

## Influenza and Pneumococcal Polysaccharide Vaccinations and Institutional Protocols:

### Presentation for Home Health

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## Pneumococcal Disease

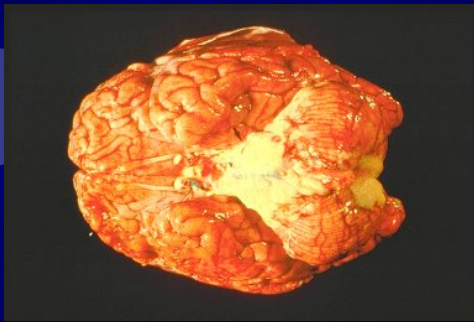
Upper respiratory tract infections

**Invasive disease:**  
bacteremia, meningitis,  
or in normally sterile site

**Pneumonia**

Modified from CDC

## Pneumococcal Meningitis



## Pneumococcal Meningitis

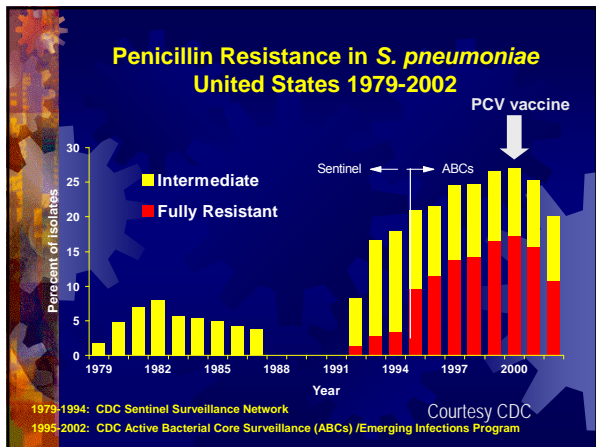
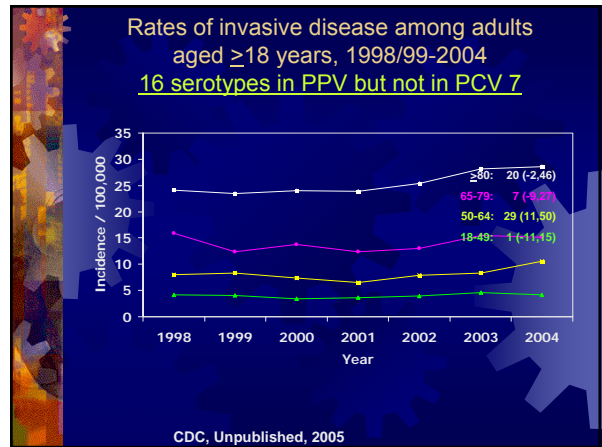
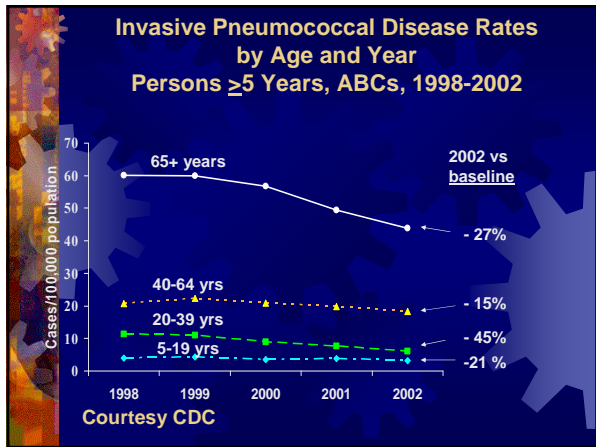
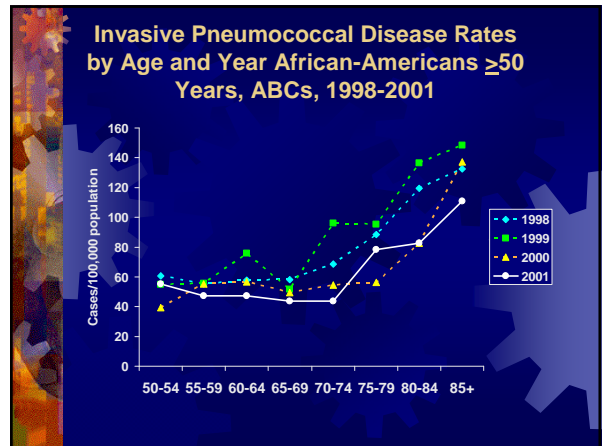
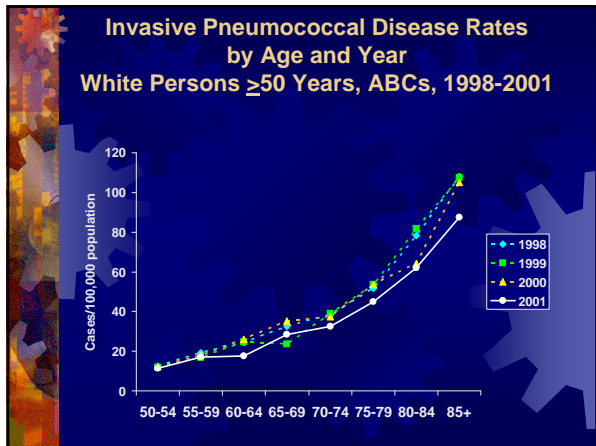
- Estimated 3,000 - 6,000 cases per year in the United States
- Case-fatality rate ~30%, up to 80% in the elderly
- Neurologic sequelae common among survivors

