2009 H1N1 Influenza Vaccination, Protective Counter Measures, and Respiratory Protection for EMS Personnel

2009 H1N1 Influenza
Keeping EMS Personnel Healthy

- The current 2009 H1N1 Influenza Pandemic presents numerous challenges in keeping our EMS personnel healthy (and on the job).
- EMS personnel are on the “frontlines” of our healthcare system.
- The nature of EMS places our personnel at higher risk for becoming infected with the 2009 H1N1 Influenza.
- Following these simple guidelines will help to protect the health of our EMS workforce and their families, EMS patients, and the public at large.

How EMS can avoid becoming ill…

- For EMS personnel to avoid becoming ill with influenza, multiple protective actions must be embraced:
  - Get vaccinated for both H1N1 and seasonal flu
    - The vaccine is safe, effective and protects you, your family, your friends, your patients and the public.
  - Practice strict hand hygiene
  - Minimize exposure to infected patients
  - Maximize use of ambulance ventilation systems
  - Use proper respiratory protective equipment
- This course will cover each of these areas

Stay Current!

- The information provided in this presentation is based on the most current information available at the time it was produced.
- Based on new and evolving information, these recommendations may likely change.
- It is very important that all healthcare personnel stay as current as possible as recommendations and guidelines change.
- Reliable sources of information:
  - www.flu.gov
  - www.michigan.gov/flu
  - www.cdc.gov/h1n1

Course Contents

- H1N1 Vaccination
- Protective Countermeasures
- Respiratory Protection

EMS Personnel and Influenza Vaccinations

Why Do You Need to be Vaccinated?

- To protect yourself!
  - Vaccination is one of the single most important things to do to prevent acquiring influenza
- To protect your patient!
  - EMS personnel care for patients in close quarters and may easily spread influenza to their patients
- To protect your friends and family!
  - EMS personnel who are vaccinated are much less likely to pass influenza onto their family and friends
- To protect the public!
  - If a significant number of EMS personnel are off the job with influenza, the public may suffer because of delayed availability of EMS

2009 H1N1 Influenza

- Distribution of cases by age group is markedly different compared to seasonal influenza
  - Higher proportion of hospitalized cases in children and young adults
  - Few cases in older adults
  - No outbreaks among elderly in long term care facilities
- Older adults have evidence of immunity already, presumably based on exposures to somewhat similar viruses in early 20th century

Influenza Target Group Comparison

Seasonal Flu Target Groups	2009 H1N1 Initial Target Groups
Pregnant women	Pregnant women
Children aged 6 mo-18 yrs	Persons aged 6 mo-24 yrs
Persons aged 19-49 yrs with a medical condition* that puts them at higher risk	Persons aged 25-64 yrs with a medical condition* that puts them at higher risk ±
Adults aged 50 yrs and older	± see below
Health care personnel	Health care personnel and emergency medical services personnel
Persons living with or caring for children birth-4 yrs, adults over 49 yrs & those with a medical risk condition	Persons living with or caring for infants less than 6 mo of age
Residents of long-term care facilities	± see below

± **Expanding vaccination beyond initial target groups:** When it is determined by state and local health departments that vaccine is in greater supply, vaccinate 1) healthy persons 25-64 yrs of age and then 2) persons 65 years of age and older

* **See next slide for list of medical conditions**

What are the Medical Risk Conditions that Makes Influenza Vaccination a Higher Priority?

- Medical risk conditions are similar for both seasonal and 2009 H1N1 and include:
  - Children 6 mo-18 years on long-terms asprin therapy
  - Persons with the following conditions or disorders:
  - chronic pulmonary (including asthma)
  - Cardiovascular (except hypertension)
  - Renal or hepatic
  - Neurologic or neuromuscular
  - Hematologic or metabolic (including diabetes)
  - Immunosuppression (including that caused by medications or HIV)

2009 H1N1 Vaccine

- Novel influenza A (H1N1) vaccines produced using methods similar to those for seasonal vaccine
- Licensure of novel influenza A (H1N1) 2009 vaccine based on the same standards used for seasonal influenza vaccines
- As with seasonal influenza vaccines, none of the influenza A (H1N1) 2009 vaccines currently licensed contain an adjuvant

Use of Influenza A (H1N1) 2009 Monovalent Vaccine Recommendations of the ACIP 2009, MMWR August 21, 2009

Two Types of 2009 H1N1 Influenza Vaccine

- Influenza A (H1N1) 2009 Monovalent Vaccine (Inactivated)
  - Given IM
  - For persons 6 months of age or older
  - May be given to any person at high risk due to a medical condition, including pregnant women

- Influenza A (H1N1) 2009 Monovalent Vaccine (Live, Attenuated)
  - Given Intranasal
  - An option for vaccinating ***healthy*** non-pregnant persons aged 2-49 years only
  - Do not administer to:
    - Children 2-4 years of age with a history of wheezing
    - Persons with a chronic medical condition

Health Care Personnel (HCP) & Seasonal Influenza Vaccination

- Only 44% of HCP in the U.S. received seasonal influenza vaccine in 2006-2007
- HCP often work while ill, exposing vulnerable patients and their coworkers to influenza
- HCP can spread influenza if infected
  - Virus can be shed before symptoms develop
- HCP have caused outbreaks among patients in health care settings

Vaccination Myths

- Myth: The new H1N1 vaccine is experimental and dangerous
  - Fact: The 2009 H1N1 vaccine is produced using the same processes for seasonal vaccine which is extremely safe.
- Myth: You can actually get the flu when you are vaccinated
  - Fact: Influenza vaccine does NOT cause influenza
- Myth: The nasal vaccine can not be administered to healthcare workers.
  - Fact: The nasal vaccine is safe for healthy, non-pregnant healthcare workers under 50 years old; except those who care for severely immunocompromised patients (e.g., bone marrow transplant patients in special isolation).

The 2009-2010 Flu Vaccine Season

- Unprecedented public health effort
- Uniform risk communication vital
  - Information and expectations changing often
  - Anti-vaccine movements
  - Vaccine safety concerns

2009 H1N1 Protective Countermeasures for EMS Personnel

Protective Counter Measures

- Protective Countermeasures
  - Hand Hygiene
  - Operational Protective Countermeasures
  - Environmental Protective Countermeasures
- Goal: Minimize exposure to virus
- Acute Febrile Respiratory Illness
  - Fever AND cough, runny nose, or sore throat
  - AKA: Influenza-Like Illness

Hand Hygiene for EMS

- Healthcare personnel should perform hand hygiene frequently, including before and after all patient contact, contact with respiratory secretions, and before putting on and upon removal of PPE.
  - Soap and water or alcohol-based hand sanitizers should be used.
  - See http://www.cdc.gov/Handhygiene/ for additional information

Special Considerations for Using Gloves in Nursing Homes and Long Term Care Facilities

- EMS personnel frequently and appropriately don protective equipment (particularly disposable gloves) prior to arriving on scene.
- When responding to nursing homes and long term care facilities, EMS personnel should NOT don gloves until immediately prior to patient contact.
  - Gloves donned in the EMS vehicle may potentially transmit influenza (and other infectious diseases) into the nursing home or long term care facility

Operational Protective Countermeasures

- Dispatch Pre-arrival Notification
  - Dispatch questions callers regarding possible AFRI
  - Dispatch notifies EMS responders of possible AFRI
- Universal EMS Screening for AFRI
  - Immediately upon arrival, EMS inquires about AFRI
  - When possible ask screening questions from >6 ft. away
  - If patients screen negative for AFRI, follow standard precautions
- Limit EMS personnel in proximity to AFRI patients
  - Minimize personnel entering the residence
  - Keep unneeded personnel out of 6 feet exposure zone
  - Limit personnel in patient compartment of ambulance

Environmental Protective Countermeasures

- Goal: Limit exposure to EMS personnel in ambulance

- Environmental Countermeasures
  - Isolate driver and front seat passenger whenever possible
  - Maximize ambulance ventilation and airflow systems
  - Clean ambulance thoroughly after suspected influenza patient

