Respiratory Infections in the Nursing Home

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Outline
1. General Principles of geriatric medicine relevant to respiratory infection
2. Key Respiratory Infections to Know and Understand
   – Presentation and Treatment
   – Common Questions and Controversies
3. What’s Left to Say About COVID-19?

A Nursing Home is Like a Cruise Ship
- High population density
- Lots of contact with others and the environment
- Many are old and high risk

Implications
- Infection control very important
- Resistant organisms can spread quickly
How Common Viruses Spread

<table>
<thead>
<tr>
<th>Infection</th>
<th>How It Spreads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>Airway → Air → Airway</td>
</tr>
<tr>
<td>Cold Viruses</td>
<td>Face → Hand → Surface → Hand → Face</td>
</tr>
<tr>
<td>Norovirus</td>
<td>Butt → Hand → Surface → Hand → Face</td>
</tr>
<tr>
<td>COVID-19</td>
<td>Airway → Air → Airway</td>
</tr>
</tbody>
</table>

Why We Wear Masks to Combat Airborne Viruses


Normal Temperature is Less Than 98.6, and Fever is Less Than 100.4°
Concern About Antibiotic Overuse

Between 25-75% of antibiotic prescriptions in long term care do not meet evidence-based clinical guidelines

Prescribing antibiotics “just in case” was accepted in the past, but now antibiotics should be given after careful, evidence-based consideration of risks and necessity.

X-Rays Are Often Unhelpful

- Quality is poor (patients move, often don’t take deep breath)
- One view instead of two
- NH residents often have scarring from old infections
- Because of this, radiologists in about 1/3 of cases will provide a vague report (e.g., “cannot rule out infiltrate”)

Aspiration Happens Frequently

- Up to 68% of NH residents aspirate
- Sign: cough after swallowing
- Usually clears without developing pneumonia
  But...
- Aspiration pneumonia is common in NH
Can Aspiration Prevented?

- Thickened liquids do not reduce aspiration or pneumonia
- Posture adjustment (e.g. chin tuck) – limited benefit
- Diet modification leads to poor intake and greater use of supplements

Bottom line: Individualize, but do not torture patient with measures that may not work

Bad Teeth Linked to Pneumonia

- Poor oral health → bacterial pathogens
- Bacteria get inhaled → aspiration pneumonia

Mouth Care Without a Battle ©
Individualized Mouth Care
for Persons with Cognitive and Physical Impairment

* Module 1: Basic Techniques
* Module 2: Managing Behavioral Challenges
* Module 3: Nurse Supervisor Training
* Module 4: Short Overview for Administrators / Advocates

* Continuing education credit available

More information: mouthcarewithoutabattle.org
**Cough Scares Providers, Leading to Overtreatment**

Research Result: Cough Alone Increases 3x the likelihood of a LTC Patient Getting Antibiotics

**Cough Occurs in All Respiratory Infections**

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>Common Cause</th>
<th>Common Symptoms</th>
<th>Distinguishing Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Cold</td>
<td>Virus</td>
<td>Nasal congestion/sneezing</td>
<td>Nasal symptoms Normal vitals (+/- fever) Unchanged lung exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sore throat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry cough (+/- fever)</td>
<td></td>
</tr>
<tr>
<td>Acute bronchitis</td>
<td>Virus</td>
<td>Cough (+/- sputum)</td>
<td>Normal chest X-ray Normal vitals (+/- fever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(+/- fever)</td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>Bacteria or Virus</td>
<td>Cough (+ sputum)</td>
<td>Abnormal vital signs Abnormal lung exam Infiltrate on chest X-ray</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pleuritic chest pain</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fever</td>
<td></td>
</tr>
<tr>
<td>Influenza-like illness</td>
<td>Virus</td>
<td>Sore throat</td>
<td>Chills Body aches Malaise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry cough</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fever</td>
<td></td>
</tr>
<tr>
<td>COPD exacerbation</td>
<td>Virus or bacterial</td>
<td>Cough (+/- sputum)</td>
<td>Normal chest X-ray Normal vitals (+/- fever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(+/- fever)</td>
<td></td>
</tr>
</tbody>
</table>

**Not-So- Novel Coronavirus (COVID-19)**

- Clinical picture from no symptoms to pneumonia
- 40% of deaths come from nursing home
- Drop in pulse ox usually precedes decompensation
How COVID-19 Compares

<table>
<thead>
<tr>
<th>Contagiousness $(R_0)$</th>
<th>Common Cold</th>
<th>Influenza</th>
<th>COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.0</td>
<td>1.3</td>
<td>Between 2 &amp; 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deadliness (Mortality)</th>
<th>Common Cold</th>
<th>Influenza</th>
<th>COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
<td>0.05%</td>
<td>Around 0.5%</td>
</tr>
</tbody>
</table>

Much higher mortality for aged 80+
COVID-19 Resources from NC DHHS

COVID-19 Resources from JAMDA
https://www.jamda.com/covid-19-articles

Flu Season is Just Around the Corner
Confirmed Influenza Cases, UNC Hospital Laboratories, 2015-2020
**What “Looks Like the Flu”?**

- Starts suddenly
- Fever and chills
- Dry cough
- Mild or moderate sore throat
- Fatigue and muscle aches
- Probability increases in “flu season”

*RED = best to distinguish flu from other respiratory viruses.*

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**When and Whom to Test for Flu**

“Influenza testing should occur when any resident has signs and symptoms of influenza-like illness.”

