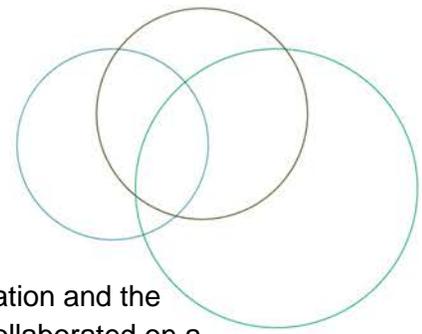


HOSPITAL HARM IMPROVEMENT RESOURCE

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.



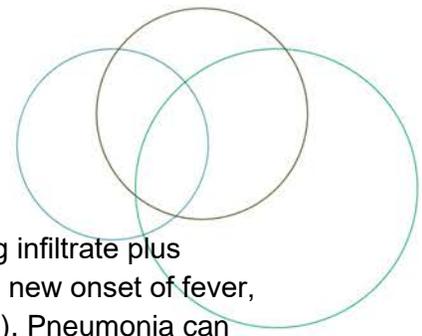


DISCHARGE ABSTRACT DATABASE (DAD) CODES INCLUDED IN THIS CLINICAL CATEGORY:

B16: Pneumonia

Concept	Pneumonia identified during a hospital stay.
Selection criteria	
J10.0 J11.0 J12.– J13 J14 J15.– J16.8 J18.– J85.1	Identified as diagnosis type (2) OR Identified as diagnosis type (3) AND J95.88 as diagnosis type (2) AND Y60–Y84 in the same diagnosis cluster
Exclusions	Abstracts with a length of stay less than 2 days
Codes	Code descriptions
J10.0	Influenza with pneumonia, other influenza virus identified
J11.0	Influenza with pneumonia, virus not identified
J12.–	Viral pneumonia, not elsewhere classified
J13	Pneumonia due to <i>Streptococcus pneumoniae</i>
J14	Pneumonia due to <i>Haemophilus influenzae</i>
J15.–	Bacterial pneumonia, not elsewhere classified
J16.8	Pneumonia due to other specified infectious organisms
J18.–	Pneumonia, organism unspecified
J85.1	Abscess of lung with pneumonia
Additional Codes	Inclusions
J95.88	Other post-procedural respiratory disorders <i>Includes:</i> Ventilator associated pneumonia (VAP)
Y60–Y84	Complications of medical and surgical care(refer to Appendix A of the Hospital Harm Indicator General Methodology Notes)





OVERVIEW AND IMPLICATIONS

Pneumonia is an infection of the lungs defined as the presence of “new lung infiltrate plus clinical evidence that the infiltrate is of an infectious origin, which include the new onset of fever, purulent sputum, leukocytosis, and decline in oxygenation” (Kalil et al., 2016). Pneumonia can be caused by viruses, bacteria, and fungi and can cause mild to severe illness in people of all ages and (Centers for Disease Control and Prevention (CDC), 2020).

For pneumonia to occur in any setting, at least one of the following three conditions must occur:

- significant impairment of host defenses,
- introduction of an inoculum of sufficient size into the lower respiratory tract to overwhelm the host’s defenses, or
- the presence of highly virulent organisms (Centre for Communicable Diseases and Infection Control, 2010).

Despite advances in the understanding of contributing causes and prevention, hospital acquired pneumonia (HAP) and ventilator associated pneumonia (VAP) continue to be frequent complications of hospital care. Together, they are among the most common hospital-acquired infections (HAIs), accounting for 22 per cent of all HAIs (Kalil et al., 2016).