Isolate Driver and Front Seat Passenger Compartment

- Close interior door connecting front and rear compartments when possible

- Consider improvised temporary partition between front and rear compartments

Maximize Ambulance Ventilation and Airflow Systems

- Turn fan to maximum setting in ambulance cab.
- Turn patient care compartment exhaust ventilation to maximum

Clean Ambulances Thoroughly After Influenza Patient Transports

- After the patient has been removed and prior to cleaning, the air within the vehicle may be exhausted by opening the doors and windows of the vehicle while the ventilation system is running. This should be done outdoors and away from pedestrian traffic.

- Routine cleaning and disinfection practices may play a role in minimizing the spread of influenza. Routine cleaning with soap or detergent and water to remove soil and organic matter, followed by the proper use of disinfectants, are the basic components of effective environmental management of influenza.

Key Considerations for Ambulance Cleaning

- Clean and disinfect non-patient-care areas of the vehicle.
- Wear non-sterile, disposable gloves while cleaning the patient-care compartment and when handling cleaning and disinfecting solutions.
  - Dispose of gloves if they become damaged or soiled or when cleaning is completed, in a sturdy leak proof bag that is tied shut and not reopened.
- Frequently touched surfaces in patient-care compartment that become directly contaminated with respiratory secretions and other bodily fluids during patient care, or indirectly by touching the surfaces with gloved hands, should be cleaned first with detergent and water and then disinfected.

More Considerations for Ambulance Cleaning

- Non-porous surfaces in patient-care compartment that are not frequently touched can be cleaned with detergent and water. Avoid large-surface cleaning methods that produce mists or aerosols or disperse dust in patient-care areas.

- Clean any small spills of bodily fluids by cleaning first with detergent and water followed by disinfection.

- Large spills of bodily fluids should first be managed by removing visible organic matter with absorbent material. The spills should then be cleaned and disinfected as above.

Final Considerations for Ambulance Cleaning

- Place contaminated reusable patient care devices and equipment in biohazard bags clearly marked for cleaning and disinfection or sterilization as appropriate.
- Clean and disinfect or sterilize reusable devices and equipment according to manufacturer's recommendations.
- After cleaning, remove and dispose of gloves as instructed in a leak proof bag.
- Immediately clean hands with soap and water or an alcohol-based hand gel. Avoid touching the face with gloved or unwashed hands.

Respiratory Protection for EMS Personnel

Respiratory Protection for EMS

- Background on transmission of 2009 H1N1 Influenza
- Masks for patients
- N-95 respirators
- Special considerations for conserving N-95 supplies
- Priority Respirator Use
- Post-exposure Considerations

Background: How is 2009 H1N1 Influenza Transmitted?

- 2009 H1N1 influenza virus appears to be transmitted from person to person through close contact in ways similar to other influenza viruses. Although the relative contribution of each mode is uncertain, influenza virus can potentially be transmitted through:
  - Droplet exposure
  - Direct contact
  - Small particle aerosol

How is 2009 H1N1 Influenza Transmitted?

- Droplet exposure of mucosal surfaces (e.g., nose, mouth, and eyes) by respiratory secretions from coughing or sneezing;

- Contact, usually of hands, with an infectious patient or fomite (a surface that is contaminated with secretions) followed by self-inoculation of virus onto mucosal surfaces such as those of the nose, mouth, and eyes;

- Small particle aerosols in the vicinity of the infectious individual.

Transmission of Influenza Beyond 6 Feet?

- Transmission of influenza through the air over longer distances, such as from one patient room to another, is thought not to occur.
- All respiratory secretions and bodily fluids, including diarrheal stools, of patients with 2009 H1N1 influenza are considered to be potentially infectious.
- The key area of potential exposure is within 6 feet of the patient and/or being in a small enclosed airspace with the patient (e.g., small room or ambulance patient compartment).

Masks for Patients

- Any patient with an Acute Febrile Respiratory Illness should be masked whenever possible ,as tolerated

- Options for masking patients:
  - Medical (surgical) facemask
    - With or without nasal cannula oxygen as clinically indicated
  - Simple oxygen face mask
  - Non-rebreather oxygen face mask

- N-95 respirators should NOT be used on patients!
  - N-95 respirators significantly increase the work of breathing and may be dangerous to patients

N-95 Respirators and EMS

- CDC continues to recommend the use of respiratory protection that is at least as protective as a fit-tested disposable N95 respirator for healthcare personnel who are in close contact with patients with suspected or confirmed 2009 H1N1 influenza.

- This recommendation applies uniquely to the special circumstances of the current 2009 H1N1 pandemic during the fall and winter of 2009-2010 and CDC will continue to revisit its guidance as new information becomes available, within this season if necessary

Basis for N-95 Use for 2009 H1N1 Influenza

- The current recommendation is based on the unique conditions associated with the current pandemic, including
  - low levels of population immunity to 2009 H1N1 influenza
  - availability of vaccination programs well after the start of the pandemic
  - susceptibility to infection of those in the age range of healthcare personnel
  - increased risk for complications of influenza in some healthcare personnel (e.g., pregnant women)
  - the potential for healthcare personnel to be exposed to 2009 H1N1 influenza patients because of their occupation.

High Risk Aerosol Generating Procedures

- While N-95 respirators are recommended for all EMS personnel with close contacts to suspected H1N1, those involved in aerosol generating procedures are at highest risk and should definitely wear N-95s
- Example of EMS Aerosol Generating Procedures:
  - Performing or assisting in intubation or advanced airway insertion
  - Cardiopulmonary resuscitation (CPR)
  - Open suctioning of airways
- Note: Nebulized medication administration is not currently considered a high risk procedure

Proper N-95 Respirator Use

- For N-95 respirators to be used properly they should be properly fit tested to the wearer
  - Fit testing needs to occur for each type of N-95 respirator that may be worn
- Personnel with beards (and possibly other facial hair) can not safely wear an N-95
- Follow agency or manufacture instructions for donning and properly wearing an N-95 respirator
- Perform proper hand hygiene before and after donning the N-95 respirator
- Note: Wearing an N-95 increases the work of breathing considerably and will contribute to fatigue

When to Don the N-95 Respirator

- An N-95 respirator should be donned by the EMS worker(s) that has direct, close contact with the suspected H1N1 patient (e.g., within 6 feet or in the same small room)
- Perform universal screening for Acute Febrile Respiratory Illness with initial patient contact.
- Suspect H1N1 in all Acute Febrile Respiratory Illnesses
  - Fever *and*
  - Cough or sore throat
- Use dispatch information for advanced notice of need for N-95 respirator

When Not to Don an N-95

- The use of an N-95 respirator is intended for close contact to suspected H1N1 influenza patients and other airborne diseases (e.g., TB).
- N-95 respirators are not considered part of "Standard (or universal) Precautions".
- Routine EMS encounters with patients not experiencing signs and symptoms of an Acute Febrile Respiratory Illness should be treated using standard precautions unless other concerns (e.g., TB) are present.

Special Considerations for Conserving N-95 Respirator Supplies

- Because of the current 2009 H1N1 Influenza pandemic, supplies of N-95 respirators are in limited supply in many areas.
  - It is also unclear how long the H1N1 Influenza pandemic may last
- EMS agencies may need to implement special policies to limit consumption of N-95 respirators.
  - While single use with immediate disposal of the N-95 respirator is ideal, with simple precautions extended use and re-use of N-95 respirators can occur.

Extended Use of N-95 Respirators

- Extended use refers to wearing disposable N95 respirators for serial patient encounters, where the respirator has not been removed and re-donned between encounters.
- This practice may result in a risk of contact transmission by touching a contaminated surface of the respirator and subsequently touching the mucous membranes of the face.
  - The risk will be minimized if healthcare personnel perform hand hygiene every time before and after touching the respirator.
- This practice would not typically be appropriate for EMS personnel as there is usually significant time between individual patient encounters.
  - It may be seen in emergency department triage areas where triage staff may wear a single N-95 respirator over multiple patient encounters.

Re-Use of N-95 Respirators

- Re-use of disposable N95 respirators involves the respirator being removed and re-donned between patient encounters.
- This practice can result in a risk of contact transmission by touching a contaminated surface of the respirator and subsequently touching the mucous membranes of the face.
  - The risk will be minimized if healthcare personnel perform hand hygiene every time before and after touching the respirator.
- This practice would be most appropriate for EMS personnel that have episodic contact with patients that have suspected or confirmed H1N1 during the course of their work period.

Important Practices for N-95 Respirator Re-Use

- Discard disposable N95 respirators following aerosol-generating procedures. The administration of nebulized medication is not currently considered a high risk aerosol generating procedure.

- Discard disposable N95 respirators contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.

- Disposable respirators must only be used and re-used by a single wearer.

More Important Practices for N-95 Respirator Re-Use

- Do not re-use a disposable respirator that is obviously contaminated, damaged or hard to breathe through.
- Consider use of a face shield over a disposable N95 respirator to prevent surface contamination.
- Store the respirator in a clean, breathable container such as a paper bag between uses.

More Important Practices for N-95 Respirator Re-Use

- Avoid touching the inside of the respirator.
- Wearer should perform hand hygiene with soap and water or an alcohol-based hand sanitizer before and after touching a used respirator.
- When sufficient quantities exist, the respirator should be disposed of at the end of the work shift, especially if large numbers of patient encounters.
- If re-use during multiple work shifts is deemed necessary by the EMS agency, the N-95 respirator should be stored as described above and protected from physical damage and replaced when indicated.

Post Exposure Considerations

- EMS personnel who have had a recognized, unprotected close contact exposure to a person with confirmed, probable, or suspected 2009 H1N1 or seasonal influenza during that person's infectious period are at higher risk for becoming infected.
- EMS personnel with such an exposure should contact their supervisor for referral to the agency occupational medicine provider.
- Post-Exposure Options
  - Personnel may be counseled on early signs of influenza and advised to contact their medical provider immediately upon development of symptoms
  - Alternatively, personnel (particularly those at highest risk) may be considered for prophylactic antiviral medication

Summary

Vaccinations and EMS Personnel

- EMS personnel should receive both the 2009 H1N1 Influenza and the seasonal influenza vaccines.
- Both vaccinations are safe.
- Being vaccinated against flu protects
  - You, your patient, your friends and family, the public

Influenza Protective Measures

- Proper hand hygiene is essential
- Universally screen for Acute Febrile Respiratory Illness
- Minimize number of personnel exposed to suspected influenza patients
  - Fewest number of personnel within 6 feet of patient
  - Fewest number of personnel needed in patient care compartment of ambulance
- Maximal use of ambulance ventilation system
- Properly clean and disinfect ambulances after transport of suspected influenza patients

Respiratory Protection for H1N1

- The CDC continues to recommend a fit-tested N-95 respirator be worn for all close encounter s with suspected H1N1 influenza patients.
- Conservation of N-95 Respirators
  - Re-use of N-95 respirators may be appropriate
  - Proper hand hygiene before and after handling N-95
  - Replace respirators that are visibly contaminated, damaged, hard to breath through, or used in high risk aerosol generating procedures

Priority Respirator Use

- Indicated when fit-tested N-95 respirators are in very low supply
- Fit-tested N-95's provided to personnel at higher risk for exposure / complications
  - Personnel performing high risk aerosol generating procedures such as intubation and suctioning should always have a fit-tested N-95 respirator.
  - Alternatives for personnel at lower risk
    - A non-fit tested N-95 respirator properly worn (preferred)
    - A medical (surgical) facemask

For More Information Go To

- Centers for Disease Control and Prevention
  - www.flu.gov
  - www.cdc.gov/h1n1

- Michigan Department of Community Health
  - www.michigan.gov/flu