CDC defines influenza-like condition as an unexplained illness characterized by:

- Fever > 100°F, 37.8°C
  PLUS
- cough and/or sore throat

For details on lab testing, check CDC website


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**Flu Shot Effectiveness Is Mediocre - But It’s the Best We Have -**

*Percent Effectiveness of Flu Vaccines over the Past 15 Years*

Key Components of an Effective Nursing Home Influenza Program

<table>
<thead>
<tr>
<th>Component</th>
<th>Main Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccination</td>
<td>• Offer vaccine to all residents</td>
</tr>
<tr>
<td></td>
<td>• Require staff to be vaccinated</td>
</tr>
<tr>
<td>Surveillance and testing</td>
<td>• In influenza in community, watch for clinical signs suggesting influenza</td>
</tr>
<tr>
<td></td>
<td>• Test any person with suspicious symptoms</td>
</tr>
<tr>
<td>Infection prevention and control measures</td>
<td>• Place ill persons on droplet precautions</td>
</tr>
<tr>
<td></td>
<td>• Outbreak = 2 lab-confirmed cases in 72 hours</td>
</tr>
<tr>
<td></td>
<td>• If outbreak, institute control measures: visitor restrictions, test suspicious cases, notify health department, institute antiviral treatment and chemoprophylaxis</td>
</tr>
<tr>
<td>Antiviral treatment</td>
<td>• Treat all residents with confirmed or suspected influenza</td>
</tr>
<tr>
<td>Antiviral chemoprophylaxis</td>
<td>• If outbreak on a unit (2 cases), offer antiviral prophylaxis to all non-ill residents on that unit</td>
</tr>
<tr>
<td></td>
<td>• Consider prophylaxis for unit staff</td>
</tr>
</tbody>
</table>

Reference: http://www.cdc.gov/flu/professionals/infectioncontrol/ltc‐facility‐guidance.htm

There Are Other Viruses than Flu and COVID-19

Cases
Case 1: Mr. Jackson

- 82 year old, never smoked
- 4 days of illness
- Prominent symptoms are runny nose and sneezing.
- Had sore throat on first two days, now gone.
- Mild, dry cough
- No dyspnea
- Energy level normal

More about Mr. Jackson

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>98.4°F</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>145/85</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>18</td>
</tr>
<tr>
<td>Pulse</td>
<td>75</td>
</tr>
<tr>
<td>Pulse ox</td>
<td>97%</td>
</tr>
<tr>
<td>Mental status</td>
<td>Baseline</td>
</tr>
<tr>
<td>Lung exam</td>
<td>Clear</td>
</tr>
</tbody>
</table>

1. What is the most likely diagnosis?
2. What treatment(s) are indicated?

What to do for Mr. Jackson’s viral respiratory infection?

- Obtain COVID test
- Respiratory isolation until COVID test is back
- Reassure patient and/or family
- Monitor vital signs and worsening signs or symptoms
- Encourage fluids and rest
- Acetaminophen or NSAIDS for fever/pain
- Nasal saline spray/humidified air for congestion
- Consider cough medicine
“Sinus” and “Sinusitis”

• When people say they have “sinus” they don’t usually mean acute sinusitis.

• Acute sinusitis requires: purulent nasal drainage plus nasal obstruction and/or facial pain, pressure, or fullness, and (usually) fever.
  – Most is viral, a minority are bacterial
  – Proven effective: nasal steroids
  – Unproven effectiveness: antibiotics [but still they are overused]

Case 2: Mr. Leonard

• 76 year old non-smoker
• 5 days of illness
• Began with nasal congestion, sore throat
• Soon cough became main symptom, worse at night
• Small amount of sputum
• Decreased appetite, more tired but up and about

More about Mr. Leonard

<table>
<thead>
<tr>
<th>Temperature:</th>
<th>99.4°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure:</td>
<td>130/75</td>
</tr>
<tr>
<td>Respiratory rate:</td>
<td>18</td>
</tr>
<tr>
<td>Pulse:</td>
<td>75</td>
</tr>
<tr>
<td>Pulse ox:</td>
<td>97%</td>
</tr>
<tr>
<td>Mental status:</td>
<td>Baseline</td>
</tr>
<tr>
<td>Lung exam:</td>
<td>Scattered wheezes</td>
</tr>
</tbody>
</table>

1. What is the most likely diagnosis?
2. What treatment(s) are indicated?
**What is Mr. Leonard’s Diagnosis?**

- Upper Respiratory Infection
  - Nasal congestion
  - Sore throat
  - Sneezing

- Acute Bronchitis
  - Cough
  - Low grade fever
  - Normal other vital signs/non-focal lung exam (often with expiratory wheezes)

Could this be COVID-19?

