Nosocomial Influenza and Vaccination of Healthcare Workers
Dr. Helena Maltezou, Hellenic Center for Disease Control and Prevention
A Webber Training Teleclass

Nosocomial Influenza

and Vaccination of Healthcare Workers

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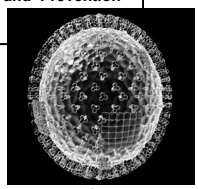

Hosted by Paul Webber

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www.webbertraining.com **October 6, 2011**

«Ωφελε ν ή μη βλάπτε ν»

"First do not harm"

Hippocrates (460-377 BC)

Seasonal influenza every year

- **3-5% of human population is affected each year**
- **3-5 million serious infections**
- **250.000 - 500.000 deaths**

- **peak of visits to health-care facilities**
- **peak of admissions in hospitals**

Seasonal influenza in developed countries

- **The most frequent vaccine-preventable disease**
- **Every year**

  36,000 deaths in the United States

  40,000 deaths in the European Union

- **United States Advisory Committee on Immunization Practices**
- **European Centre for Disease Control and Prevention**

Epidemiology of nosocomial influenza

- **Follows the activity of influenza in the community**
- **Extremely fast spread within closed settings**
- **Crowded wards and staff shortage facilitate influenza transmission and onset of outbreaks**
- **Very high influx and rapid turnover of patients in health-care facilities**

Nosocomial influenza outbreaks

- **Intensive Care Units**
- **Neonatal Intensive Care Units**
- **Pulmonary Departments**
- **Neurologic - Psychiatric Departments**
- **Bone Marrow Transplantation Units**
- **Long-Term Care Facilities**

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Nosocomial influenza outbreaks (cont)

- Attack rate up to 55.6% among patients and up to 18.1% among personnel *
- Up to 25% case fatality rate among neonates in Neonatal Intensive Care Units (NICUs)**

Maltezou HC, Drancourt M. Nosocomial influenza in children. Journal of Hospital Infection 2003;55:83-91

Meara et al. Influenza A outbreak in a community hospital. *Ir Med J* 2006;99: 175-177

Which patients are at risk from nosocomial influenza ?

Nosocomial Influenza

Serious morbidity and mortality

- Patients with underlying diseases
- Immunocompromised patients
- Neonates and young infants
- Elderly

Maltezou HC. Nosocomial influenza: new concepts and practice. *Current Opinion of Infectious Diseases* 2008;21: 337-343

High risk groups of patients

- allogeneic bone marrow transplant recipient
- 68 y.o. with Chronic Obstructive Pulmonary Disease
- neonates in NICUs

- underlying diseases
- low vaccination rates
- limited immunologic response post - vaccination
- frequent use of health - care services
- frequent visits - admissions
- prolonged hospitalization

Outbreak of influenza A H1N1 2009 in a Oncology Department and a Bone Marrow Transplantation Unit

- 8 (38%) among 29 patients were infected
- 5 patients developed severe pneumonia
- 3 patients were transferred to the Intensive Care Unit
- 2 patients died of influenza and 1 due to his underlying disease
- 2 of the patients who survived remained under oxygen for 2 and 3 months, respectively.

Lalayanni et al. Outbreak of novel influenza A (H1N1) in an adult haematology department and haematopoietic cell transplantation unit: clinical presentation and outcome. *Journal of Infection* 2010;61:270-2

Indirect impact of nosocomial influenza

- Increase medical costs
  (diagnosis, prolonged hospitalization, treatment, prophylaxis, isolation)
- Absence of health-care workers
- Disruption of health-care services

* Hansen et al. Closure of medical departments during nosocomial outbreaks: data from a systemic analysis of the literature. *Journal of Hospital Infection* 2007;65: 348-353

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Study of 1.561 nosocomial epidemics

- 38.5% closure rates in wards or departments during nosocomial influenza outbreaks.
- influenza constituted the cause of closing a whole health-care facility because of an epidemic in 3 out of 10 cases.

