Respiratory Infections in Post-Acute and Long-Term Care

Philip D. Sloane, MD, MPH

Professor of Family Medicine and Geriatrics
Co-Director, Program on Aging, Chronic Illness, and Long-Term Care,
Cecil G. Sheps Center for Health Services Research
University of North Carolina
Chapel Hill, North Carolina

April 15, 2025

Collaborative Studies of Long-Term Care
University of North Carolina at Chapel Hill

1

Topics to Be Covered

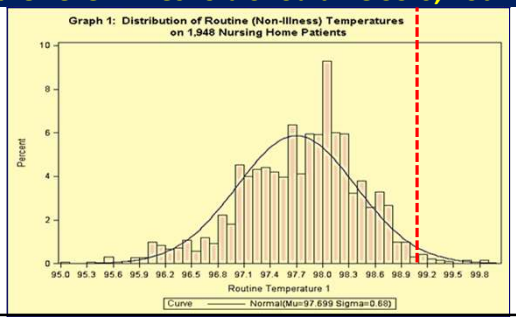
1. Principles of geriatric medicine relevant to respiratory infection
2. Respiratory bad-boy viruses
3. Other common respiratory infections in post-acute and long-term care settings

2

Principles of Geriatric Medicine that are Especially Relevant to Respiratory Infections

3

Average "Normal" Temperature is 97.7, not 98.6, and the Fever Threshold Should Be 99.0, not 100.4º



4

Antibiotic Stewardship is Important

- Nursing homes have a higher prevalence of multi-drug resistant organisms than hospitals
- Prescribing antibiotics "just in case" is no longer accepted practice
- Major targets for antibiotic stewardship:
  1. "Urine infection" this isn't an infection
  2. "Bronchitis" and "sinusitis" that isn't bacterial
  3. "Cellulitis" that isn't cellulitis
  4. Antibacterial treatment of viral respiratory infections (including COVID)

5

Mobile Chest-X-Ray Limitations

- Many residents can't sit up or stay stable
- Portable cameras don't take great pictures
- Lack of previous films for comparison

- Radiologists disagree frequently on
  - presence of infiltrate (K = 0.54)
  - pleural effusion (K = 0.8)
  - hilar lymphadenopathy (K = 0.54)
  - mediastinal lymphadenopathy (K =0.49)

Loeb MB, et al. JAMDA 2006; 7: 2006, 7:416–419
Drinka PJ, et al. J AMDA 2006:7:467-469

6

Aspiration Happens Frequently

- 2/3 of NH residents aspirate
- Sign: cough after swallowing
- Usually clears without developing pneumonia
  But….
- Aspiration pneumonia is common in NH

7

Thickened Liquids Can't Prevent Aspiration

- Evidence does not support belief that thickened liquids reduce aspiration or pneumonia
- Diet modification leads to poor intake and greater use of supplements
- Posture adjustment (e.g. chin tuck) – limited benefit

Bottom line: Individualize, but do not torture residents

8

Bad Teeth Are Linked to Pneumonia

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

9

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*

10

Cough Scares Nurses, Providers, and Families, Leading to Overtreatment

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

11

The Common Bad-Boy Viruses: COVID, FLU, and RSV

12

Different Viruses Spread Differently

Infection	How It Spreads	Key to Prevention
Influenza	Cough → Droplets	- Droplet precautions
Cold Viruses	Face → Hand → Surface; Sneeze → Droplets	- Hand washing, surgical mask
Norovirus	Butt → Hand → Surface	- Hand washing
COVID-19	Breath → Microdroplets	- Airborne precautions

13

The R_0 and Mortality Rate Determine Seriousness of an Infection

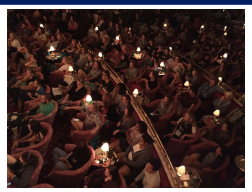
	Common Cold	Influenza	COVID-19 (2021, unvaccinated)
Contagiousness (R_0)	6.0	1.3	Between 2.5 & 8
Deadliness (Mortality)	0%	0.05%	Around 0.5% *