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**What can be done for acute bronchitis?**

**TO DO:**
- Obtain COVID test
- Respiratory isolation until COVID test is back
- Reassure patient and/or family
- Monitor vital signs and worsening signs or symptoms
- Encourage fluids and rest
- Acetaminophen or NSAIDS for fever/pain
- Nasal saline spray/humidified air for congestion
- Cough medicine or inhaled bronchodilator

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**What About Antibiotics?**

- Most cases of bronchitis are VIRAL and won’t improve with antibiotic treatment.
- 65% of acute bronchitis cases in nursing homes did not follow evidence-based antibiotic treatment guidelines
- 2d most common reason for inappropriate antibiotic use in NHs

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“...But the Family Expects an Antibiotic”

*Studies show:*
- Patient/family expectations for antibiotics are overestimated
- Satisfaction is *not* severely impacted when antibiotics not given
- Communication and education are key

Nursing staff have the opportunity to educate and reassure

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How To Talk To Patients And Families About Viral Respiratory Illness

- **Inform** that resident is ill and staff is helping them – by providing symptom relief and monitoring
- **Advise** on illness course
  - Colds: up to 1.5 weeks
  - Bronchitis: up to 3 weeks
- **Respond** to concerns
- **Reassure** that antibiotics not needed
  - explain risks
  - explain that you will monitor

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What Could You Tell Mr. Leonard’s Concerned Family?

Advise on illness course:

"His cough might last several more days to several weeks, and it may take him a while to feel better."

Respond to concerns about symptoms:

"We’re going to help him feel more comfortable so his body can fight this virus. He’ll need plenty of fluids and rest. Also, we’ll give medicine for his fever and cough, and keep an eye on him."
If the Family Asks Specifically About Antibiotics

“Mr. Leonard’s chest cold is caused by a virus, and antibiotics won’t help viruses. Giving him antibiotics when they aren’t needed can cause side effects and make it so that antibiotics won’t work when he really needs them. We will monitor him closely for any change in condition that might indicate a need for antibiotics.”

Case 3: Mrs. Gallagher

- 78-year-old, smoker, COPD, on oxygen (2 L/min)
- 5 days of productive cough
- Increased dyspnea
- Pulse ox 93% (normal 93-95%)
- Temperature 100.0 °F
- Exam: rhinorrhea, nasal congestion, anterior wheezes.
- X-ray: no acute changes

1. What is the most likely diagnosis?
2. What treatment(s) are indicated?

Are Antibiotics Indicated for COPD Exacerbations?

- Cochrane systematic review:
  - large beneficial effects patients admitted to an ICU
  - For outpatients and inpatients, results inconsistent
- Guidelines for COPD exacerbation:
  - Mild disease: start with inhaled bronchodilator, consider oral steroids. If inadequate relief, consider antibiotic
  - Moderate / severe disease → inhaled bronchodilator, oral steroids, and antibiotics
  - Monitor for signs of pneumonia
What Clinical Signs Suggest Pneumonia?

- Abnormal vital signs
  - Fever
  - Respiratory rate > 25 (90% sensitive, 90% specific)
  - Tachycardia
- Pulse ox drop of >3% (about 75% sensitive and 75% specific)
- New localized rales on physical exam
- Acute delirium

Three Main Types of Pneumonia

- **Aspiration pneumonia**
  - Most common type of pneumonia in NH patients
  - Affects 300,000 – 600,000 Americans annually
  - Oral bacteria predominate
Three Main Types of Pneumonia

- **Aspiration pneumonia**
  - Most common type of pneumonia in NH patients
  - Affects 300,000 – 600,000 Americans annually
  - Oral bacteria predominate
- **Other bacterial pneumonia**
  - Often spontaneous, can follow viral infection
  - Variety of organisms

**Viral pneumonia**
- Common Causes: Flu and COVID-19
- Develops more slowly

Aspiration Pneumonitis vs Pneumonia

- Controversial area
  - When to diagnose?
  - When to treat?
  - How to prevent?
  - How best to treat?
- Pneumonitis – inflammation without infection
- Pneumonia – infection by a microorganism
Monitoring For Signs And Symptoms of Pneumonia

- Fever (especially if >100.4 °F)
- Respiratory rate ≥25 breaths/minute
- Elevated pulse (>100 beats per minute)
- Oxygen saturation <94% on room air or >3% reduction baseline
- New or worsening shortness of breath
- Lung exam with focal changes

If pneumonia is suspected, contact the provider.

Should We Prescribe Antibiotics for Pneumonia at the End of Life?

- Sir William Osler – pneumonia as the “old man’s friend”
- Terminal bronchopneumonia occurs in most dying patients
- Relieving dyspnea is crucial to quality of dying
- Most effective treatments include positioning, oxygen/humidification, sedatives / opioids
- Antibiotics are NOT effective treatment for dyspnea; can cause nausea and diarrhea
- Consider alternatives when comfort is main goal of care

To Sum it Up

“In some ways we feel we are as confused as ever, but we believe we are confused on a higher level and about more important things.”

Earl C. Kelley, Professor of Secondary Education, Wayne State University.