Interventions to Prevent Influenza and Influenza Like Infections in the Retail Clinic Setting

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Retail Clinician Education Congress
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Learning Objectives

- Explain the epidemiology and symptoms associated with flu and influenza-like-infections in adults and children
- Review evidence-based research regarding nonpharmacologic interventions to prevent flu and influenza-like-infections in adults and children
- Recall strategies to teach patients and caregivers specific methods that will prevent flu and influenza-like-infections
- Categorize the place of anti-viral medications in therapy and discuss their indications, side effects, interactions, and special precautions
Flu Background

- The term “influenza” was used by an unknown Italian in the mid-1700’s to mean a disease resulting from miasma or “bad air”
- The human disease is thought to have arisen about 6000 years ago

While hospitalization costs are important contributors, lost productivity from missed work days and lost lives comprise the bulk of the economic burden of influenza.
Costs

- Direct medical costs averaged $10.4 billion annually.
- Projected lost earnings due to illness and loss of life amounted to $16.3 billion annually.
- The total economic burden of annual influenza epidemics using projected statistical life values amounted to $87.1 billion.

JC Requirements

- HOB’s influenza immunization rate for all staff was 75% in 2011. TJC has issued guidelines stating we must set incremental goals in order to reach a target of 90% by 2020. We must also measure and improve influenza vaccination rates for all staff annually. Please help us reach our goal of 80% for 2012.

Flu or Common cold

- Influenza A: fever, body aches, extreme tiredness, headache and dry cough (bronchospasm)
- Symptoms appear 18-72 hours post inoculation
- Common Cold: runny or stuffy nose, mildly sore throat

Flu or Influenza-like-illness (ILI)

- **Flu B**
  - Headache, sore throat, myalgias, nausea, fever sometimes, dry cough sometimes, fatigue

- **ILI**
  - Fever, rhinitis and cough

Influenza Like Infections

- RSV Respiratory Syncytial (bronchospasm)
- HPIV Parainfluenza virus HPIV -1 and -2 (croup)
- Human Adenovirus (HAdV) DNA
- Coronavirus
- Rhinovirus

Stomach Flu

- Describe illnesses with nausea, vomiting or diarrhea
- Sometimes be related to the flu
- More commonly in children than adults
- Flu is a respiratory disease and not a stomach or intestinal disease

Tests

Antigenic Drift vs. Shift

- **Antigenic drift**
  - Changes to the flu virus that happen slowly over time.
  - This causes the changes to the seasonal flu that require us to get vaccinated against the flu each year

- **Shift**
  - Results are sudden
  - Two different flu strains combine and infect the same cell creating a new flu subtype and may cause epidemic or Pandemic
  - This mutation is what allows flu viruses to move from animals to humans


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Drift

1. Each year’s flu vaccine contains three flu strains – two A strains and one B strain – that can change from year to year.

2. After vaccination, your body produces infection-fighting antibodies against the three flu strains in the vaccine.

3. If you are exposed to any of the three flu strains during the flu season, the antibodies will latch onto the virus’s HA antigens, preventing the flu virus from attaching to healthy cells and infecting them.

4. Influenza virus genes, made of RNA, are more prone to mutations than genes made of DNA.

5. If the HA gene changes, so can the antigen that it encodes, causing it to change shape.

6. If the HA antigen changes shape, antibodies that normally would match up to it no longer can, allowing the newly mutated virus to infect the body’s cells.

This type of genetic mutation is called “ANTIGENIC DRIFT.”

Vaccine Efficacy History

- 2012-13 VE <50%, 9% >65y.o.
- 2011-12 VE 52%
- 2010-11 VE: 96%
- 2009-10 VE 62%
- 2008-9 Flu A 99% Flu B 20%
- 2007-8 VE 44%
- 2006-7 VE Flu A “good match” Flu B 50%

Transmission

- The virus is usually transmitted through the air when an infected person coughs or sneezes.
- It can also be transmitted through direct contact.
- Patients begin to show signs and symptoms between 18 and 72 hours after being exposed.


