level of consciousness often has a weak or absent gag reflex; you may have heard someone refer to this situation as a “patient who cannot protect her/his airway.” This can happen to a patient who has had a stroke, it can happen during a seizure, or it can be a consequence of an overdose.

2. **Protective reflexes are absent or compromised**: Examples of this would include a patient who has been endotracheally intubated or who has a tracheostomy; placement of a nasogastric feeding tube, or; the patient has dysphagia. (Note: Dysphagia will be discussed later in the module)
You have probably noticed, and experienced CNAs know that many patients have a depressed level of conscious and a loss of protective reflexes; the two frequently go together. For example, a patient who has had a stroke may be comatose and have a damaged gag reflex.

**Learning Break:** Dysphagia is a medical term that means difficulty in swallowing. Common neurological problems such as Alzheimer’s disease, stroke, and traumatic brain injury frequently cause dysphagia and dysphagia is a significant risk factor for aspiration. Dysphagia is very common; the authors of a recent article in the medical journal Chest noted that dysphagia is present in at least 30% of all hospitalized patients. Unfortunately, dysphagia often goes unrecognized.

**Signs and Symptoms of Aspiration**

The signs and symptoms of aspiration can be subtle or very clear and some patients can aspirate and initially be asymptomatic. The obvious signs and symptoms of aspiration are coughing, choking, and difficulty breathing and they often occur after a situation that puts the patient at risk: for example, a patient who recently had a stroke and is taking fluids by mouth for the first time begins to cough and gasp. Every experienced CNA would recognize this as a situation with the potential for aspiration risk and of course coughing and gasping can’t be missed.
But when the aspiration is slight, if the signs and symptoms are minor, or if the patient is initially asymptomatic recognizing as aspiration can be difficult. In these situations you must remember who is at risk for aspiration and be on the alert for clues that an aspiration has happened. These would include:

**Table 2: Signs and Symptoms of Aspiration**

- Change in consciousness, especially depressed consciousness
- Decreased oxygen saturation as measured by pulse oximetry
- Excessive drooling
- Fatigue
- Fever
- Increased sputum production
- Persistent, mild cough
- Rapid breathing
- Tachycardia
- Vomiting soon after meals

Of course, these are non-specific signs: there are many reasons why a patient may have a fever or a rapid pulse. But if these signs are present in a patient who has risk factors for aspiration then the possibility should be investigated.

**Learning Break:** Asymptomatic aspiration is also called *silent aspiration*, and it is especially worrisome. It cannot be detected without specialized testing, and patients who have silent aspirations are much more likely to develop aspiration pneumonia. Silent aspirations are not rare: one study found that 25% all patients who had a confirmed, documented aspiration had had a silent aspiration.
The Consequences of Aspiration

Aspiration can cause airway obstruction and interfere with ventilation; it can cause an inflammation of the lungs called chemical pneumonitis; it can cause aspiration pneumonia, and; it can cause a combination of these. Aspiration pneumonia is perhaps the most common of complication and it will be the focus of this module. Aspiration pneumonia occurs when a patient aspirates bacteria or other microorganisms from his/her oral cavity, nasal passages, or upper stomach. These microorganisms are part of the normal flora of the upper respiratory tract and the gastrointestinal tract, but if they enter the lungs they can multiply and then they are not benign. If these oral, nasal, or gastric nasal secretions contain a large number of microorganisms, if the aspirations are frequent, or if the patient is susceptible to a respiratory infection, aspiration pneumonia can develop. It is important to remember that the size of the aspiration is not important - aspiration pneumonia can occur even after a very small aspiration - and that aspiration pneumonia can be caused by a silent aspiration. Pneumonia occurs in approximately one-third of all patients who aspirate.

The exact incidence of aspiration pneumonia is not known but it is a relatively common problem. It is especially prevalent in the elderly population, quite common in the elderly who have dysphagia and in
elderly people who are hospitalized, and for the latter group it is also very dangerous; one study found the mortality rate of hospital-associated aspiration pneumonia to be almost 30%.

The signs and symptoms of aspiration pneumonia vary considerably and depend on how recently the aspiration happened, the patient’s basic state of health, and the virulence of the microorganism. Common clinical problems that are seen are drowsiness, fever, rapid breathing, and tachycardia. If the patient is elderly and dehydrated, she/he may be hypotensive, as well. It is also possible for the patient to have relatively mild signs and symptoms for a few days as the aspiration pneumonia develops.

Aspiration pneumonia is diagnosed by examining the patient, by recognizing risk factors for aspiration, and most definitively by chest x-ray. Laboratory studies and the examination/culture of sputum have limited usefulness in diagnosing aspiration pneumonia. Aspiration pneumonia is treated with antibiotics and fluids.

**PREVENTING ASPIRATION**

As with any medical problem or disease prevention is far better than treatment. Aspiration prevention is considered to be a key component of good health care, and it involves identifying patients who are at risk and then using practical methods to ensure that patients do not aspirate.
Identifying Patients at Risk for Aspiration: Screening Methods

Aspiration prevention is considered to be a key component of good health care. The Agency for Healthcare Research and Quality (AHRQ) is an agency of the National Institutes of Health, and the AHRQ recommends as one of its 30 Safe Practices for Better Health Care that all patients be screened for aspiration. To quote the AHRQ: “Upon admission, and regularly thereafter, evaluate each patient for the risk of aspiration.” Evaluating stroke patients within 24 hours of admission for their risk of aspiration and the presence of dysphagia is also typically recommended.

Prevention of aspiration begins with recognizing patients who are at risk for this problem and this has been shown to be both simple and difficult. The simple part is identifying which patients are likely to suffer an aspiration. This was covered in a previous section of the module and it can be easily summarized. If the answer is yes to any of these questions then the patient is at risk for aspiration.

Table 3: Basic Screening for Aspiration Risk

- Is the patient elderly?
- Is she/he receiving any medications that can cause sedation?
- Does the patient have a neurological disease or disorder?
- Does the patient have excess secretions?
- Was general anesthesia recently used?
- Does the patient have obvious difficulty eating/swallowing?
- Is he/she unable to sit upright?
- Has the patient has a prior aspiration?
- Does she/he have a history of dysphagia?
• Does the patient have a depressed level of consciousness?

This basic assessment should be done for all patients and for patients who are especially susceptible to aspiration it should be repeated from time to time. Most healthcare facilities will have an aspiration screening tool and a protocol for how and when to use it.

There are bedside and technical-based screening methods that can be used for detecting aspiration and for detecting one of its most common causes, dysphagia. Unfortunately, there is no universal agreement as to which one is best and when they should be used and that is the part of aspiration/dysphagia screening that is difficult. Explaining all of these screening methods is beyond the scope of this module but commonly used ones are listed in Table 4. The EAT-10 can be done at the bedside without specialized equipment and it will be briefly discussed.

**Table 4: Screening Methods for Detecting Aspiration/Dysphagia**

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<th>Method</th>
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<td>Barium swallow test</td>
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<td>EAT-10</td>
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<tr>
<td>Endoscopy</td>
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<tr>
<td>Video-fluoroscopic evaluation (VSE)</td>
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<td>Water swallow test</td>
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All of these except the EAT-10 are technical tests while the EAT-10 is a questionnaire that can be used to determine the need for more complicated screening. The EAT-10 asks the patient to respond to these 10 statements.
Table 5: The EAT-10 Questionnaire

1. My swallowing problem has caused me to lose weight.
2. My swallowing problem interferes with my ability to go out for meals.
3. Swallowing liquids takes extra effort.
4. Swallowing solids takes extra effort.
5. Swallowing pills takes extra effort.
6. Swallowing is painful.
7. The pleasure of eating is affected by my swallowing.
8. When I swallow food sticks in my throat.
9. I cough when I eat.
10. Swallowing is stressful.

The answers to the questions are scored on a scale from 0 – 4, no problem to severe, and if the total score is 3 or higher the patient may have a swallowing problem and more aggressive evaluation should be considered.