## Pneumococcal Bacteremia

- More than 50,000 cases per year in the United States
- Rates higher among elderly and very young infants
- Case-fatality rate ~20%; up to 60% among the elderly

## Pneumococcal Disease Outbreaks

- Outbreaks not common
- Generally occur in crowded environments (jails, nursing homes)
- Persons with invasive disease often have underlying illness
- May have high fatality rate



### Pneumococcal Polysaccharide Vaccine

- Purified pneumococcal polysaccharide (23 types)
- Account for 88% of bacteremic pneumococcal disease
- Not effective in children  $< 2$  years
- 60%-70% against invasive disease
- Less effective in preventing pneumococcal pneumonia

Courtesy CDC

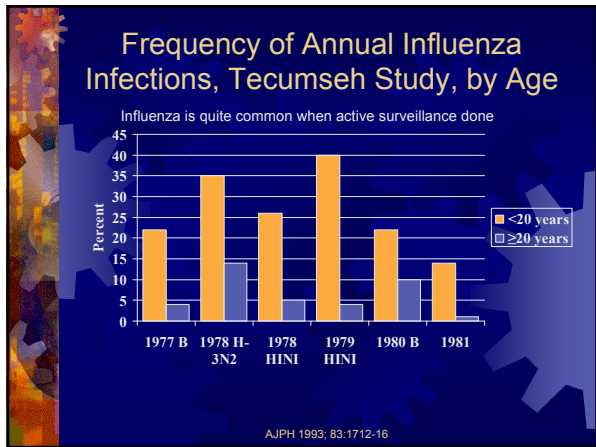
## Pneumococcal Vaccines Adverse Reactions

- ★ Local reactions
  - polysaccharide 30%-50%
  - conjugate 10%-20%
- ★ Fever, myalgia
  - polysaccharide <1%
  - conjugate 15%-24%
- ★ Severe adverse reactions rare

Courtesy CDC

## Pneumococcal Vaccines Contraindications and Precautions

- ★ Severe allergic reaction to vaccine component or following prior dose of vaccine
- ★ Moderate or severe acute illness



72% attack rate in exposed persons  
in a 4.5 hour plane flight

Communicability is highest 1-2 days  
before symptoms to 4-5 days after onset

### Influenza Outbreak in a Hospital Unit

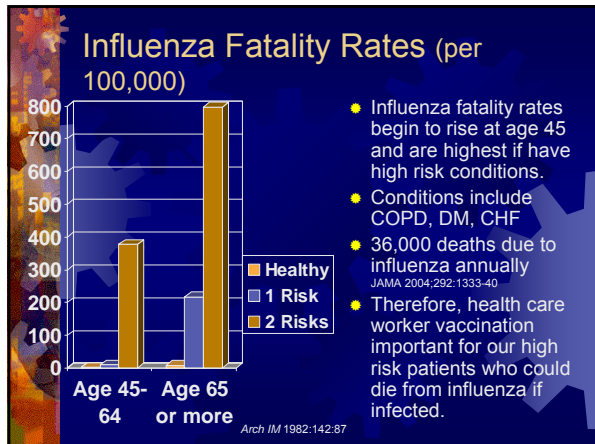
A patient infected roommates & health care workers (HCWs) who in turn spread it to others