Viral Shedding

- The CDC guidelines for the 2009 influenza season specifically recommend that healthcare workers who have a fever and respiratory symptoms stay home from work for 24 hours after fever subsides 24 hrs after fever subsides or, Megan of CDC a study by the U.S. Air Force demonstrated that viable virus was present in 24 percent of nasal wash samples from infected military trainees seven days after symptom onset.

Viral Shedding

- Another study reported that virus was undetectable by culture five days after symptom onset or by real-time RT-PCR at eight days among 21 of 22 hospitalized patients treated with oseltamivir.

Viral Shedding

- Most healthy adults may be contagious beginning 1 day before symptoms develop and up to 5 to 7 days after becoming sick
Surface Contamination

“90% of the commonly touched surfaces in a home are contaminated with the viral organism within 24 hours of the presence of a family member living in the home.”

Chuck Gerba, PhD (Dr. Germ)
Surface Cleaning

PDI
Clorox
Symmetry


AntiViral meds for prophylaxis

Persons at high risk for influenza complications during first 2 weeks post vaccination. Sever immune deficiencies who may not respond to vaccination (ie immunosuppressive meds), Those where vaccine is contraindicated due to contraindication or age, Residents of institutions and LTC facilities during influenza outbreaks in the institution

Antiviral meds: Who should Receive

- People who are at high risk for complications and children < 2 y.o.

Prepared by Anthony E. Fiore, MD, Alicia Fry, MD, David Shay, MD, Larisa Gubareva, PhD Joseph S. Bresee, MD, Timothy M. Uyeki, MD. Influenza Division, National Center for Immunization and Respiratory Diseases. Antiviral Agents for the Treatment and Chemoprophylaxis of Influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP). Recommendations and Reports January 21, 2011 / 60(RR01);1-24
Special Considerations for Long Term Care Facilities

Chemoprophylactic use of antiviral medications to control outbreaks among high risk persons in institutional settings is recommended.

Scott A. Harper,1 John S. Bradley,2,3 Janet A. Englund,4 Thomas M. File,6 Stefan Gravenstein,7,8 Frederick G. Hayden,9 Allison J. McGeer,14 Kathleen M. Neuzil,4,5 Andrew T. Pavia,10 Michael L. Tapper,11,12 Timothy M. Uyeki,1 and Richard K. Zimmerman13
When (timing)

Antiviral medication within 48 hours of symptom onset.

Or patients with severe, complicated or progressive illness

Hospitalized patients even if > 48 hours after onset of symptoms

Antivirals shorten course by 30% in children

- Shorten duration of fever and symptoms by ~30%
- Reduce severity of risk and complications by ~40%

CDC. Influenza antiviral medications.  
http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

AntiViral meds


- Neuraminidase inhibitors (oseltamivir and zanamivir) and adamantanes (amantadine and rimantidine).

AntiViral meds

- oseltamivir (Tamiflu®)
- zanamivir (Relenza®)
- adamantanes (amantadine and rimantidine)

Precautions

- Renal disease
- Liver disease
- Seizure disorder
- Immunosuppression

Prophylaxis Oseltamivir (Tamiflu)

- 75 mg qd (>40 Kg) for 5 days
- 60 mg qd (23-40 kg)
- 45 mg qd (15-23 kg)
- 30 mg qd (<15 kg)
- <1 y.o. 3 mg/kg/dose qd

"Influenza Antiviral Medications: Summary for Clinicians." 
Treatment Oseltamivir (Tamiflu)

- 75 mg bid (>40 Kg) for 5 days
- 60 mg bid (23-40 kg)
- 45 mg bid (15-23 kg)
- 30 mg bid (<15 kg)
- <1 y.o. 3 mg/kg/dose bid

Zanamivir (Relenza)

- **Treatment:**
  - 10 mg (2 5mg inhalations) bid Not for children < 7 y.o.

- **Prophylaxis:**
  - 10 mg qd Not for children < 5 y.o.