PRACTICAL METHODS FOR THE PREVENTION OF ASPIRATION

If a patient has been identified as being at risk for aspiration or if the patient has aspirated then practical methods designed to prevent this from happening should be started.
The first step is to use the aspiration evaluation protocol that your healthcare facility has adopted. You should also keep in mind the questions that are listed in Tables 2 and 3.

Specific measures for preventing aspiration include: 1) patient positioning; 2) oral care; 3) assessment of nasogastric tube placement; 4) tube feeding technique; 5) measuring residual gastric volume, and; 6) avoiding the use of sedating drugs.

Each health care facility will use these preventive measures in a different way and some of them may not be used at all at your workplace, so it is not possible to provide strict, definitive guidelines for their use. Follow the in-place protocols of your workplace and if you have doubts about what to do ask your supervisor

**Positioning**: Elevating the head of the bed is a very effective method for preventing aspiration. Lying flat or with the head slightly elevated increases the possibility of aspirating, especially so if a patient has an absent/weak gag reflex or is receiving feedings by a nasogastric tube. (Remember; one the first things we all do when food or liquid “goes down the wrong way” is to stand up). The exact degree to which the head of the bed should be elevated is determined by the protocol of your workplace but 30°-45° is typically recommended.

**Oral care**: Aspiration pneumonia is caused by entry of oral, nasal, and gastric secretions into the lungs. Rigorous attention to oral care and
(possibly) the use of antiseptic mouth rinses that contain chlorhexidine are often used as ways to reduce the number of microorganisms in the oral cavity and prevent aspiration pneumonia. Chlorhexidine is an antibacterial agent and a 0.12%-0.2% solution can be applied to a sponge and the patient’s mouth is swabbed four times a day; the frequency of its use and the protocol may vary from hospital to hospital.

**Assessment of nasogastric tube placement:** Nasogastric tubes can easily become misplaced, putting the patient at risk for aspiration. Frequent assessment of the proper position of nasogastric tube placement would not typically be a responsibility of CNAs but this is a recommended preventative technique.

**Tube feeding technique:** If a patient is receiving tube feedings and she/he is at risk for aspiration, tube feedings should be given at the prescribed rate. Do not increase the rate unless there is a specific order to do and never administer a tube feeding as a bolus; this increases the risk for aspiration.

**Measuring residual gastric volume:** A technique that has traditionally been used to prevent aspiration in patients who are receiving nasogastric feedings is measuring residual gastric volume. After a tube feeding, the amount of enteral nutrition liquid that is still in the stomach is measured. If the residual is above a certain amount
then it is assumed that the patient’s gastrointestinal tract is not properly absorbing the liquid nutrition and the excess volume puts him/her at risk for aspirating. This technique may be helpful for certain patients but recent research has questioned its usefulness.

**Avoid sedating drugs:** The use of sedating drugs increases the risk of aspiration. Administering these medications is not a CNA responsibility. However, you should be assessing patients for excessive drowsiness caused by sedatives, analgesics, and other drugs that can cause central nervous system depression and reporting these adverse effects if they occur.

**A CASE OF ASPIRATION PNEUMONIA**

Mrs. B is an 86-year-old female who has just been discharged from a hospital and admitted to a long-term care facility. She recently suffered a stroke that left her with significant weakness of her left arm and leg. She is unable to walk but with some assistance she can perform some simple activities of daily living and her mental status and speech are completely intact.

The patient has been depressed and occasionally mildly agitated as she tries to adjust to her limitations. In addition her appetite has been poor and for the past two days she has refused to eat, telling the staff that food “makes her sick.” She also complains of persistent pain in her left side.
Because of these developments the physician ordered the patient to be given a low dose of fluoxetine, a commonly used anti-depressant. The physician also requested an orthopedic and physical therapy consult and while awaiting the results of those evaluations, she prescribed a non-narcotic analgesic, tramadol. Finally, after extensive discussions with the patient and with her acceptance a small nasogastric tube was inserted and enteral tube feedings were begun. It was understood that the feeding tube would be in place for only a short period of time. Several days after the fluoxetine, tramadol, and tube feedings were started the patient’s condition was improved. Her mood was brighter, her pain was decreased, and she seemed to have more energy. Her pain was diagnosed as osteoarthritis, she was able to start physical therapy, and plans were made for her to move (within a few weeks) to a relative’s house, albeit with the support of visiting nurses. However, after a week of clinical gains the staff began to notice some mild regressions. The patient was sleeping more and had less energy during the day, although there were periods of time in which she seemed normal. She also had a fever of 100.1° F, but this only occurred once and the fever responded to fluids and a dose of acetaminophen. On the seventh day of her tube feedings Mrs. B was noted to have a fever of 102.7° F and her respiratory rate was 24. Shortly after being
assisted from her bed to a chair Mrs. B had several forceful, productive coughs and the CNA saw undigested tube feeding residue in the patient’s sputum. The physician was notified, a chest x-ray was done, and it was clear that Mrs. B had aspirated and had pneumonia.