* Reduced 90% with vaccination and boosters

14

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

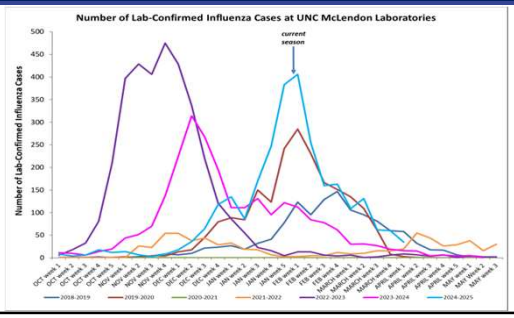


Implications

- Infection control very important
- Infections can spread quickly

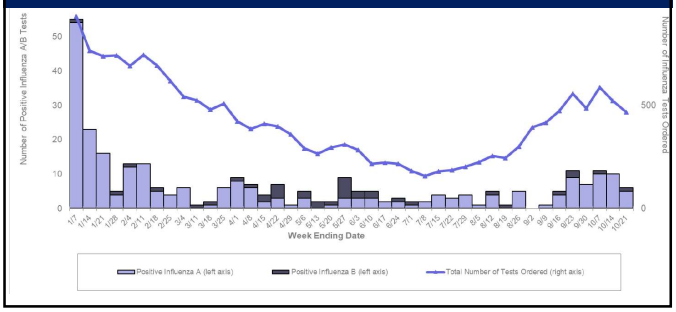
15

Incredible Fluctuation in Influenza Year-to-Year



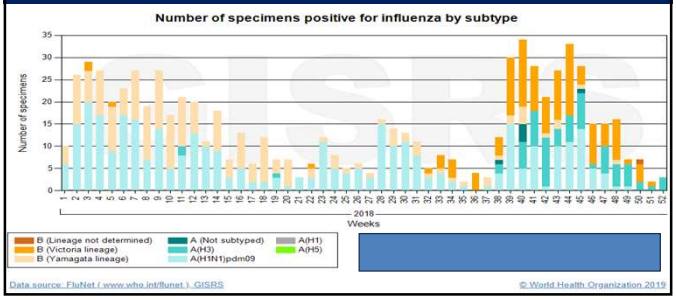
16

Influenza Testing at UNC in 2023



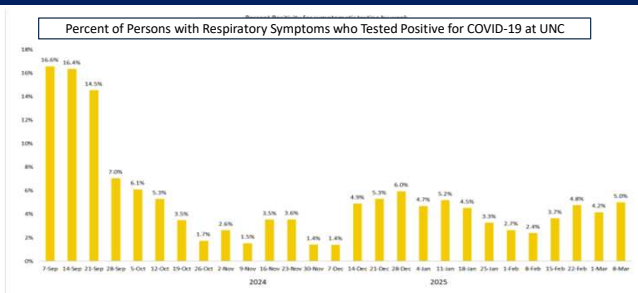
17

Influenza Curve in Ghana
(Flu as an Endemic Disease)



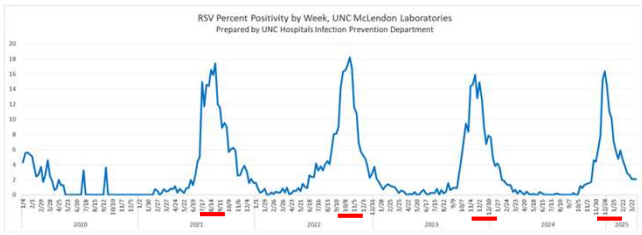
18

COVID is Now an Endemic Respiratory Virus



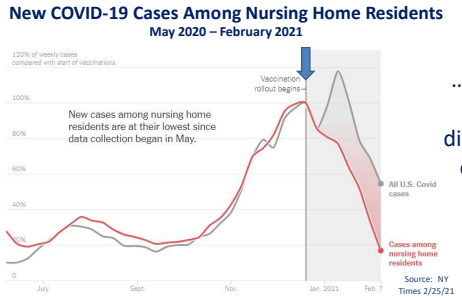
19

RSV Patterns Between 2020 and Now



20

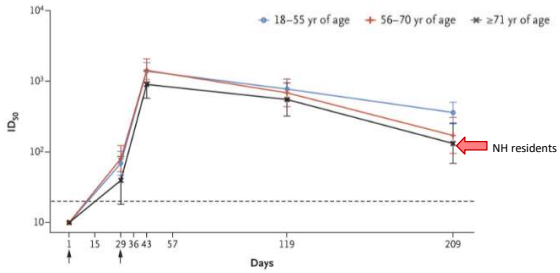
The Incredible Impact of Vaccination on COVID



…but then the subsequent disappointment of mutation.

