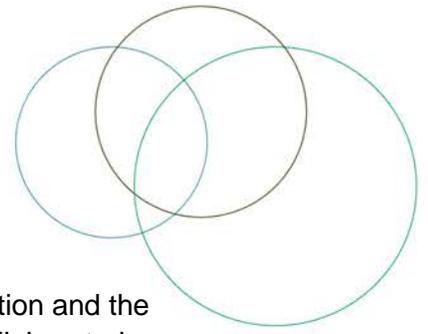


HOSPITAL HARM IMPROVEMENT RESOURCE

# Aspiration Pneumonia



## ACKNOWLEDGEMENTS



The Canadian Institute for Health Information and the Canadian Patient Safety Institute have collaborated on a body of work to address gaps in measuring harm and to support patient safety improvement efforts in Canadian hospitals.

The Hospital Harm Improvement Resource was developed by the Canadian Patient Safety Institute to complement the Hospital Harm measure developed by the Canadian Institute for Health Information. It links measurement and improvement by providing resources that will support patient safety improvement efforts.



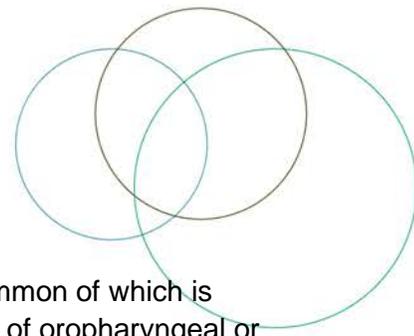


**DISCHARGE ABSTRACT DATABASE (DAD) CODES INCLUDED IN THIS CLINICAL CATEGORY:**

**A12: Aspiration Pneumonia**

<b>Concept</b>	Inflammation and infection of the lungs caused by aspiration of solids or liquids during a hospital stay.
<b>Selection criteria</b>	
<b>J69.–</b>	Identified as diagnosis type (2) <b>OR</b> Identified as diagnosis type (3) <b>AND</b> J95.88 as diagnosis type (2) <b>AND</b> Y60–Y84 <b>in the same diagnosis cluster</b>
<b>Exclusions</b>	Abstracts with a length of stay less than 2 days
<b>Codes</b>	<b>Code descriptions</b>
<b>J169.–</b>	Pneumonitis due to solids and liquids
<b>Additional codes</b>	<b>Inclusions</b>
<b>T95.88</b>	Other post procedural respiratory disorders <i>Includes:</i> Ventilator associated pneumonia (VAP)
<b>Y60-Y84</b>	Complications of medical and surgical care (refer to Appendix A of the <a href="#">Hospital Harm Indicator General Methodology Notes</a> )





## OVERVIEW

Nosocomial pneumonia can be classified into various subtypes, the most common of which is aspiration pneumonia (Marik, 2011). Aspiration is defined as the misdirection of oropharyngeal or gastric contents into the larynx and lower respiratory tract. Aspiration pneumonia then results when orogastric secretions colonized with bacteria produce an infectious response in the lungs. Aspiration of sterile contents causes chemical inflammation or aspiration pneumonitis (Marik, 2011).

There are three causes for aspirations that lead to aspiration pneumonia:

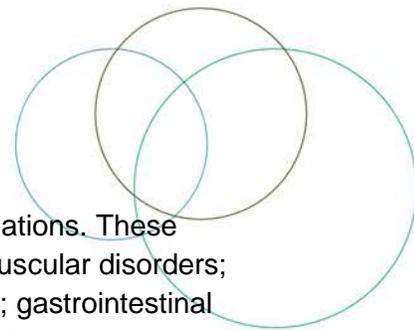
1. Orogastric secretions in patients with marked disturbance of consciousness. For example, acute neurological insult including stroke or head trauma.
2. Misdirected orally ingested liquids and/or foods due to swallowing difficulties secondary to a medical condition or intervention. For example, progressive neurological illnesses including Parkinson's disease, ALS as well as tumours of the head and neck or iatrogenic causes such as head and neck cancer treatments such as surgical ablation, chemoradiation therapy and damage to the laryngeal area following prolonged endotracheal intubation.
3. Misdirected orally ingested liquids and/or foods due to aging process.

Pneumonitis is best defined as acute lung injury following the aspiration of regurgitated gastric contents. This syndrome occurs in patients with a marked disturbance of consciousness, such as drug overdose, seizures, and anesthesia. Drug overdose is a common cause of aspiration pneumonitis, occurring in approximately 10 per cent of patients hospitalized following a drug overdose. The risk of aspiration increases with the degree of unconsciousness (as measured by the Glasgow Coma Scale). Historically, the syndrome most commonly associated with aspiration pneumonitis is Mendelson's syndrome (Marik, 2011).