**Case Summary**

This patient had obvious risk factors for an aspiration. She had recently had a stroke, she was prescribed several medications that are known to cause central nervous system depression, a nasogastric tube was in place, and she was receiving enteral tube feedings. The clinical course she experienced was fairly typical, with some subtle signs of silent aspiration being present before it became clear that some of the tube feeding and gastric juices had entered her lungs.

**SUMMARY**

Aspiration is defined as the movement of a foreign substance into the lungs, and aspiration can cause significant complications.

Aspiration occurs when the gag reflex and the cough reflex fail to prevent a foreign substance from entering the lungs. These episodes can be sudden and dramatic, but they can also be very minor and the patient may remain asymptomatic, the so-called silent aspiration.

There are many causes of aspiration. Some of the common ones are listed below. Although these are all distinct, separate problems they share two common characteristics: the patient is likely to have a
Depressed level of consciousness and the protective mechanisms that prevent aspiration are absent or compromised. Dysphagia in particular is very common and a significant cause of aspiration.

- Cerebral vascular accident (Stroke)
- Drug or alcohol overdose
- Dysphagia
- Excessive production of oral secretions
- General anesthesia
- Grand mal seizure
- Mechanical ventilation
- Nasogastric feedings
- Neurologic diseases
- Prolonged vomiting
- Sedative, hypnotic, or opioid medications
- Tracheostomy
- Traumatic brain injury

Aspirations can cause serious problems if: there is a large volume that is aspirated; the aspirate contains a large number of infectious bacteria; the aspirations are happening very frequently; the patient has a medical issue that complicates the situation or makes her/him susceptible to pulmonary problems. Examples of this would be patients who have a decreased level of consciousness, patients who have a compromised immune system, or patients who have a respiratory illness such as pneumonia or chronic obstructive pulmonary disease (COPD) that decreases the oxygen content of the blood. The most common complication of aspiration is aspiration pneumonia, and aspiration pneumonia is very common in elderly hospitalized patients. The signs and symptoms of aspiration can vary, but some of the
typical ones are:

- Change in consciousness, especially depressed consciousness
- Decreased oxygen saturation as measured by pulse oximetry
- Excessive drooling
- Fatigue
- Fever
- Increased sputum production
- Persistent, mild cough
- Rapid breathing
- Tachycardia
- Vomiting soon after meals

Screening for aspiration is a vital part of care. Evaluation to assess the risk for aspiration should be done on admission and repeated as necessary. Healthcare facilities have their own screening protocols, but the questions listed here are useful for performing a basic aspiration risk assessment.

- Is the patient elderly?
- Is she/he receiving any medications that can cause sedation?
- Does the patient have a neurological disease or disorder?
- Does the patient have excess secretions?
- Was general anesthesia recently used?
- Does the patient have obvious difficulty eating/swallowing?
- Is he/she unable to sit upright?
- Has the patient has a prior aspiration?
- Does she/he have a history of dysphagia?
- Does the patient have a depressed level of consciousness?

Specific measures for preventing aspiration include: 1) patient positioning; 2) oral care; 3) assessment of nasogastric tube placement; 4) tube feeding technique; 5) measuring residual gastric volume, and; 6) avoiding possible the use of sedating drugs.
Each health care facility will use its own preventive measures: follow the in-place protocols of your workplace and if you have doubts about what to do ask your supervisor.