Adamantanes

- Rimantadine
  - > 10 y.o. is 200 mg/d
  - 1-9 y.o. is 6.6 mg/kg/d Rx or 5 mg/kg/d prophylaxis, neither > 150 mg/d
- Amantadine:
  - 1-9 y.o. 5-mg/kg/d, not > 150mg/d
  - 9-12 y.o. 200mg/d in divided dose.
  - > 12 y.o. 200 mg/d Rx or prophylaxis

Supplements as RX for flu/ILI/common cold

- Vitamin C, Zinc, Vitamin D


Epidemic influenza and vitamin D.
Cannell JJ, Vieth R, Umhau JC, Holick MF, Grant WB, Madronich S, Garland CF, Giovannucci E.


Vitamin C for preventing and treating the common cold.
Douglas RM, Hemila H, D'Souza R, Chalker EB, Treacy B.
Oseltamivir (Tamiflu) Adverse Reactions

- Nausea, vomiting. Sporadic, transient neuropsychiatric events (self injury or delirium) mainly reported among Japanese adolescents and adults.

Zanamivir (Relenza) Reacts

- **Adverse events:** diarrhea, nausea, sinusitis, nasal signs and symptoms, bronchitis, cough, headache, dizziness, and ear, nose and throat infections.

- **Allergic reactions:** oropharyngeal or facial edema.

Antiviral meds
interactions

Clinical data are limited regarding drug interactions with zanamivir. No known drug interactions have been reported, and no clinically critical drug interactions have been predicted on the basis of in vitro and animal study data.
Drug Interactions

Oseltamivir

Oseltamivir and oseltamivir carboxylate are excreted in the urine by glomerular filtration and tubular secretion via the anionic pathway, a potential exists for interaction with other agents excreted by this pathway. For example, coadministration of oseltamivir and probenecid resulted in reduced clearance of oseltamivir carboxylate by approximately 50% and a corresponding approximate twofold increase in the plasma levels of oseltamivir carboxylate.

In October 2008 H1N1 had 99% resistance to Oseltamivir, but not to H3N2 or B.
In 2007-08 only 10.9% resistance to Oseltamivir, then 2009-10 only 1.1%.

All Adamantanes were resistant 98% to H3N2 in 2008-09 and 10.7% in 2007-08.
Epidemic/Pandemic Prevention

- Positive Deviance Strategy
- 4 Principles of Hand Awareness
- Do Not Touch the T Zone
- Hawthorne Effect
- Habitual Excellence
- Theory of Planned Behavior
Public Health Interventions during 1918 Pandemic

Findings support the hypothesis that rapid implementation of multiple Non Pharmaceutical Interventions (NPIs) can significantly reduce influenza transmission, but that viral spread will be renewed upon relaxation of such measures.
Public Health Interventions during 1918 Pandemic

- Closing schools, churches, theaters, dance halls
- Banning funerals and public gatherings
- Isolation of sick persons

Not Reported during 1918 Pandemic

- Habits of putting one’s finger in the mucous membranes of the eyes, nose or mouth (T Zone)
- T Zone is the ONLY portal of entry into human body for ALL respiratory infections

Relative Contributions of Four Exposure Pathways to Influenza Infection Risk, Mark Nicas and Rachael M. Jones, Risk Analysis, Vol 29; Nov 9, 2009
Relative Contributions of Four Exposure Pathways to Influenza Infection Risk

- Virus-contaminated hand contact with facial membranes
- Inhalation of respirable cough particles
- Inhalation of inspirable cough particles,
- Spray of cough droplets onto facial membranes
Relative Contributions of Four Exposure Pathways to Influenza Infection Risk

- For the 1:1 infectivity ratio
  
  Virus-contaminated hand contact with facial membranes is the most important overall
For the 1:1 infectivity ratio, a virus saliva concentration of 10 log6/ml, virus-contaminated hand contact with facial membranes contributes to 93% of the infection risk.
T Zone

- The mucus membranes of the eyes, nose and mouth (facial membranes). Which are the ONLY portal of entry into the human body for Flu and Influenza Like Infections.
Face Masks and Hand Hygiene to prevent Transmission

- The authors concluded that if face masks plus hand hygiene were implemented within 36 hours of the onset of symptoms in the index patient, then the transmission of influenza was significantly decreased
  - adjusted odds ratio 0.33, 95% confidence interval 0.13 to 0.87
- This is likely to be an underestimate of the effect because of the study design.

4 Principles of Hand Awareness

1. WASH your hands when they are dirty and BEFORE eating.

2. DO NOT cough into your hands.

3. DO NOT sneeze into your hands.

4. Above all, DO NOT put your fingers into your eyes, nose, or mouth.

The 4 Principles of Hand Awareness have been endorsed by the AMA and AAFP since 2001.


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Do Not Touch the T Zone!

Remember it is the ONLY portal of entry into the human body for ALL respiratory infections!

Respiratory Etiquette

- Cover every cough or sneeze with a tissue or your arm/antecubital space
- Do not cough into your hands. (2nd Principle of Hand Awareness)
- Do not sneeze into your hands (3rd Principle of Hand Awareness)

Topic NEVER discussed when reviewing epidemiology of Pandemics or epidemics
Nor addressed for HAI prevention and Patient Safety

- Hand Awareness
- T Zone

NPI strategies:

- Individual can do to prevent:
  Practice Hand Awareness.
  Wear HealthShield for intentional behavior

- Theory of Planned Behavior, Icek Ajzen

1. Denial is not a river in Egypt! It is the #1 posture most hospital and LTCs take. More monitoring and feedback by leadership. Felix Aguirre, MD

2. I don’t always have time to wash my hands. Mark Graben of KaiNexus

3. There is never any soap

4. I didn’t know we had to wash our hands that way. Allison Aiello, PhD
Changing Behavior:

Hawthorne effect,

Re-training techniques,

Positive Deviance strategy

Soap and H2O

- The gold standard for removing loosely attached organisms, although not readily available or practiced in the office setting.
Sanitizers

Hands must be clean of organic matter

Alcohol content >60%

Andreas F. Widmer, MD, MS; Martin Conzelmann, MD; Milanka Tomic, RN; Reno Frei, MD; Anne M. Strandén, RN, PhD. Introducing Alcohol-Based Hand Rub for Hand Hygiene: The Critical Need for Training; Infection control and hospital epidemiology January 2007, Vol. 28, No. 1
Quaternarium Ammonium compounds

- benzalkonium halide compounds with varying chain lengths
- benzalkonium chloride
- benzethonium chloride
- methylbenzethonium chloride

Federal Register 333.450
Federal Register 333.92
Sanitizers

- Quaternary Ammonium
  Must be aware that pseudomonas species are most resistant to surface-active agents like Benzalkonium chloride. Particularly in the “usual concentrations” used.
  Effected by acidity and hardness of the water dilution.

Federal Register 333.450
Fed Reg 333.92
Sanitizer usage:

- Used proper amount (3 mL) 54 90 7.5 (3.4-16.5) !.001
- Applied for 30 s 61 85 3.7 (1.8-7.5) !.001
- Used recommended application technique 31 74 6.1 (2.1-11.8) !.001
- Wore no ring 47 39 0.7 (0.39-1.3) .28
- Reported skin diseases or allergies

Andreas F. Widmer, MD, MS; Martin Conzelmann, MD; Milanka Tomic, RN; Reno Frei, MD; Anne M. Strandøen, RN, PhD. Introducing Alcohol-Based Hand Rub for Hand Hygiene: The Critical Need for Training; Infection control and hospital epidemiology january 2007, vol. 28, no. 1
SaniTwice for Clean Hands

1. Apply Sanitizer
2. Rub all over hands
3. Towel wipe
4. Apply Sanitizer Again
5. Air Dry

SANITIZING TWICE GETS RID OF GERMS ON YOUR HANDS WITH A PAPER TOWEL

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Preventing Flu/ILI

- T Zone, Healthshield, Vaccines
Questions

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