Hospital-acquired pneumonia (HAP)

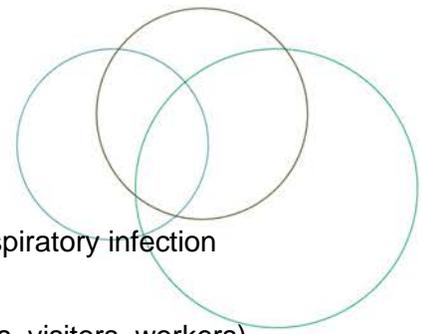
HAP is an acute lower respiratory tract infection that is, by definition, acquired after at least 48 hours of admission to the hospital and is not incubating at the time of admission. Among patients with hospital-acquired infections, HAP is the leading cause of death and causes 22% of all hospital-acquired infections. Though generally considered to be less severe than ventilator-associated pneumonia (VAP), even in HAP serious complications occur in approximately 50% of patients, including respiratory failure, pleural effusions, septic shock, renal failure, and empyema (Kalil et al., 2016).

Ventilator-associated pneumonia (VAP)

Ventilator-associated pneumonia (VAP) is defined by infection of the pulmonary parenchyma in patients exposed to invasive mechanical ventilation for at least 48 hours and is part of ICU-acquired pneumonia. VAP remains one of the most common infections in patients requiring invasive mechanical ventilation.

VAP is reported to affect five to 40 per cent of patients receiving invasive mechanical ventilation for more than two days (Papazian et al., 2020). Compared to similar patients without VAP, these infections negatively impact important patient outcomes and prolong both the length of mechanical ventilation and hospitalization (Kalil et al., 2016). Kalil et al. indicate that while all-cause mortality associated with VAP has been reported to range from 20 to 50 per cent, the mortality directly related to VAP is debated (2016).





Risk of Transmission

In all healthcare settings, there is significant risk of transmission of acute respiratory infection (ARI) to patients and to healthcare providers. This is due to:

- the large number of people (i.e., patients, family members, volunteers, visitors, workers) who come and go in these settings;
- the ease with which droplet-spread respiratory illnesses can pass from one person to another;
- the fact that many clients/patients/residents have other illnesses that make them more likely to experience complications from respiratory infections; and
- the large number of people who seek care for or develop ARI in these settings.

(Provincial Infectious Diseases Advisory Committee (PIDAC), 2013)

GOAL

To prevent hospital-acquired pneumonia in hospitalized adult patients by implementing proven interventions.

IMPORTANCE TO PATIENTS AND FAMILIES

Hospital-acquired pneumonia, and notably ventilator-associated pneumonia, developing as a consequence of lung bacterial colonization, alters clinically important outcomes, including duration of mechanical ventilation, length of stay in the intensive care unit (ICU), and mortality rates (Kalil et al., 2016; Roquilly et al., 2015).

VAP is one of the most serious complications for the most critically ill and vulnerable patients and can be avoided in the hospital by using proven strategies (Institute for Healthcare Improvement (IHI), 2012).

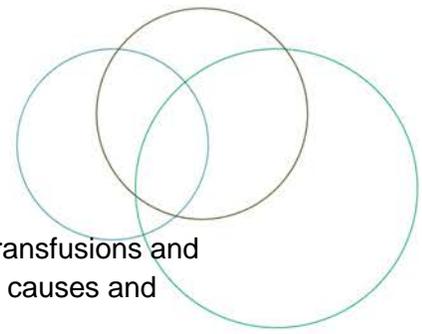
Vaccines can prevent some types of Pneumonia. Patients can help prevent pneumonia and other respiratory infections by following good hygiene practices. These practices include cleaning hands regularly and disinfecting frequently touched surfaces (CDC, 2020).

Patient Story

Claire inspires change after her passing

Claire, the nine year- old daughter of an ICU nurse, died after 16 days in the same intensive care, following surgery to repair a malformation in her skull. After surgery, Claire was placed in a deep sleep and on a ventilator. She eventually succumbed to complications, including pneumonia. Her mother risked everything to fight in Claire's memory. A review of Claire's care found that ventilator management was below accepted standards. It also revealed Claire's death was precipitated by an abrupt rise in carbon dioxide caused, most commonly, by a blocked endotracheal tube. The review deemed Claire's death as preventable (Canadian Patient Safety Institute, 2011).





