Influenza Outbreak Management in Long Term Care Facilities

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Outline

• Influenza basics
• Prevention
• Surveillance for cases
• Outbreak control measures
• Reporting
• References and resources

Influenza Virus

• Two types infect humans – A and B
• Influenza A
  – Two antigens involved in immune response
  – Hemagglutinin (H) – 17 known
  – Neuraminidase (N) – 10 known
• Named by H and N subtype
  – Further classified by serotype
  – H1N1 and H3N2 circulate in humans

Hemagglutinin Antigens
Neuraminidase Antigens
Epidemiology of Influenza

- Highly infectious
- Transmission
  - Primarily person to person via large and aerosolized small virus-laden droplets
  - Fomites/direct contact – less important
- Incubation period: 1-4 days
- Peak virus shedding from 1 day prior to onset of symptoms to 5 days after but may be longer in children

Typical Influenza illness

- Abrupt onset
  - Fever
  - Cough and/or sore throat
  - Headache
  - Myalgia
  - Fatigue
  - Gastrointestinal symptoms rare in adults; may occur in children

Continued...

- Acute illness usually lasts ≤1 week but cough and fatigue can persist
- Clinical severity ranges from asymptomatic illness to primary viral pneumonia and death
Influenza Illness in the Elderly

• Change in baseline rather than overt illness
• Increased secretions, temperature instability
• Low threshold to suspect influenza or other communicable disease

Serious influenza complications

• Viral and bacterial pneumonia
• Worsening of underlying chronic disease
• Otitis media, myocarditis, encephalopathy, toxic shock syndrome
• Death

Persons at increased risk for medical complications

• Children aged 6 mos to 4 yrs.
• Persons aged 50 yrs. and older
• Adults and children with immunosuppression
• Residents of nursing homes and other chronic-care facilities.

Flu Vaccine

• Each year, researchers identify 2 influenza A viruses and 2 influenza B viruses that are anticipated to circulate in the upcoming influenza season
• Seasonal trivalent vaccine protects against three influenza viruses (2 flu A and 1 flu B)
• Seasonal quadrivalent (new this year) protects against four influenza viruses (2 flu A and 2 flu B)
• Antibodies develop to flu vaccines in the body about two weeks after vaccination.
**What Kinds of Flu Vaccines Are Available?**

- There are two types of vaccines:
  - The “flu shot” - an inactivated vaccine (containing killed virus)
    - Approved for use in people older than 6 months, including healthy people and people with chronic medical conditions.
  - There are three different flu shots available:
    - A standard flu shot approved for people ages 6 months and older
    - A high-dose flu shot approved for people 65 and older
    - An intradermal flu shot approved for people 18 to 64 years of age

**What Kinds of Flu Vaccines Are Available? (cont.)**

- The nasal-spray flu vaccine - a vaccine made with live, weakened flu viruses that is given as a nasal spray (sometimes called LAIV for “Live Attenuated Influenza Vaccine”).
  - LAIV is approved for use in healthy people 2 through 49 years of age who are not pregnant.
  - All nasal spray vaccines for the 2013-14 season will provide protection against four flu viruses.

**Staff Vaccination: A Resident Safety Issue**

- Antibody response to vaccine reduced in the elderly (ACIP, 2013)
- Specific recommendations for healthcare providers (ACIP, 2013)
- Vaccinating healthcare personnel protects residents (Potter, 1997)


**Surveillance for Influenza and Influenza-like Illness**

New York State Department of Health (NYSDOH) - Healthcare Epidemiology and Infection Control Program


**Community Flu Activity**

New York State Department of Health (NYSDOH) - Influenza Activity, Surveillance and Reports


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**Definitions**

- **Influenza-like illness (ILI)**
  - Measured temperature* of 37.8°C [100°F] or greater
  - Cough or sore throat

* Infants, elderly adults, and immunocompromised persons may have atypical presentations (e.g., presenting without a fever, sepsis-like syndrome, or unexplained exacerbation of chronic lung/heart conditions).

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**Definitions**

- **Confirmed Influenza**
  - Positive laboratory test for influenza
  - Positive and negative rapid testing should be confirmed
  - Control measures should not be delayed pending results

- **Cluster**
  - One or more healthcare facility-associated cases of confirmed (by lab testing) influenza
  - Two or more cases of influenza-like illness among healthcare workers and residents on the same unit within 7 days
Line List

Testing for Flu

When to Test

Types of Tests
Influenza Testing

- Point of Care
  - Rapid Antigen Test (RAT)
    - May differentiate A vs B virus
- Culture or molecular (PCR) testing
  - Subtyping, antiviral resistance
- RAT positive / negative predictive value
  - Varies with extent of community activity
  - PPV highest at peak activity
  - NPV highest at no activity

Rapid Influenza Diagnostic Tests

- Point of Care – Rapid Antigen Test (RAT)
  - May differentiate A vs B virus
- Culture or molecular (PCR) testing
  - Subtyping, antiviral resistance
- RAT positive / negative predictive value
  - Varies with extent of community activity
  - PPV highest at peak activity
  - NPV highest at no activity

Influenza Antivirals

- Two drug classes
  - Adamantanes
    - Amantidine, Rimantidine
    - Not recommended for currently circulating strains
  - Neuraminidase inhibitors
    - Oseltamivir (Tamiflu®), zanamivir (Relenza®)
    - Active against both influenza A and B
- Treatment and prophylaxis doses vary
- Most effective within 48 hours of onset