* Hansen et al. Closure of medical departments during nosocomial outbreaks: data from a systemic analysis of the literature. *Journal of Hospital Infection* 2007;65:348-353

Sources for spread of nosocomial influenza

Patients with undiagnosed influenza

Visitors

Unvaccinated health-care workers

Maltezou HC. Nosocomial influenza: new concepts and practice. *Current Opinion in Infectious Diseases* 2008;21:337-343

Health-care workers continue to work often despite the presence of influenza-like symptoms.

Modes of Influenza Transmission

- Inhalation of large particles (cough – sneezing)
- Direct or indirect contact
- Inhalation of small particles (aerosol – generating procedures)

Shedding of influenza virus

- In adults with underlying diseases and young children for > 1 week
- In immunocompromised patients: for weeks to several months
  - ➡ risk for emergence of resistance strains
  - ➡ risk for nosocomial spread

Englund et al. Oseltamivir-resistant novel influenza A (H1N1) virus infection in two immunosuppressed patients – Seattle, Washington, 2009 *MMWR Morb Mortal Wkly Rep* 2009;58: 893-6

Influenza viruses may survive on surfaces and transfer to the hands of health-care personnel and vice versa.

* Kramer et al. How long do nosocomial pathogens persist on inanimate surfaces? A systemic review. *BMC Infect Dis* 2006;6:130-138

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Influenza A H1N1 virus was detected on multiple occasions on the hands of health-care workers (HCWs) and in inanimate objects up to 17 days after the diagnosis of influenza and 72 h after discharge of the patient and the implementation of routine cleaning.

Macias et al. Controlling the novel (H1N1) influenza virus: don't touch your face! *Journal of Hospital Infection* 2009;73:280-291

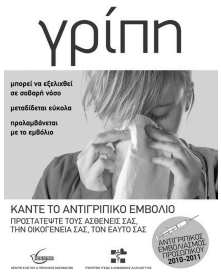
HCWs vaccination against influenza …

The Main preventive measure against transmission of influenza within health-care facilities

Why should HCWs get vaccinated against influenza ?

in order to protect

- themselves – occupational infection
- their vulnerable patients
- the essential health-care services



HCWs vaccination against influenza

The goal is to protect patients at high risk for complications from nosocomial transmission of influenza.

- Frequent visits – admissions
- Prolonged hospitalization

Herd immunity

Influenza vaccination of HCWs in long-term care facilities

- ⇓⇓ total mortality
- ⇓⇓ total mortality from influenza-like illness
- ⇓⇓ admissions in hospitals

- Potter et al. Influenza vaccination of healthcare workers in long-term-care hospitals reduces the mortality of elderly patients. *J Infect Dis* 1997;175:1-6
- Lemaitre et al. Effect of influenza vaccination of nursing home staff on mortality of residents: a cluster-randomized trial. *J Am Geriatr Soc* 2009;57:1580-6
- Hayward et al. Effectiveness of an influenza vaccine programme for care home staff to prevent death, morbidity, and health care use among residents: cluster randomized controlled trial. *Br Med J* 2006;333:1241
- Carman et al. Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomized controlled trial. *Lancet* 2000;355:93-7

Advantages from the implementation of influenza vaccination programs for HCWs within health-care facilities

- ⇓⇓ influenza episodes
- ⇓⇓ febrile respiratory infections
- ⇓⇓ absence from work

1. Dunais et al. Influenza vaccination: impact of an intervention campaign targeting hospital staff. *Infect Control Hosp Epidemiol* 2006;27:529-531
2. Pearson et al. Influenza vaccination of health-care personnel. Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2006;55:1-16
3. Wilde et al. Effectiveness of influenza vaccine in healthcare professionals. *JAMA* 1999;281;908-913

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Vaccination against influenza of HCWs and nosocomial influenza

Onset of influenza nosocomial outbreaks when vaccination rates among HCWs were low

1. Dharan et al. Outbreak of antiviral drug-resistant influenza A in long-term care facility, Illinois, USA, 2008. *Emerg Infect Dis* 2009;15:1973-1976
2. Outbreaks of 2009 pandemic influenza A (H1N1) among long-term-care facility residents- three States, 2009. *MMWR Morb Mortal Wkly Rep* 2010;59:74-75

Influenza vaccination and nosocomial influenza

High influenza vaccination rates among HCWs are associated with limited spread of influenza among patients.