21

Drop-Off in Antibody Levels after Immunization Is Steeper in Older Persons



22

Staff and Visitors Bring Respiratory Pathogens Into Your Facility

23

Influenza – Clinical Presentation

- 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.

24

Testing for Influenza

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

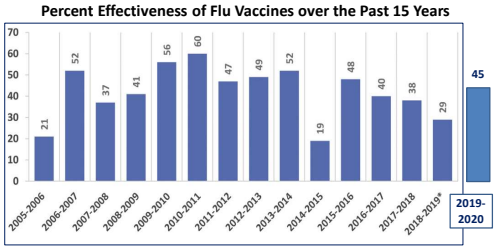
CDC defines influenza-like condition as an unexplained illness characterized by:

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

for details on lab testing, check CDC website
http://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm

25

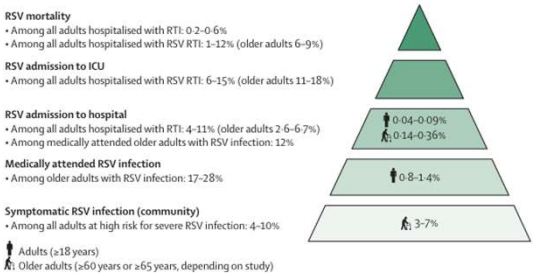
Flu Shot Effectiveness Is Mediocre
- But it Works because the R0 is low -



Reference: J Am Med Dir Assoc. 2020 Jan;21(1):25-28.e2.

26

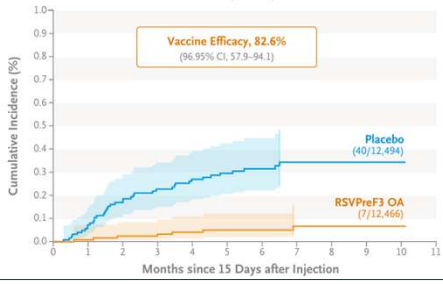
Epidemiology of RSV Infection in Older Adults



Source: Respiratory syncytial virus infections in adults: a narrative review. Lancet Respir Med. 2024 Oct;12(10):822-836.

27

How Good is RSV Vaccine in Older Adults?



Source: Respiratory Syncytial Virus Prefusion F Protein Vaccine in Older Adults. N Engl J Med. 2023 Feb 16;388(7):595-608.

28

Managing COVID-19 in the Nursing Home

- Diagnose, monitor and support all patients with COVID-19 illness
- Paxlovid for mild to moderate COVID-19 in high- risk patients
- Indications for hospitalization
  - ➢ Oxygen requirement increasing (typically beyond 6 L/min)
  - ➢ Testing needed that is not available in the NH

29

Lessons from COVID to Apply in the Future

- Infection control measures WILL keep viruses out of facilities
  - ✓Have all staff wear masks as soon as flu or COVID is in your community
  - ✓Screen visitors for symptoms and temperature
- Because rapid COVID testing has been helpful:
  - ✓ Have rapid COVID and Flu testing capacity on site; possibly for other viruses as well
- Because antibiotics continue to be overprescribed:
  - ✓ Work harder with medical staff to develop and use prescribing guidelines
- Because antivirals work:
  - ✓ Work harder with medical staff to develop and use prescribing guidelines
- Because of the negative impact of visitor restriction:
  - ✓ Try to avoid complete visitor lockdowns in the future

30

CDC Guidelines RE NH Residents with Acute Respiratory Illness Symptoms when COVID & Influenza Viruses are Co-circulating (pt 1)

- Place symptomatic residents on transmission-based precautions using PPE recommended for suspected COVID.
- Test any resident with symptoms of COVID-19 or influenza for both viruses.
- If resident is negative for both, consider additional viral (e.g., RSV) or bacterial testing.
- Place COVID or Flu positive residents in a private room. (Alternatives: room with other + resident, or room with special ventilation).
- Place residents who are COVID & Flu negative on standard precautions. Base additional precautions on suspected or confirmed diagnosis.