CDC Antiviral Website

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Influenza Antiviral Treatment and Prophylaxis in LTC

- Antiviral treatment
  - Should be given for 5 days
  - Consider longer treatment courses for patients who remain severely ill after 5 days
- Antiviral chemoprophylaxis
  - House wide recommended (regardless of resident vaccination status)
  - Minimum of 2 weeks and up to 1 week after the most recent known case was identified


Infection Control in Healthcare Facilities

- Basic Principles
  - Hand Hygiene
  - Respiratory hygiene / cough etiquette
  - Exclusion of ill staff and visitors
  - Standard and Droplet precautions for routine care of patients with ILI
  - Airborne precautions for aerosol-generating procedures for patients with ILI

Preventing Transmission

- Prevent exposure
  - Early appropriate isolation/exclusion of ill persons
  - No ill visitors
  - Hypervigilance after known exposure
  - Don’t work ill

Exclusion of Ill Staff

- NYS Regulations - 10NYCRR415.26
  - Must be free from a health impairment which is of potential risk to the resident
  - Nursing homes must assess employee health status and take appropriate measures to protect residents
  - Resident safety is a facility’s responsibility
- Duration of exclusion
  - Clinical improvement and afebrile (off antipyretics) for at least 24 hours
  - Cough may persist for days to weeks
Exclusion of Ill Staff

- Presenteeism not productive or useful
  - Access to paid sick leave can reduce workplace illness up to 25% (Kumar, 2013)

- Additional considerations
  - Staff backup system
  - Do not require doctor’s note

Additional Considerations

Aggressive response is key to successful transmission control

- Limit group gatherings and activities
- Have contingency plans to avoid social isolation
- Limit staff floating
- Develop and enforce IC policies
- Have low threshold for applying precautions

Droplet Precautions

- Agents that generate large respiratory droplets
  - Do not remain suspended in the air for prolonged period
  - Do not travel far and maintain infectivity
- Mask when within 6 feet or upon room entry
  - Influenza
  - Pertussis

Airborne Precautions

- Agents that are transmitted by small particles (measles, TB)
  - Remain suspended and travel through air
  - Persist and remain infectious
  - Infect lower airway
- Requires N95 respirator or higher plus AIIR (Airborne Infection Isolation Room)
- Recommended for aerosol-generating procedures when flu suspected
  - Open airway suctioning
  - Emergency intubation
Duration of Isolation

• Minimum of 7 days and afebrile for at least 24 hours off antipyretics, whichever longer

• Until another diagnosis is made and influenza is ruled out
  – A negative RAT does not rule out influenza
  – Follow transmission-based precautions for new diagnosis

Cleaning

• Routine measures
  – Enforce existing policies
  – Concentrating on high touch surfaces
  – Consider increasing frequency

• Cleaning and disinfection
  – Clean visible soiling before disinfection
  – Use hospital-grade disinfectants according to manufacturer’s instructions
  – Dilute bleach acceptable

Reporting

• Healthcare-associated (nosocomial)
  – One or more lab confirmed influenza cases (any testing method)
  – Clusters of ILI

• Electronic reporting preferred
  – Nosocomial Outbreak Reporting Application (NORA) available on Health Commerce System

• Paper reporting
  – Often results in missing information that requires follow up with facility

http://www.health.ny.gov/professionals/diseases/reporting/communicable/infection/reporting.htm

11/6/2013
Case Study

- 1/1/13 Facility A identifies a case of ILI
- 1/9/13 ICP reports an outbreak
  - 30/198 (15% attack rate) residents with cough, low-grade temps, and congestion
  - No influenza testing ordered
    - Medical director stated all 30 residents ill with underlying respiratory comorbidities
    - Influenza widespread in NYS for past 6 weeks
  - Published recommendations for flu testing and house wide antiviral prophylaxis provided

Case Study

- 1/11/13 46 residents now ill
  - Two RAT + for flu A (1 resident, 1 staff)
  - NYSDOH contacted medical director to strongly encourage immediate outbreak control measures
  - Medical director refused to provide house wide prophylaxis ("too expensive"); only treating residents with positive lab results
- Facility referred to NYSDOH surveyors

Case Study

- 1/12/13 Medical director ordered antiviral treatment for all residents with ILI and 14 days of house wide prophylaxis
- 1/14/13 Case count up to 55 ill residents
  - NYS surveyors on site
- No further cases identified after 1/16/13
The Bottom Line…

• Prevention
  – Vaccine
  – Exclusion of ill
  – Hand hygiene/respiratory etiquette

• STAY UP TO DATE!!
  – NYSDOH Health Commerce System
  – NYSDOH public website
  – CDC website

That Was Then…

This Is Now

Contact Us

• NYSDOH Healthcare Epidemiology and Infection Control Program - 518-474-1142
  icp@health.state.ny.us

• Nosocomial Outbreak Reporting Application (NORA) - 518-474-1142
  nora@health.state.ny.us

• Health Commerce System (HCS)
  hinhp@health.state.ny.us
  866-529-1890 Option 1
  (8am-4:45pm ET, exc. weekends/holidays)
References

CDC Summary Recommendations: Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP):


Resources

Centers for Disease Control and Prevention (CDC): Prevention Strategies for Seasonal Influenza in Healthcare Settings:
http://www.cdc.gov/flu/professionals/seasonal/healthcare-settings.htm


NYSDOH Recommendations for Follow-up of Respiratory Disease Outbreaks of Influenza and Influenza-like Illness in Health Care Facilities: