

Provincial Clinical Knowledge Topic Community Acquired Pneumonia, Adult – Inpatient V 1.0

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Revision History

Version	Date of Revision	Description of Revision	Revised By
1.0	June 26, 2018	Topic Completed	See Acknowledgments

Important Information Before You Begin

The recommendations contained in this knowledge topic have been provincially adjudicated and are based on best practice and available evidence. Clinicians applying these recommendations should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care. This knowledge topic will be reviewed periodically and updated as best practice evidence and practice change.

The information in this topic strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards and align with Quality and Safety initiatives and accreditation requirements such as the Required Organizational Practices. Some examples of these initiatives or groups are: Health Quality Council Alberta (HQCA), Choosing Wisely campaign, Safer Healthcare Now campaign etc.

Guidelines

This Clinical Knowledge Topic is based on the following guidelines/resources:

- Mandell L, Marrie T, Grossman R, Chow A, Hyland R, the Canadian CAP Working Group. Summary of Canadian Guidelines for the Initial Management of Community-Acquired Pneumonia: An Evidence-Based Update by the Canadian Infectious Diseases Society and the Canadian Thoracic Society. *Canadian Respiratory Journal*. 2000;7(5):371-382. doi:10.1155/2000/412616.
- Mandell L, Wunderink R, Anzueto A et al. Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults. *Clinical Infectious Diseases*. 2007;44(Supplement_2):S27-S72. doi:10.1086/511159.
- Lim W, Baudouin S, George R et al. BTS guidelines for the management of community acquired pneumonia in adults: update 2009. *Thorax*. 2009;64(Suppl 3):iii1-iii55. doi:10.1136/thx.2009.121434.
- Huchon G, Woodhead M, Gialdroni-Grassi G et al. Guidelines for management of adult community-acquired lower respiratory tract infections. *European Respiratory Journal*. 1998;11(4):986-991. doi:10.1183/09031936.98.11040986.
- National Institute for Health Care Excellence and guideline no. 191. 2018. Available at: <https://www.nice.org.uk/guidance/cg191/evidence/full-guideline-pdf-193389085>

Keywords

- Pneumonia
- CAP
- Community acquired pneumonia

Decision Making

Scoring and Assessment Tool

Curb-65: Site of Care Determination – To determine if admitted patient may require inpatient or inpatient with ICU consultation for management of community acquired pneumonia (CAP).

Table 1: CURB-65¹

	Characteristics	Score
C	Confusion	1
U	Urea GREATER than 7 mmol/L	1
R	Respiratory Rate GREATER than or equal to 30 breaths/min	1
BP	Systolic Blood Pressure (SBP) LESS than or equal to 90 mmHg OR Diastolic Blood Pressure (DBP) LESS than or equal to 60 mmHg	1
65 years	Age GREATER than 65 years	1

CURB-65 score	30-day Mortality Risk (%)	Management
0 to 1*	1.5%	Consider outpatient management
2	9.2%	Hospital admission suggested; consider discharge with close follow up in 2-3 days in certain circumstances
3 or GREATER	22%	Hospital admission with consideration of critical care consultation with scores of 4 or 5

* When CURB65 is 0-1, and the patient will be managed as an outpatient, blood and sputum cultures are usually not advised based on low yield and limited clinical utility. Chest x-ray is routinely recommended to make a diagnosis of CAP. A small minority of patients will present with clinical features consistent with pneumonia, but normal initial chest x-ray. Up to 55% of patients with initially normal chest x-ray will develop infiltrates on subsequent studies². In these patients, it is reasonable to treat with antibiotics, and repeat imaging in 24-48 hours.

Caveat:

No clinical probability tool can 100% predict the appropriate disposition for a patient. Other factors such as oxygen requirements, presence of systemic inflammatory response syndrome (SIRS), sepsis, shock, complicating features such as presence of pleural effusion, immunocompromised, severe lung disease, and co-morbid medical conditions should factor into a decision to admit.