Testing and Management Considerations for Nursing Home Residents with Acute Respiratory Illness Symptoms when SARS-CoV-2 and Influenza Viruses are Co-circulating | CDC

31

CDC Guidelines RE NH Residents with Acute Respiratory Illness Symptoms when COVID & Influenza Viruses are Co-circulating (pt 2)

- If influenza test is positive or you strongly suspect influenza, treat with oseltamivir (Tamiflu).
- If diagnosis is COVID, treat using NIH guidelines.
- If diagnosis is bacterial pneumonia, use American Thoracic Society / Infectious Diseases Society of America guidelines.
- If influenza, treat exposed individuals with oseltamivir; if ≥2 influenza cases, expand prophylaxis to non-ill residents on unit(s) with cases.
- Encourage immunization: (a) for influenza and COVID of all residents and staff as updates available; (b) for RSV of residents 60+ (using shared decision-making); and (c) for pneumococcus of all unvaccinated residents 65+.

Testing and Management Considerations for Nursing Home Residents with Acute Respiratory Illness Symptoms when SARS-CoV-2 and Influenza Viruses are Co-circulating | CDC

32

Reporting Bad-Boy Infections to CDC

- In 2024 the Centers for Medicare & Medicaid Services issued a new rule requiring long-term care facilities to report resident information about COVID-19, influenza, and respiratory RSV starting January 1, 2025, on a weekly basis through the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network. This updated requirement replaced the previous COVID-only reporting requirement for staff and residents.

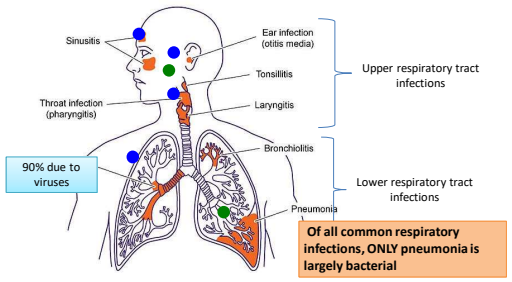
33

Other Common Respiratory Infections

34

Acute Respiratory Tract Infections

- Syndromes caused primarily by viruses
- Syndromes caused primarily by bacteria



35

Case #1

- 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

36

Vital Signs

Temperature:	99.4°F
Blood Pressure:	130/75
Respiratory rate:	18
Pulse:	75
Pulse ox:	97%
Mental status:	Baseline
Lung exam:	Scattered wheezes

What's the likely diagnosis?

Could this be COVID-19?

37

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)

What can and should we do for this patient?

38

There is Plenty You CAN Do for Acute Bronchitis

Order Set for Acute Bronchitis

- ☑ **Obtain COVID test**
- ☑ **Airborne 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

39

"…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

BMJ. 1998 Sep 5;317(7159):637-42.
Cochrane Database Syst Rev. 2013 Apr 30:4.
J Gen Intern Med. 2014 Nov 6

40

How To Talk To Patients And Families About Viral 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

BMJ. 2008;337:a437

41

What Could You Say to 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."

42

If the Family Asks Specifically About Antibiotics

"His 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."

43

Case #2

- 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

What's the likely diagnosis?

Are Antibiotics Indicated?

44

Which COPD Exacerbations Benefit from Antibiotics?

- 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

45

Pneumonia:
"The 'Old Man's Friend'?"

46

Pneumonia Signs and Symptoms in NH Residents

- 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
- WBC ≥ 14,000 or left shift

47

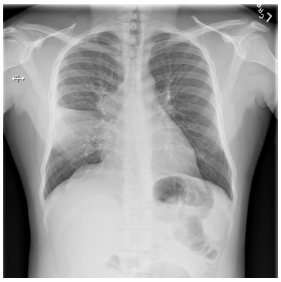
Three Main Types of Pneumonia: Aspiration

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

But….Aspiration-related choking is not pneumonia

48

Three Main Types of Pneumonia: Other Bacterial



- 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

49

Three Main Types of Pneumonia: Viral

- 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

50

When Antibiotics May Not Be Needed in Pneumonia

1. Chemical pneumonitis due to aspiration
   - ➢Symptoms and abnormal CXR usually resolve within 24 hours
   - ➢Antibiotics indicated if CXR changes fail to resolve in 48 hours
2. Viral pneumonia/bronchitis
3. Palliative care (e.g. end-stage dementia)
   - William Osler: Pneumonia as “old man’s friend”
   - Dyspnea is problem, treatment is oxygen, sedatives, opiates

51

To Sum it Up

Respiratory infection is more important than ever before in nursing home care.

Detection, diagnosis, and appropriate treatment require knowledge and the entire interdisciplinary team.

52