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

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- Major stock/shareholder

– None

Discussion of off-label uses

– None

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-likeinfections
- 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

"Influenza." *Influenza*. N.p., n.d. Web. 07 May 2013. <http://www.medicalecology.org/diseases/inf luenza/influenza.htm>.

Seasonal impact of flu/ILI \$ and absenteeism

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

The annual impact of seasonal influenza in the US: measuring disease burden and costs. Molinari NA, Ortega-Sanchez IR, Messonnier ML, Thompson WW, Wortley PM, Weintraub E, Bridges CB. Vaccine. 2007 Jun 28;25(27):5086-96. Epub 2007 Apr 20.

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

The annual impact of seasonal influenza in the US: measuring disease burden and costs. Molinari NA, Ortega-Sanchez IR, Messonnier ML, Thompson WW, Wortley

<u>PM, Weintraub E, Bridges CB</u>. Vaccine. 2007 Jun 28;25(27):5086-96. Epub 2007 Apr 20.

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.

"The Joint Commission." *Health Services Research*. N.p., n.d. Web. 22 Mar. 2013. <http://www.jointcommission.org/health_services_resear ch.aspx>.

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

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 13 Mar. 2013. Web. 17 Mar. 2013. .

Flu or Influenza-likeillness (ILI)

Flu B

Headache, sore throat, myalgias, nausea, fever sometimes, dry cough sometimes, fatigue

ILI

Fever, rhinitis and cough

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 13 Mar. 2013. Web. 17 Mar. 2013. .

Influenza Like Infections

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

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 13 Mar. 2013. Web. 17 Mar. 2013. .">http://www.cdc.gov/flu/>.

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

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 13 Mar. 2013. Web. 17 Mar. 2013. .



Tests

 FilmArray respiratory panel rapid test. Rand JCM 2011: 49: 2449, Portiz, PLoS One 2011; 6:e26047, Loeffelholz, JCM 2011; 49:4083. John G Bartlett, MD Professor epidemiology and Infectious Disease

"Influenza Antiviral Medications: Summary for Clinicians." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013. <http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm>.

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

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 This mutation is what allows flu viruses to move from animals to humans

"How the Flu Virus Can Change: "Drift" and "Shift"." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 08 Feb. 2011. Web. 18 Mar. 2013. <http://www.cdc.gov/flu/about/viruses/change.htm>.



Drift

Antigenic Drift. N.d. Photograph. *CDC*. Web. 15 Mar. 2013. <http://www.cdc.gov/flu/about/viruses/change.htm>.

The genetic change that enables a flu strain to jump from one animal species to another, including humans, is called "ANTIGENIC SHIFT." Antigenic shift can happen in three ways:



Shift

Antigenic Shift. N.d. Photograph. *CDC*. Web. 15 Mar. 2013. <http://www.cdc.gov/flu/about/viruses/change.htm>.

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%

"Evaluating Influenza Vaccine Efficacy and Effectiveness Studies." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 30 Nov. 2012. Web. 21 Mar. 2013. <http://www.cdc.gov/flu/professionals/acip/evaluating.htm>.

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

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Cowling BJ, Chan KH, Fang VJ, Cheng CKY, Fung ROP, Wai W, et al. Facemasks and hand hygiene to prevent influenza transmission in households: a randomized trial. Ann Intern Med 2009;151. vol 7:pp. 437-446.

Raymond Tellier, Aerosol transmission of influenza A virus: a review of new

studies J R Soc Interface. 2009 December 6; 6(Suppl_6): S783–S790.

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.

Kay M, Zerr DM, Englund JA, Cadwell BL, Kuypers J, Swenson P, Kwan-Gett TS, Bell SL, and Duchin JS. Shedding of Pandemic (H1N1) 2009 Virus among Health Care Personnel, Seattle, Washington, USA. Emerging Infectious Diseases. April 2011.

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

Kay M, Zerr DM, Englund JA, Cadwell BL, Kuypers J, Swenson P, Kwan-Gett TS, Bell SL, and Duchin JS. Shedding of Pandemic (H1N1) 2009 Virus among Health Care Personnel, Seattle, Washington, USA. Emerging Infectious Diseases. April 2011.

Viral Shedding

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

Kay M, Zerr DM, Englund JA, Cadwell BL, Kuypers J, Swenson P, Kwan-Gett TS, Bell SL, and Duchin JS. Shedding of Pandemic (H1N1) 2009 Virus among Health Care Personnel, Seattle, Washington, USA. Emerging Infectious Diseases. April 2011.