Aspiration pneumonia occurs when regurgitated gastric contents or oropharyngeal secretions or food are inadvertently directed into the trachea and subsequently into the lungs. As the bacteria and other microorganisms become part of an infiltrate within the lung tissue, the resulting effect is an infection in the lung (Pace & McCullough, 2010). Approximately half of all healthy adults aspirate small amounts of oropharyngeal secretions during sleep. However, if the mechanical, humoral, or cellular mechanisms are impaired or if the aspirated inoculum is large enough, pneumonia may follow. Any condition that increases the volume and/or bacterial burden of oropharyngeal secretions when the host defense mechanism is impaired may lead to aspiration pneumonia (Marik, 2011). Healthy people commonly aspirate small amounts of oral secretions, but normal defense mechanisms usually clear the inoculum without sequelae. Aspiration of larger amounts, or aspiration in a patient with impaired pulmonary defenses, often causes pneumonia and/or abscess. Elderly patients tend to aspirate because of conditions associated with aging that alter the level of consciousness, sedative use, neurologic disorders, weakness and other disorders. Empyema also occasionally complicates aspiration (Sethi, 2014).



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Paediatric populations have different causes of dysphagia than in adult populations. These causes include: cerebral palsy; acquired/traumatic brain injury; other neuromuscular disorders; craniofacial malformations; airway malformations; congenital cardiac disease; gastrointestinal disease; ingestional injuries; and preterm birth (Dodrill & Gosa, 2015; Lefton-Greif & Arvedson, 2007).

Aspiration pneumonia represents five per cent to 15 per cent of pneumonias in the hospitalized population (DiBardino, 2015). It has been suggested that dysphagia carries a seven-fold increase risk of aspiration pneumonia and is an independent predictor of mortality (Metheny, 2011).

Critically ill patients have an increased risk for aspirating oropharyngeal secretions and regurgitated gastric contents. For those who are tube-fed, aspiration of gastric contents is of greater concern. While witnessed large-volume aspirations occur occasionally, small-volume clinically silent aspirations are far more common. Because no bedside tests are currently available to detect microaspirations, efforts to prevent or minimize aspiration take on added importance (American Association of Critical-Care Nurses, 2016). Silent aspiration is frequent in the pediatric population (Lefton-Grief et al, 2006).

Aspiration pneumonia generally occurs in elderly, debilitated patients with dysphagia (Marik, 2011). Epidemiological studies have demonstrated that the incidence of pneumonia increases with aging, with the risk being almost six times higher in those over the age of 75, compared to those less than 60 years of age (Marik, 2011).

Aspiration pneumonia is the major cause of death in patients with dysphagia resulting from neurological disorders including cerebrovascular accidents, Parkinson's disease, and dementia (Marik, 2011).

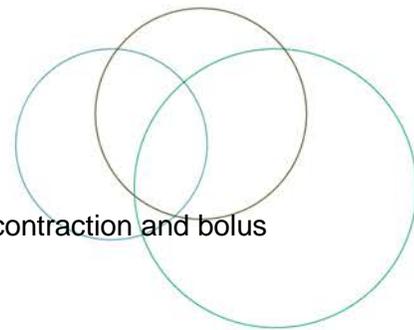
### Risk Factors for Aspiration Pneumonia and Pneumonitis

(DiBardino, 2015; Marik, 2011, American Association of Neuroscience Nurses, 2006)

1. Dysphagia/swallowing.
2. Altered mental status or decreased alertness and attention span.
3. Esophageal motility disorders/vomiting.
4. Enteral (tube) feeding.
5. Poor oral hygiene, decrease in salivary clearance.
6. Increased impulsiveness or agitation.
7. Use of medications such as psychotropic, neuroleptic, antidepressants, anticholinergic, or phenothiazine drugs.
8. Hyperextended neck or contractures.
9. Facial or neck reconstruction, cancers and their treatments.
10. Long-term intubation.



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11. Advancing age due to decreased muscle mass reducing pharyngeal contraction and bolus drive.
12. Supine position.

### Paediatric Risk Factors for Aspiration Pneumonia

(Weir et al, 2007)

1. Trisomy 21.
2. Asthma.
3. Gastroesophageal reflux disease (GERD).
4. Lower respiratory tract infection.
5. Moist cough.
6. Multisystem diagnoses.

**Note:** See also Hospital Harm Improvement Resource – [B16: Pneumonia](#)

## GOAL

To prevent aspiration pneumonia and aspiration pneumonitis in hospitalized patients by implementing strategies known to reduce the incidence of aspiration pneumonia and pneumonitis.

## IMPORTANCE FOR PATIENTS AND FAMILIES

Aspiration pneumonia and aspiration pneumonitis occurs when foreign material, such as food, drink, gastric secretions and secretions from the mouth are inhaled and cause inflammation in the lungs and bronchial tubes. Aspiration can often be prevented by dietary interventions for dysphagia e.g. adjusting texture, consistency and amount of food and fluids, frequent oral care, post-pyloric tube (tube passes through stomach and into small intestine) feedings, and the semi-recumbent (45 degree angle) position for mechanically ventilated patients (DiBardino, 2015).

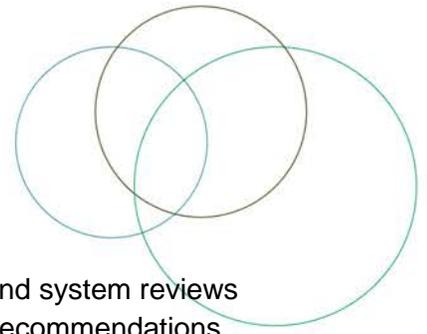
## Patient Story

### [Disabled woman died after NHS blunders, ombudsman finds | Disability | The Guardian](#)

A catalogue of mistakes by an out-of-hours GP service and a hospital contributed to the death of a young woman with physical and learning disabilities, the NHS ombudsman says in a highly critical report that has led to fresh claims of prejudicial attitudes leading to poor care for such vulnerable patients.

The report, by NHS ombudsman Dame Julie Mellor, finds that Tina Papalabropoulos, 23, died in Basildon hospital in Essex of aspiration pneumonia in 2009 after a series of blunders by two NHS organisations.





## CLINICAL AND SYSTEM REVIEWS, INCIDENT ANALYSES

Given the broad range of potential causes of aspiration pneumonia, clinical and system reviews should be conducted to identify potential causes and determine appropriate recommendations.

Occurrences of harm are often complex with many contributing factors. Organizations need to:

1. Measure and monitor the types and frequency of these occurrences.
2. Use appropriate analytical methods to understand the contributing factors.
3. Identify and implement solutions or interventions that are designed to prevent recurrence and reduce risk of harm.
4. Have mechanisms in place to mitigate consequences of harm when it occurs.

To develop a more in-depth understanding of the care delivered to patients, chart audits, incident analyses and prospective analyses can be helpful in identifying quality improvement opportunities. Links to key resources for [conducting chart audits](#) and [analysis methods](#) are included in the [Hospital Harm Improvement Resources Introduction](#)

If your review reveals that your cases of aspiration pneumonia are linked to specific processes or procedures, you may find these resources helpful:

- American Association of Critical-Care Nurses (AACN). AACN practice alert: Prevention of aspiration in adults. Critical Care Nurse (2016 - updated 2018). <https://www.aacn.org/clinical-resources/practice-alerts/prevention-of-aspiration>
- American Board of Swallowing and Swallowing Disorders. [www.swallowingdisorders.org](http://www.swallowingdisorders.org)
- Centers for Disease Control and Prevention and the Healthcare Infection Control Practices Advisory Committee - Guidelines for preventing health-care associated pneumonia. (2003) <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm>
- Dysphagia Research Society [www.dysphagiaresearch.org](http://www.dysphagiaresearch.org)
- NHS Patient Safety Resources. [www.nrls.npsa.nhs.uk/resources/?entryid45=59823](http://www.nrls.npsa.nhs.uk/resources/?entryid45=59823)

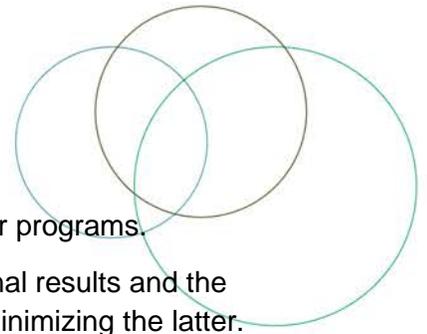
## MEASURES

Vital to quality improvement is measurement, and this applies specifically to implementation of interventions. The chosen measures will help to determine whether an impact is being made (primary outcome), whether the intervention is actually being carried out (process measures), and whether any unintended consequences ensue (balancing measures).