1. Salgado et al. Preventing nosocomial influenza by improving the vaccine acceptance rate if clinicians. *Infect Control Hosp Epidemiol* 2004;25:923-928
2. Weinstock et al. Control of influenza A on a bone marrow transplant unit. *Infect Control Hosp Epidemiol* 2000;21:730-732

Vaccination coverage among HCWs

- low vaccination rates worldwide (< 40%)
- mandatory vaccination in US hospitals: > 98%

1. Maltezou HC. Nosocomial influenza: new concepts and practice. *Current Opinion of Infectious Diseases* 2008;21: 337-343
2. Babcock HM et al. Mandatory influenza vaccination of health care workers: translating policy to practice. *Clinical Infectious Diseases* 2010;50:459-464

Reasons for refusing vaccination against influenza among HCWs in Greece

Not at risk from contracting influenza	43.2%
Fear of vaccine adverse events	33.4%
Believes the vaccine is not effective	19.2%
Ignorance of recommendations for HCWs vaccination	3.8%

* Answers of 2,791 HCWs from 61 public hospitals who refused vaccination

Maltezou et al. Influenza vaccination acceptance among health-care workers: a nationwide survey. *Vaccine* 2008;26: 1408-1410

Organization of HCW vaccination campaigns within health-care facilities

Begin as soon as possible

Should target all personnel
(temporary, students, volunteers, all swifts)

Priority:

- HCWs in high-risk departments
- HCWs in direct contact with patients

Provide several opportunities for vaccination

Strategies associated with high vaccination rates

- vaccination at the hospital
- vaccination free of charge
- use of mobile vaccination charts
- organization of vaccination campaigns
- organization of lectures about vaccine safety and efficacy
- use of reminding systems
- mandatory vaccination

Maltezou, Tsakris. Vaccination of HCWs against influenza: our obligation to protect our patients. *Influenza and Other Respiratory Viruses Journal* 2011 [Epub ahead of print]

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The need to protect the patients and ensure a safe health-care environment constitutes the basis for the clinical practice since the era of Hippocrates.

Thank you for your attention !

Helena Maltezou

COMING SOON …

04 October 11	(Free WHO Teleclass) **MRSA – Is Search & Destroy the Way to Go?** Speaker: Prof. Andreas Voss, Nijmegen University Medical Center, Netherlands Sponsor: World Health Organization First Global Patient Safety Challenge: Clean Care is Safer Care (www.who.int/gpsc/en)
13 October 11	**Infection Prevention and Control in Long Term Care Facilities** Speaker: Prof. Borg Marit Anderson, Oslo University, Norway Sponsor: Diversey Inc. (www.diversey.com)
26 October 11	(South Pacific Teleclass) **Public Health Lessons Learned From the Christchurch Earthquakes** Speaker: Dr. Ramon Pink, University of Otago, New Zealand
27 October 11	**The Role of Microbial Biofilms in Chronic Bacterial Infections** Speaker: Dr. William Costerton, Center for Genomic Sciences
03 November 11	**How Should We Clean Our Hospitals** Speaker: Dr. Stephanie Dancer, NHS Lanarkshire, Scotland Sponsor: Diversey Inc (www.diversey.com)
10 November 11	**Infection Prevention Challenges in Home Care** Speaker: Mary McGoldrick, Home Health System Inc.

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