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

"Material Safety Data Sheets." *Symmetry™*. N.p., n.d. Web. 26 Mar. 2013. <http://www.symmetryhandhygiene.com/>.

The Clorox ® *Company*. N.p., n.d. Web. 11 Mar. 2013. <http://www.clorox.com/>.

"Welcome to PDI - Healthcare." *Healthcare*. N.p., n.d. Web. 11 Mar. 2013. <http://www.pdipdi.com/healthcare/>.

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 immunesuppressive meds), Those where vaccine is contraindicated due to contraindication or age, Residents of institutions and LTC facilities during influenza outbreaks in the institution

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 Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management: Clinical Practice Guidelines of the Infectious Diseases Society of America http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Infuenza.pdf

Antiviral meds: Who should Receive

People who are at high risk for complications and children < 2 y.o.</p>

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

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 Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management: Clinical Practice Guidelines of the Infectious Diseases Society of America http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Infuenza.pdf

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

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 13 Mar. 2013. Web. 17 Mar. 2013. <http://www.cdc.gov/flu/>.

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. <u>http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm</u>

Treanor JJ, Hayden FG, Vrooman PS, et al. Efficacy and safety of the oral neuraminidase inhibitor oseltamivir in treating acute influenza: a randomized controlled trial. JAMA. 2000;283:1016-1024.

AntiViral meds

 Amantadine, acyclovir, Adamantane, valtrex, oseltimavir Zanamivir(MMWR 2011 60:1). (Louie, J. CID 2012; 55:1198).

neuraminidase inhibitors (oseltamivir and zanamivir) and adamantanes (amantadine and rimantidine).

Neuraminidase inhibitors for preventing and treating influenza in healthy adults: a Cochrane review. T Jefferson,1* M Jones,2 P Doshi,3 C Del Mar,4 L Dooley4 and R Foxlee5. *Health Technology Assessment* 2010; Vol. 14: No. 46, 355–458

AntiViral meds

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

Neuraminidase inhibitors for preventing and treating influenza in healthy adults: a Cochrane review. T Jefferson,* M Jones, P Doshi, C Del Mar, L Dooley and R Foxlee. *Health Technology Assessment* 2010; Vol. 14: No. 46, 355–458

Precautions

Renal disease
Liver disease
Seizure disorder
Immunosuppression

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 13 Mar. 2013. Web. 17 Mar. 2013. <http://www.cdc.gov/flu/>.

Prophylaxis Oseltamivir (Tamiflu)

75 mg qd (>40 Kg) for 5 days
60mg qd (23-40kg)
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." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013.

<http://www.cdc.gov/flu/professionals/antivirals/summaryclinicians.htm>.

Treatment Oseltamivir (Tamiflu)

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

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"Influenza Antiviral Medications: Summary for Clinicians." *Centers for Disease Control and Prevention.* Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013. <http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm>.

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.

"Influenza Antiviral Medications: Summary for Clinicians." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013. <http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm>.

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

"Influenza Antiviral Medications: Summary for Clinicians." *Centers for Disease Control and Prevention.* Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013. http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm.

Supplements as RX for flu/ILI/common cold

Vitamin C, Zinc, Vitamin D

Epidemiology and Infection. 2006 Dec;134(6):1129-40. Epub 2006 Sep 7. **Epidemic influenza and vitamin D.** <u>Cannell JJ</u>, <u>Vieth R</u>, <u>Umhau JC</u>, <u>Holick MF</u>, <u>Grant WB</u>, <u>Madronich S</u>, <u>Garland CF</u>, <u>Giovannucci E</u>.

Cochrane Database Systematic Review: 2004 Oct 18;(4):CD000980. **Vitamin C for preventing and treating the common cold.** <u>Douglas RM</u>, <u>Hemila H</u>, <u>D'Souza R</u>, <u>Chalker EB</u>, <u>Treacy B</u>.

Oseltamivir (Tamiflu) Adverse Reactions

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

"Influenza Antiviral Medications: Summary for Clinicians." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013. http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm.

Zanamivir (Relenza) Reactions

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.

"Influenza Antiviral Medications: Summary for Clinicians." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 22 Dec. 2012. Web. 25 Mar. 2013. <http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm>.

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.

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

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.

"Drugs." *Influenza (Flu) Antiviral and Related Information*. N.p., n.d. Web. 13 Apr. 2013. http://www.fda.gov/drugs/drugsafety/informationbydrugclass/ucm100228.htm

Antiviral Resistance

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

Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 02 Mar. 2013. Web. 13 Mar. 2013. .">http://www.cdc.gov/mmwr/>.