Total of 15/29 patients & 15/33 HCWs infected

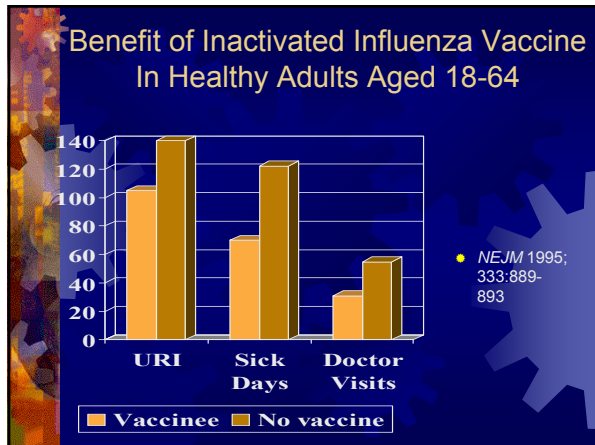
J Clin Invest 38:199-212

## Risk in Health Care Settings

- ★ Many HCW work while sick, thus exposing patients and colleagues
- ★ In one season, one quarter (23%) of HCWs had serologic evidence of influenza infection
- ★ However, most (59%) could not recall being sick, suggesting asymptomatic influenza
- ★ JAMA 1999;281:908-13

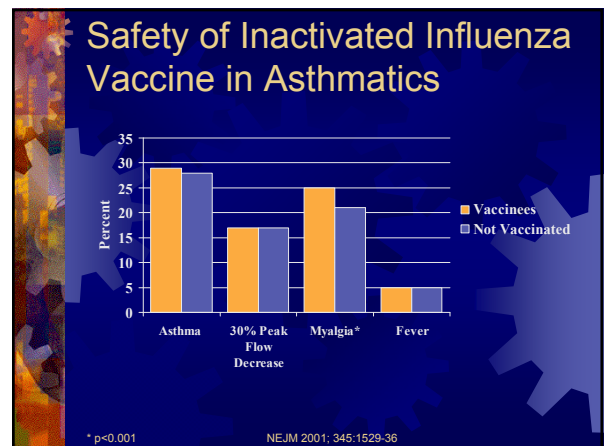


- ### Vaccine Types
- Inactivated – subvirion or purified surface antigen preparations
    - Older whole cell inactivated product off the market; it had higher reaction rates
    - When vaccine and circulating strains are well matched, efficacy is 70%-90% in healthy persons <65 years of age
    - Among older persons not in nursing homes, influenza vaccine 30%-70% effective in preventing hospitalization
    - In nursing homes, vaccines 50%-60% effective in preventing hospitalizations and 80% effective in preventing influenza-related death
  - Live Attenuated Influenza Vaccine



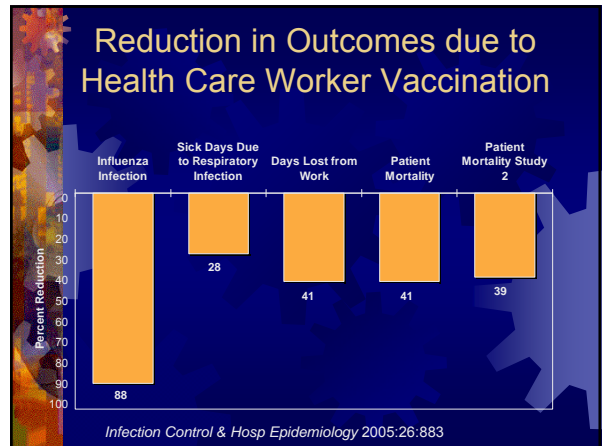
- ### Inactivated Influenza Vaccine Reactions
- Inactivated vaccine cannot cause true influenza as does not contain live virus
  - Currently, only split virion/purified products are produced; older more reactive products no longer on the US market
  - Serious adverse events are rare: e.g., anaphylaxis in those severely allergic to eggs

- ### Safety of Inactivated Influenza Vaccine
- One placebo controlled trial in the elderly found:
    - only difference was that 20% of vaccinees compared to 5% of placebo recipients had a sore arm ( $P < .001$ )
    - No other significant differences  
*JAMA 1990;264:1140*
  - A multi center, randomized, double blind, placebo-controlled cross-over trial in 2032 asthmatics
    - No change in respiratory function (See next slide)



## Contraindications: Inactivated Influenza Vaccine

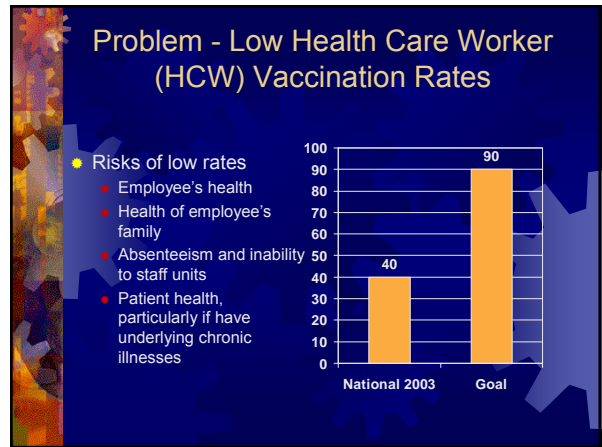
- Severe allergy to eggs (cannot eat eggs)
- Severe allergy to any vaccine component or a prior dose
- Acute, moderate-to-severe febrile illness (delay)



## Influenza Vaccination of Health Care Workers is a Major Patient Safety Issue

- Two trials in long-term care facilities found HCW vaccination decreased patient fatalities  
*Lancet 2000;355:93-7, JID 1997;175:1-6*
- CDC, Advisory Committee on Immunization Practices, & Hospital Infection Control Practices Advisory Committee state HCW vaccination is a measure of **patient safety**  
*MMWR 2008;55(RR-2):2*
- Ethical imperative "First do no harm: ensuring that health care workers vaccinate and are vaccinated."  
*Infection Control and Hospital Epidemiology 2003;24:799-800*
- Influenza vaccination of HCWs is called "The Next Battleground for Patient Safety"  
*Infection Control and Hospital Epidemiology 2005;26:850-1*

Applies to Home Health as Well!



## Call to Action for Influenza Vaccination of Health Care Workers

- American College of Physicians
- American Academy of Family Physicians
- American Academy of Pediatrics
- American College of Occupational and Environmental Medicine
- American Hospital Association
- American Medical Association
- American Nurses Association
- American Society of Health-System Pharmacists
- National Medical Association
- Centers for Disease Control and Prevention
- Association for Professionals in Infection Control and Epidemiology, Inc.
- Joint Commission on Accreditation of Healthcare Organizations

## Reasons for HCW Influenza Vaccination

- Protect oneself
- Protect one's family and friends
- Keep absenteeism low during outbreaks so enough staffing to help the sick
- Protect patients
- Keep the ethical code of "do no harm"

### Inactivated Influenza Vaccine Recommendations

- All persons 50 years of age or older
- Children 6-59 months of age
- Residents of long-term care facilities
- Pregnant women
- Persons 6 months to 18 years receiving chronic aspirin therapy
- Persons  $\geq 6$  months of age with chronic illness

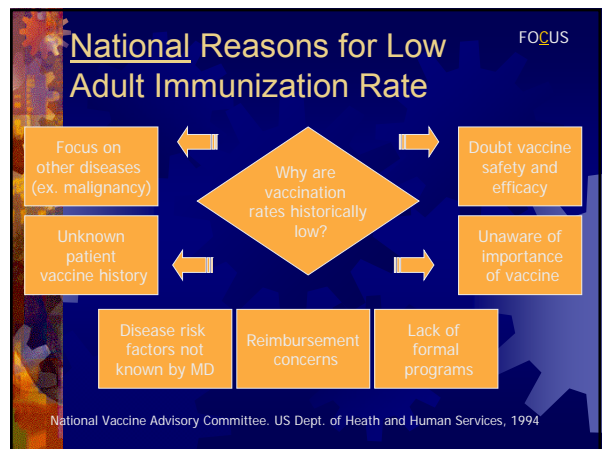
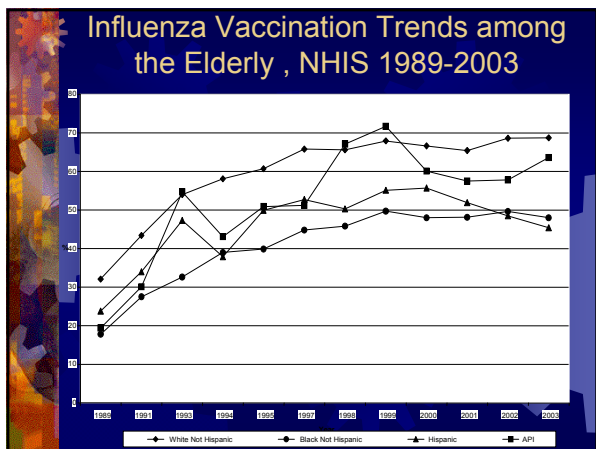
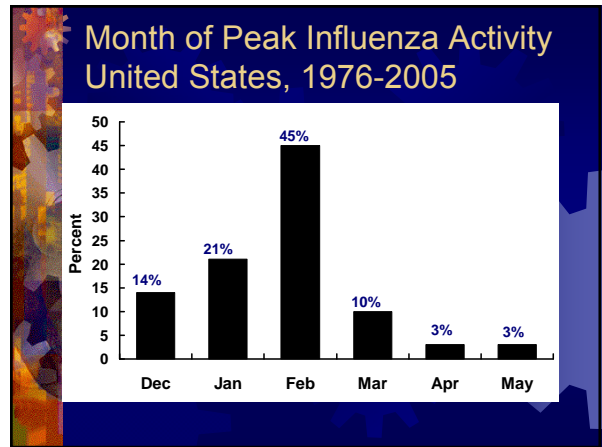
### Inactivated Influenza Vaccine Recommendations

- Persons with the following chronic illnesses:
  - pulmonary (e.g., asthma, COPD)
  - cardiovascular (e.g., CHF)
  - metabolic (e.g., diabetes)
  - renal dysfunction
  - hemoglobinopathy
  - immunosuppression, including HIV infection
  - any condition that can compromise respiratory function or the handling of respiratory secretions including seizures

### Influenza Vaccine Recommendations

- Healthcare providers, including home care
- Employees of long-term care facilities
- Household contacts of high-risk persons

\*LAIV should not be administered to healthcare workers who have contact with severely immunosuppressed persons who require hospitalization and care in a protective environment



## What affects influenza vaccination rates among older patients? An analysis from inner-city, suburban, rural, and Veterans Affairs practices

*Am J Med* 2003;114:31-8

Richard Kent Zimmerman  
 Tammy A. Santibanez  
 Janine E. Janosky  
 Michael J. Fine  
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 Stephen A. Wilson  
 Inis Jane Bardella  
 Anne R. Medsger  
 Mary Patricia Nowalk

## Variables significantly associated with receipt of the influenza vaccine

- Type of practice
- Marital status
- Knowledge that Medicare covers vaccination cost
- Awareness of the recommendation that persons aged  $\geq 65$  years should get influenza vaccinations every year
- Willingness to get both influenza and pneumonia vaccinations at the same doctor visit
- Belief that getting vaccinated is a wise thing to do
- Belief that their doctor recommends influenza vaccination
- Belief that a person who does not get vaccinated will probably get influenza

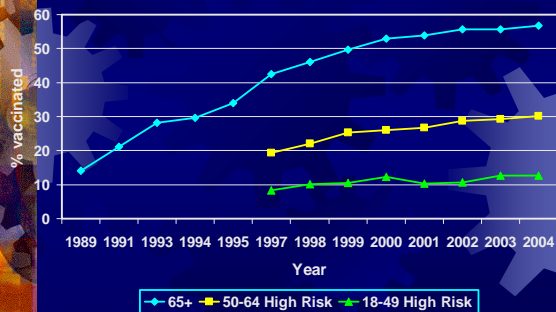
## Pneumococcal Polysaccharide Vaccine (PPV): ACIP Recommendations

- Adults  $\geq 65$  years of age
- Persons  $\geq 2$  years with
  - chronic illness (e.g. DM, CHF, COPD, renal failure, liver disease)
  - anatomic or functional asplenia
  - immunocompromised (malignancies, HIV, chemotherapy, high dose steroids)
  - Cochlear implants
  - environments or settings with increased risk (Alaskan Native, Native American)

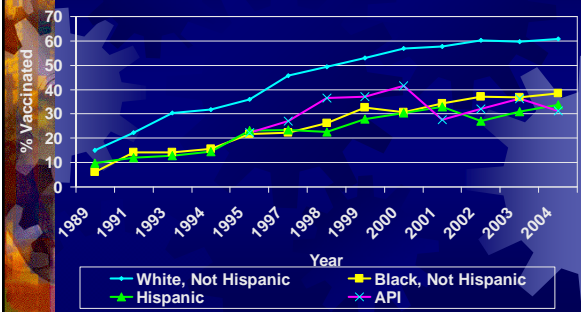
## ACIP/US Recommendations: Candidates for PPV Single Revaccination

- Persons  $\geq 2$  years of age with:
  - functional or anatomic asplenia
  - immunosuppression
  - transplant
  - chronic renal failure
  - nephrotic syndrome
- Persons vaccinated at  $< 65$  years of age

Self-reported pneumococcal vaccination coverage trends 1989-2004 among adults by age/risk group, US, NHIS



Self-reported pneumococcal vaccination coverage trends 1989-2004 among adults by race/ethnicity, US, NHIS



## Pneumococcal Polysaccharide Vaccine Missed Opportunities

- >65% of patients with severe pneumococcal disease had been hospitalized within preceding 3-5 years yet few had received vaccine
- May be administered simultaneously with influenza vaccine

## Previous Hospitalization as a Risk Factor for Pneumonia

- In the Oxford Record Linkage Study, 793 persons hospitalized or died due to pneumonia
- 36% of survivors had been hospitalized within previous 5 years
  - 46% among persons  $\geq 65$
- 49% of fatalities had been hospitalized within previous 5 years
- Therefore, influenza and PPV keys to preventing hospitalizations

## Barriers and facilitators of pneumococcal vaccination among the elderly

Vaccine 2003;21:1510-7

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## Predictors of pneumococcal vaccination status

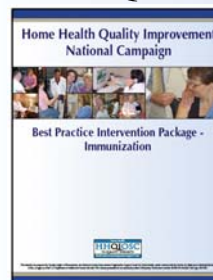
- Predictors of ever receiving PPV:
  - Anyone in the patient's doctor's office recommending they receive the shot
  - Belief that their doctor thinks they should get the shot
  - Feeling that getting the pneumonia shot is a wise thing to do
  - Receipt of the influenza vaccine in the most recent vaccination season
- Most common explanations for not being vaccinated:
  - Their doctor did not recommend a pneumonia shot
  - They did not know they needed the shot
  - They do not think they are likely to get pneumonia

## US Task Force on Community Preventive Services

- Systematic Evidence Review for Adult Immunizations
- Strongly Recommended Strategies and median improvement in %:
  - Client reminder/recall – 8%
  - Multicomponent including education – 16%
  - Reducing out-of-pocket costs – (influenza) – 10%
  - Multicomponent expanding access in health-care settings – (influenza) – 13%
  - Provider reminder/recall - 17%
  - Feedback to providers - 16%
  - Standing orders for adults - 28%

<http://www.thecommunityguide.org/vaccine/>

## HHQI Immunization BPIP



- Education and Awareness related to Influenza & Pneumonia Immunizations
- Tools and resources
- Free continuing education hours
- [www.homehealthquality.org](http://www.homehealthquality.org)