In selecting your measures, consider the following:



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- Whenever possible, use measures you are already collecting for other programs.
- Evaluate your choice of measures in terms of the usefulness of the final results and the resources required to obtain them; try to maximize the former while minimizing the latter.
- Try to include both process and outcome measures in your measurement scheme.
- You may use different measures or modify the measures described below to make them more appropriate and/or useful to your particular setting. However, be aware that modifying measures may limit the comparability of your results to others.

Posting your measure results within your hospital is a great way to keep your teams motivated and aware of progress. Try to include measures that your team will find meaningful and exciting (IHI, 2012).

## GLOBAL PATIENT SAFETY ALERTS

[Global Patient Safety Alerts](#) (GPSA) provides access and the opportunity to learn from other organizations about specific patient safety incidents including alerts, advisories, recommendations and solutions for improving care and preventing incidents.

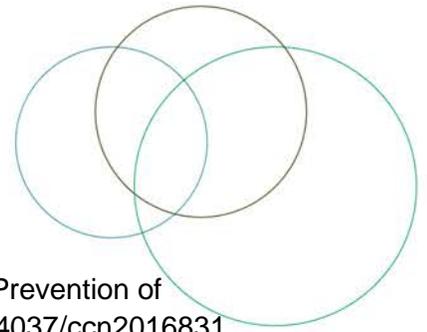
### Recommended search terms:

- Aspiration
- Aspiration Pneumonia
- Dysphagia
- Swallowing
- Ventilator-Associated Pneumonia (VAP)

## SUCCESS STORIES

If you have a success story, please share it with us. Contact [info@cpsi-icsp.ca](mailto:info@cpsi-icsp.ca)





## REFERENCES

- American Association of Critical-Care Nurses (AACN). AACN practice alert: Prevention of aspiration in adults. *Critical Care Nurse*. 2016; 36 (1): e20 – e24. doi: 10.4037/ccn2016831. <http://www.aacn.org/wd/practice/docs/practicealerts/aspiration-pa-feb2016ccn-pages.pdf>
- American Association of Neuroscience Nurses. Prevention: aspiration precautions. *Synapse*. 2006; 33 (3): 3.
- DiBardino DM, Wunderink RG. Aspiration pneumonia: A review of modern trends. *J Crit Care*. 2015; 30 (1): 40–48. doi: 10.1016/j.jcrc.2014.07.011.
- Dodrill P, Gosa MM. Pediatric dysphagia: physiology, assessment, and management. *Ann Nutr Metab*. 2015; 66 (Suppl 5): 24-31. doi: 10.1159/000381372. <http://www.karger.com/Article/FullText/381372>
- Institute for Healthcare Improvement (IHI). How-to Guide: Prevent Ventilator-Associated Pneumonia. Cambridge, MA: IHI; 2012. <http://www.ihl.org/resources/Pages/Tools/HowtoGuidePreventVAP.aspx>
- Lefton-Greif MA, Arvedson JC. Pediatric feeding and swallowing disorders: state of health, population trends, and application of the international classification of functioning, disability, and health. *Semin Speech Lang*. 2007; 28 (3): 161-165.
- Lefton-Greif MA, Carroll JL, Loughlin GM. Long-term follow-up of oropharyngeal dysphagia in children without apparent risk factors. *Pediatr Pulmonol*. 2006; 41 (11): 1040-1048.
- Marik *Curr Opin Pulm Med*. 2011, 17 (3):148–154. doi: 10.1097/MCP.0b013e32834397d6PE. Pulmonary aspiration syndromes.
- Metheny NA. Preventing aspiration in older adults with dysphagia. *Med-Surg Matters*. 2011; 20 (5): 6-7. <https://consultgeri.org/try-this/general-assessment/issue-20.pdf>
- Pace CC, McCullough GH. The association between oral microorganisms and aspiration pneumonia in the institutionalized elderly: review and recommendations. *Dysphagia*. 2010; 25 (4): 307-322. doi: 10.1007/s00455-010-9298-9. <http://link.springer.com/article/10.1007%2Fs00455-010-9298-9>
- Sethi S. Aspiration pneumonitis and pneumonia. *Merck Manual*. 2014. [http://www.merckmanuals.com/professional/pulmonary\\_disorders/pneumonia/aspiration\\_pneumonitis\\_and\\_pneumonia.html](http://www.merckmanuals.com/professional/pulmonary_disorders/pneumonia/aspiration_pneumonitis_and_pneumonia.html)
- Weir K, McMahon S, Barry L, Ware R, Masters IB, Chang AB. Oropharyngeal aspiration and pneumonia in children. *Pediatr Pulmonol*. 2007; 42: 1024-1031.