CLINICAL AND SYSTEM REVIEWS, INCIDENT ANALYSES

Given the broad range of potential causes of complications from infusions, transfusions and injections, clinical and system reviews should be conducted to identify latent 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 pneumonia-related events are linked to specific processes or procedures, you may find these resources helpful:

- Association for Professionals in Infection Control and Epidemiology, Inc. (APIC). <https://apic.org/>
 - Pneumonia- <https://apic.org/resources/topic-specific-infection-prevention/pneumonia/>
 - FAQs about Ventilator-Associated Pneumonia (VAP)- https://apic.org/Resource_/TinyMceFileManager/Practice_Guidance/NNL_VAP.pdf
- Infectious Diseases Society of America <https://www.idsociety.org/> and The American Thoracic Society <https://www.thoracic.org/>
 - Management of Adults with Hospital-acquired and Ventilator-associated Pneumonia: 2016 Clinical Practice Guidelines Thoracic Society; Clinical Infectious Diseases, Volume 63, Issue 5, 1 September 2016, Pages e61–e111. <https://academic.oup.com/cid/article/63/5/e61/2237650>
- Public Health Agency of Canada. <https://www.canada.ca/en/public-health.html>
 - Infection Control Guideline for the Prevention of Healthcare-Associated Pneumonia http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-54-2010-eng.pdf
- Public Health Ontario. <https://www.publichealthontario.ca/>
 - Provincial Infectious Diseases Advisory Committee (PIDAC) Annex B: Best practices for prevention of transmission of acute respiratory infection in all health care settings. 2013. <https://www.publichealthontario.ca/-/media/documents/bp-prevention-transmission-ari.pdf?la=en>



HOSPITAL HARM IMPROVEMENT RESOURCE

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- The Society for Healthcare Epidemiology of America. <http://www.shea-online.org/>
 - Compendium of Strategies to Prevent Healthcare-Associated Infections in Acute Care Hospitals <http://www.shea-online.org/index.php/practice-resources/priority-topics/compendium-of-strategies-to-prevent-hais>
 - SHEA/IDSA Strategies to Prevent Ventilator-Associated Pneumonia in Acute Care Hospitals: 2014 Update https://www.jstor.org/stable/10.1086/677144#metadata_info_tab_contents

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:

- 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 (Institute for Healthcare Improvement (IHI), 2012).

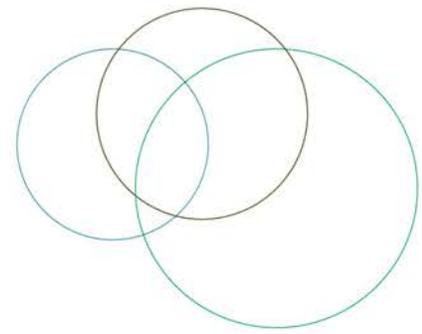
GLOBAL PATIENT SAFETY ALERTS

[Global Patient Safety Alerts](#) 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. Learning from the experience of other organizations can accelerate improvement.



HOSPITAL HARM IMPROVEMENT RESOURCE

Pneumonia



Recommended search terms:

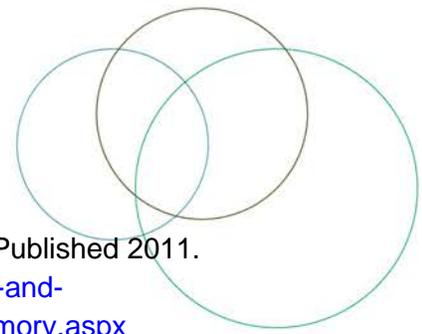
- Hospital acquired pneumonia (HAP)
- Pneumonia
- Ventilator-associated pneumonia (VAP)

SUCCESS STORY

Oral Hygiene for Pneumonia Prevention

Many care-dependent clients in acute surgical settings are at risk for hospital-acquired pneumonia. A concern about high HAP rates on the neurosurgical ward at Royal Columbian Hospital (RCH) was identified by the Clinical Nurse Specialist (CNS). A multidisciplinary team was formed, led by the CNS and a Speech Language Pathologist (SLP) (Health Standards Organization, 2015)





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