Community Acquired Pneumonia, Adult - Inpatient Order Set

Order Set Keywords: CAP, Community Acquired Pneumonia, Pneumonia
Risk Assessment/Scoring Tools/Screening: [CURB-65](#)

Goals of Care Designation

Conversations leading to the ordering of a Goals of Care Designation (GCD), should take place as early as possible in a patient's course of care. The Goals of Care Designation is created, or the previous GCD is affirmed or changed resulting from this conversation with the patient or, where appropriate, the Alternate Decision-Maker.

Complete the Goals of Care Designation (GCD) Order Set within your electronic system, or if using paper process, complete the Provincial Goals of Care Designation (GCD) paper form (<http://www.albertahealthservices.ca/frm-103547.pdf>).

Admit, Discharge

- Admit To: _____, under the following service:
 - Family Medicine
 - General Internal Medicine
 - Pulmonology
 - Admitting attending physician: _____
- Anticipated Date of Discharge: _____

Patient Care

Activity

- Activity as Tolerated
- Other: _____

Monitoring

- Vital Signs: Respiratory Rate, Pulse, Blood Pressure, Temperature, Oxygen Saturations
 - Every 4 hours
 - Every 8 hours
 - Every 12 hours
 - Every _____ hour(s)

Point of Care Testing (POCT)

- Blood Glucose Monitoring – POCT every _____ hour(s)

Safety and Precautions - Refer to Infection Prevention and Control (IPC) Resource Manual for additional guidance

For suspected or known pertussis, viral respiratory tract infection or Influenza-like Illness

- Isolation – Contact and Droplet Precautions

For suspected or known methicillin resistant staphylococcus aureus (MRSA) and vancomycin-resistant Enterococci (VRE) colonized patients

- Isolation – Contact Precautions only

For suspected or known Mycobacterium tuberculosis complex infection or measles

- Isolation – Airborne Precautions

Diet

- NPO
- NPO – May take medications with sips of water
- Clear Fluids
- Regular Diet
- Other: _____

Respiratory Care

- O₂ Therapy – Titrate to maintain SpO₂ between 92-96%
- O₂ Therapy – Titrate to maintain SpO₂ between 88-92% for COPD patients

Laboratory Investigations - If not completed in emergency department

Hematology

- Complete Blood Count (CBC) with differential _____ (*indicate frequency*)

Chemistry

- Electrolytes (Na, K, Cl, CO₂) _____ (*indicate frequency*)
- Urea _____ (*indicate frequency*)
- Creatinine _____ (*indicate frequency*)
- ALT _____ (*indicate frequency*)
- GGT _____ (*indicate frequency*)
- Glucose Random _____ (*indicate frequency*)
- Alkaline Phosphatase (ALP) _____ (*indicate frequency*)
- Bilirubin Total _____ (*indicate frequency*)
- Calcium (Ca) _____ (*indicate frequency*)
- Albumin _____ (*indicate frequency*)
- Magnesium (Mg) _____ (*indicate frequency*)
- Phosphate _____ (*indicate frequency*)
- Lactate _____ (*indicate frequency*)

Repeating Labs

- _____ (*indicate lab test*) every _____ (*specify frequency*) for _____ days

Blood Gases

Consider if oxygen saturation is less than 92% on room air or patient is in respiratory distress

- Blood Gas Arterial

Microbiology

- Blood Culture
- Sputum Bacterial Culture – collect prior to antibiotic administration

For suspected Mycobacterium tuberculosis

- Sputum for Mycobacteria (AFB) Smear and Culture x 3

For patients presenting with Influenza-like Illness symptoms

- Nasopharyngeal Swab for Respiratory Virus Panel

Diagnostic Imaging

- Chest X-ray PA and Lateral (GR Chest, 2 Projections). Indication: To evaluate for infiltration and/or pleural effusion
- Chest X-ray Portable PA only (GR Chest, 1 Projection portable)

Intravenous Therapy

- Intravenous Cannula – Insert: Initiate IV
- IV Peripheral Saline Flush/Lock: flush with 2 to 5 mL 0.9% NaCl every 8 hours for peripheral infusion lines

IV Bolus or IV Solutions for resuscitation

- IV Bolus: _____ infusion _____ mL over _____ hour(s)
- 0.9% NaCl infusion IV at _____ mL/hour
- lactated ringer's infusion IV at _____ mL/hour

Maintenance IV Solutions

- 0.45% NaCl infusion IV at _____ mL/hour
- D5W - 0.45% NaCl infusion IV at _____ mL/hour
- IV fluids (other): _____ infusion IV at _____ mL/hour

Medications

Suspected Viral Infection

Ensure Respiratory Viral Panel has been ordered above.

For confirmed or suspected influenza A or B, initiate empiric therapy with oseltamivir during influenza season. Oseltamivir is recommended as early as possible for hospitalized patients.

For other suspected viral respiratory tract infection, antibacterial or antiviral treatment are not advised. Discontinue oseltamivir if influenza A/B testing on nasopharyngeal swab is negative.

For dosage adjustment in renal impairment, refer to drug information resources or consult pharmacist.

Generally, oseltamivir is recommended for a total duration of 5 days. However, in the case of severely prolonged influenza and/or immunocompromised patients (immunosuppressive therapies, solid organ or bone marrow transplant patients, or those receiving chemotherapy for cancer) extension of duration may be considered along with expert consultation.

- oseltamivir 75 mg PO BID x 5 days – Ensure nasopharyngeal swab has been collected prior to initiation

Suspected Bacterial Infection – Inpatient Treatment (Non-ICU)

For bacterial infection not due to Pseudomonas aeruginosa or methicillin-resistant Staphylococcus aureus (MRSA). Choose options A or B below.

OPTION A:

For cefTRIAxone, recommended course minimum of 5 days and until afebrile for 48-72 hours

- cefTRIAxone 1 gram IV daily; reassess after _____ days

AND Choose ONE:

For doxycycline, recommended course minimum of 5 days and until afebrile for 48-72 hours

- doxycycline 200 mg PO once now **AND THEN** 100 mg PO BID; reassess after _____ days

- AZIthromycin 500 mg PO/IV daily for 3 days

For clarithromycin, recommended course minimum of 5 days and until afebrile for 48-72 hours

- clarithromycin long acting (XL) 1 gram PO daily; reassess after _____ days

OPTION B: Alternative option (levofloxacin alone):

- levofloxacin 750 mg PO/IV daily for 5 days

Suspected Pseudomonas aeruginosa (P. aeruginosa)

Risk factors for P. aeruginosa:

- *Bronchiectasis with previous isolation of P. aeruginosa or other compromising conditions (eg. neutropenia or transplant)*
- *Repeated acute exacerbation of COPD requiring frequent glucocorticoid and/or antibiotic use*

Previous cultures should be used as a guide for empiric therapy until new cultures are available.

Reassess antibiotic therapy based on culture results.

Choose BOTH:

- piperacillin / tazobactam 4.5 grams IV every 6 hours; reassess after _____ days

AND

- ciprofloxacin 750 mg PO BID; reassess after _____ days

Suspected or previous colonization of methicillin-resistant Staphylococcus aureus (MRSA) ADD to either of above regimes:

If there is an allergy or intolerance to IV vancomycin, than expert consultation is advised.

Recommended dose is 30 mg/kg; dose rounded to nearest 250 mg.

- vancomycin _____ mg IV loading dose once

AND THEN

Note: Dosing interval is determined by creatinine clearance and desired trough levels; see [AHS vancomycin dosing](#) for details or consult clinical pharmacist for vancomycin monitoring. Clinical pharmacist may not be available at all sites. Utilize the most appropriate/available health care provider(s) at your site to deliver services.

Recommended dose is 15 mg/kg; dose rounded to nearest 250 mg; maximum 2 grams/dose.

- vancomycin _____ mg IV every _____ hours

DVT Prophylaxis

- Please see VTE Prophylaxis Adult Patient Care Order Set on the AHS internal website

Vaccination Prior to Discharge - *If indicated, when the patient is no longer febrile or acutely ill, with verbal or written informed consent*

During influenza vaccination season, if NOT already vaccinated

- influenza vaccine 0.5 mL IM once

Review vaccine history and eligibility criteria

- pneumococcal polysaccharide vaccine 0.5 mL IM once

Transitions and Referrals - *Utilize the most appropriate/available health care provider(s) at your site to deliver services*

- Pharmacy Referral – For vancomycin dosing and monitoring and/or if patient has renal or hepatic dysfunction for dose adjustments
- Speech Language – Assess and Treat, Swallow Assessment
- Physiotherapy – Assess and Treat
- Occupational Therapy – Assess and Treat
- Social Worker Referral

Consider Dietitian Referral for the following:

- *If Canadian Nutrition Screening Tool (CNST) score equals 2 Yes answers*
- *If patient assessed to be malnourished during admission (Subjective Global Assessment (SGA)-B or SGA-C)*
- *If patient has been NPO or on Clear Fluids for numbers of days*
- Dietitian Referral
- Other (specify): _____

Analytics

Analytics – Outcome Measure #1, Compliance to Clinical Standards

Name of Measure	Compliance to clinical standards of CKT ie. Scoring tools, specific items/orders in the order set
Definition	<p>The elements of the CKT for which it is important to measure compliance against ie. Scoring tools, specific items/orders in the order set are:</p> <ul style="list-style-type: none"> • Was chest x ray taken at the time of diagnosis? • Was CURB-65 utilized to determine need for/location of admission? • Was sputum bacterial culture collected prior to the administration of antibiotics? • When the Respiratory Virus Panel via nasopharyngeal (NP) swab is collected: <ul style="list-style-type: none"> ○ What percentage of time was oseltamivir prescribed? ○ Was oseltamivir discontinued if NP swab results were negative?
Rationale	Measure compliance to specified clinical standards within the CKT

Relevant Clinical Knowledge Topics

- Pneumonia, Adult – Emergency Department Clinical Knowledge Topic

References

1. Lim WS, van der Eerden MH, Laing R, et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003;58(5):377-382.
2. Hagaman J, Rouan GW, Shipley RT, et al. Admission chest radiograph lack sensitivity in the diagnosis of community acquired pneumonia. *Am J Med Sci*. 2009;337:236-240.

Additional References

- Mandell L, Marrie T, Grossman R, Chow A, Hyland R, the Canadian CAP Working Group. Summary of Canadian Guidelines for the Initial Management of Community-Acquired Pneumonia: An Evidence-Based Update by the Canadian Infectious Diseases Society and the Canadian Thoracic Society. *Canadian Respiratory Journal*. 2000;7(5):371-382. doi:10.1155/2000/412616.
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Name	Title	Zone
<i>Knowledge Lead</i>		
Benjamin Sugars	Physician, Internal Medicine	Provincial
<i>Topic Lead</i>		
Kimberley Mulchey	Physician, Respiriology, Internal Medicine	Edmonton Zone
<i>Working Group Members</i>		
Jamil Kanji	Physician, Medical Microbiology, Internal Medicine, Infectious Diseases	Edmonton Zone
Elizabeth Mackay	Physician, Internal Medicine	Calgary Zone
Connie Kadey	Respiratory Therapist	Central Zone
Kathy Unger	Physician, Family Medicine	Central Zone
Bao Dang	Physician, Respiriology, Internal Medicine	South Zone
Catherine Johansen	Respiratory Therapist	South Zone
Magali Benard	Physician, Family Medicine	North Zone
<i>Clinical Support Services</i>		
Jennifer Shiu	Pharmacy Information Management Governance Committee (PIM-GC) <i>on behalf of</i> Pharmacy Services	Provincial
James Wesenberg	<i>on behalf of</i> Laboratory Services - Provincial Networks	Provincial
Bernice Lau	<i>on behalf of</i> Diagnostic Imaging Services	Provincial
Carlota Basualdo-Hammond & Marlis Atkins	<i>on behalf of</i> Nutrition & Food Services	Provincial
<i>SCN or Provincial Committee</i>		
Respiratory Health Strategic Clinical Network		Provincial
<i>Clinical Informatics Lead</i>		
Leng My	Registered Nurse	Provincial

Additional Contributors

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For questions or feedback please contact ClinicalKnowledgeTopics@ahs.ca