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

Kuhl,J Beckman,J. Action Control: From Cognition to Behavior: Chapter 2 From Intentions to Actions: A Ajzen, Icek.Theory of Planned Behavior. 1985; 11-39.

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 and Epidemic Intensity During the 1918 Influenza Pandemic. <u>Hatchett RJ</u>, <u>Mecher CE</u>, <u>Lipsitch</u> <u>M. Proc Natl Acad Sci U S A.</u> 2007. May 1;104(18):7582-7. Epub 2007 Apr 6

Public Health Interventions during 1918 Pandemic

Closing schools, churches, theaters, dance halls

Banning funerals and public gatherings
 Isolation of sick persons

Public Health Interventions and Epidemic Intensity During the 1918 Influenza Pandemic. <u>Hatchett RJ</u>, <u>Mecher CE</u>, <u>Lipsitch M</u>. <u>Proc Natl Acad</u> <u>Sci U S A.</u> 2007. May 1;104(18):7582-7. Epub 2007 Apr 6

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, Mark Nicas and Rachael M. Jones, Risk Analysis, Vol 29; Nov 9,2009



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

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

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.

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

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.

"Henry The Hand - Champion Handwasher -Welcome Champion Handwashers!" *Henry The Hand - Champion Handwasher - Welcome Champion Handwashers!* N.p., n.d. Web. 06 May 2013. <http://www.henrythehand.com/>.

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.

Cowling BJ, Chan KH, Fang VJ, Cheng CKY, Fung ROP, Wai W, et al. Facemasks and hand hygiene to prevent influenza transmission in households: a randomized trial. Ann Intern Med 2009;151. vol 7:pp. 437-446.

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.

"Henry The Hand - Champion Handwasher - Welcome Champion Handwashers!" *Henry The Hand - Champion Handwasher - Welcome Champion Handwashers!* N.p., n.d. Web. 06 May 2013. <http://www.henrythehand.com/>.



Do Not Touch the T Zone!

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

"Henry The Hand - Champion Handwasher -Welcome Champion Handwashers!" *Henry The Hand - Champion Handwasher -Welcome Champion Handwashers!* N.p., n.d. Web. 06 May 2013. <http://www.henrythehand.com/>.

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)

"Henry The Hand - Champion Handwasher - Welcome Champion Handwashers!" *Henry The Hand - Champion Handwasher - Welcome Champion Handwashers!* N.p., n.d. Web. 06 May 2013. <http://www.henrythehand.com/>.

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

Hand AwarenessT Zone

Raymond Tellier, **Aerosol transmission of influenza A virus: a review of new studies** J R Soc Interface. 2009 December 6; 6(Suppl_6): S783–S790.

NPI strategies:

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

Theory of Planned Behavior, Icek Ajzen

Kuhl, J Beckman, J. Action Control: From Cognition to Behavior. Chapter 2 From Intentions to Actions: A Theory of Planned Behavior. 1985; 11-39

HH in HC 4 Common Culprits as

EXCUSES, Sabrina Rodak, April 2013

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

Why is Hand Hygiene Still a Problem in Healthcare? 4 Common Culprits, sabrina Rodak . Becker's Clinical Quality and Infection Control April 04, 2013

Changing Behavior:

Hawthorne effect,

Re-training techniques,

Positive Deviance strategy

Kuhl, J Beckman, J. Action Control: From Cognition to Behavior: Chapter 2 From Intentions to Actions: A Ajzen, Icek. Theory of Planned Behavior. 1985; 11-39.

Soap and H2O

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

"The Handwashing Leadership Forum®." *Handwashing for Life Foodservice*. N.p., n.d. Web. 15 Apr. 2013. <http://www.handwashingforlife.com/leadership-forum>.

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. Stranden, 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 333.450Federal Register 333.92

Sanitizers

Quaternary Ammonium Must be aware that pseudomonas species are most resistant to surfaceactive agent s like Benzalkonium chloride. Particularly in the "usual concentrations" used. Effected by acidity and hardness of the water dilution. Federal Register 333.450 **Retail Clinician Education Congress** 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. Stranden, 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



Edmonds, Sarah, McCormack, R., Fricker, C./, Macinga, D. SanniTwice: A Hygiene Solution for Reducing Contamination on Heavily Soiled Hands When Water is Unavailable. IAFP_2010.ppt 1-23

Preventing Flu/ILI

T Zone, Healthshield, Vaccines

Questions

Dr.will@henrythehand.com

