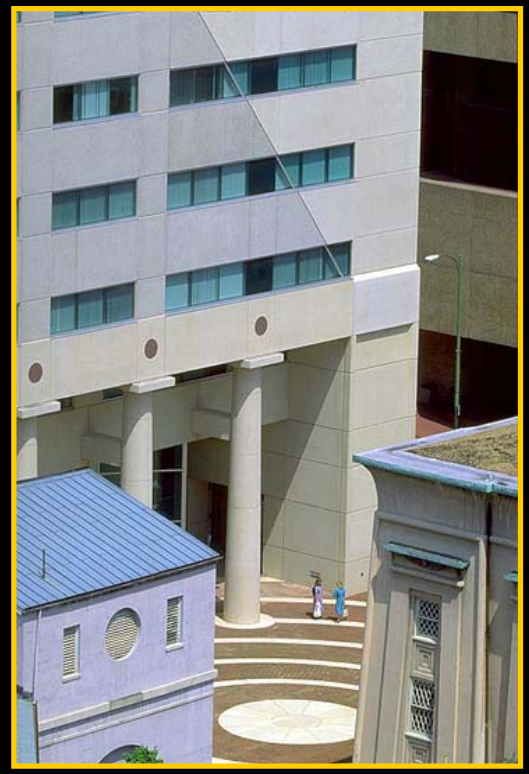
Pneumococcal & Influenza Vaccine Administration for Hospitalized Patients



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Leading Health Indicators

- Physical activity
- Overweight & obesity
- Tobacco use
- Substance abuse
- Responsible sexual behavior
- Mental health
- Injury & violence
- Environmental quality
- **Immunization**
- Access to health care

Increase the proportion of noninstitutionalized adults vaccinated annually against influenza & ever vaccinated against pneumococcal disease

CDC. Healthy People 2010.

Pneumococcal & Influenza Vaccine Administration:
Rationale

- These vaccines are effective
- Administration of these vaccines is covered by Medicare

National CAP Guidelines

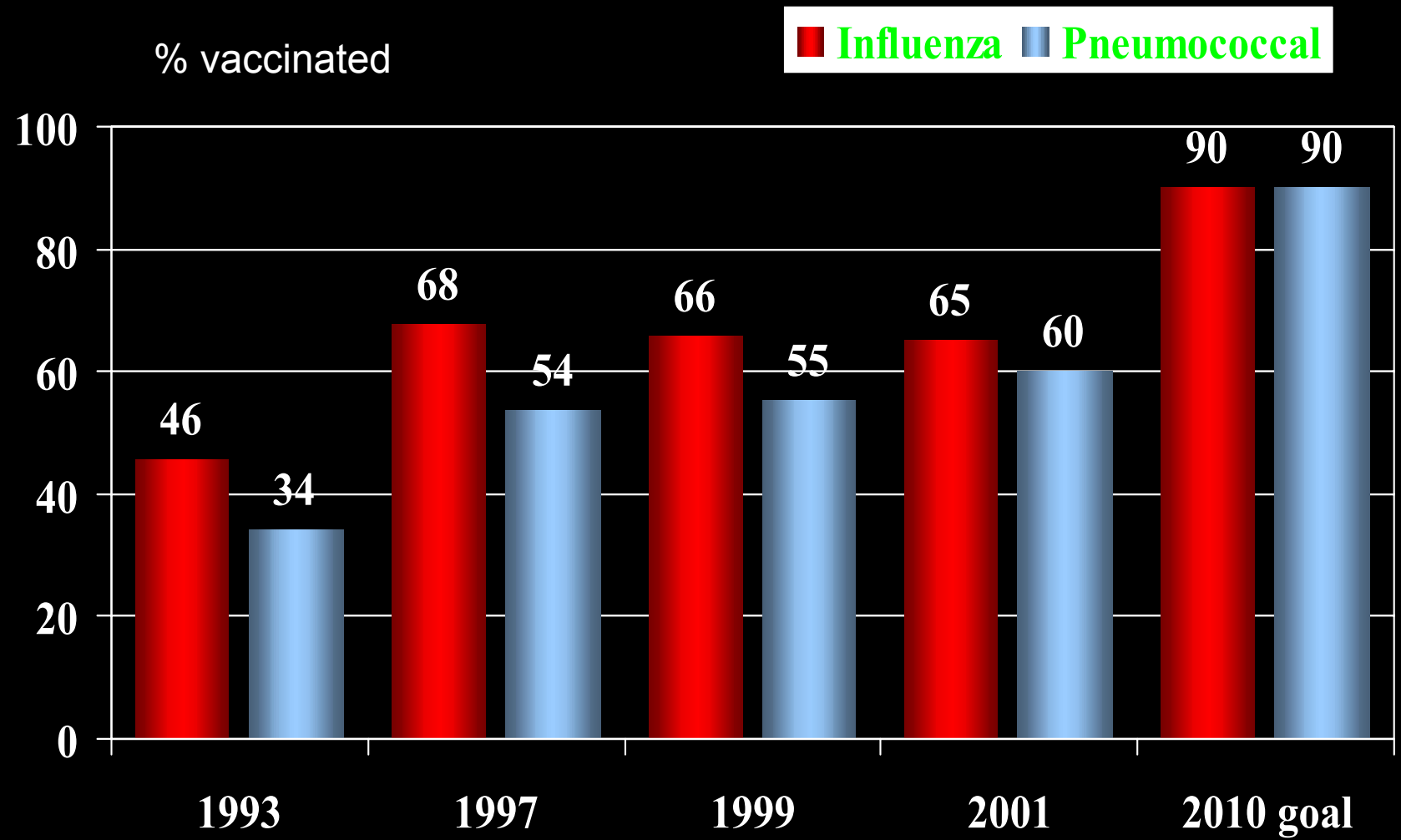
- Influenza & pneumococcal vaccines should be administered
  - Infectious Diseases Society of America, 2000
    - There is no contraindication for use of either pneumococcal or influenza vaccine immediately after an episode of pneumonia (i.e., before hospital discharge). The vaccines are inexpensive and can be given simultaneously.
    - IDSA 2003
      - **C III Recommendation** for Vaccination prior to hospital discharge
  - American Thoracic Society, 2001
  - Advisory Committee on Influenza Practices (ACIP)

Pneumococcal & Influenza Vaccine Administration: Process Indicators

- Increase the number of inpatients screened for influenza & pneumococcal immunization status & vaccinated prior to discharge, if indicated
- Increase state wide immunization rates for influenza & pneumococcal vaccines

Vaccine Utilization in Virginia

Adults ≥65 years old



CDC. Behavioral Risk Factor Surveillance System

Influenza

- Very common community-acquired infection
- Accounts for 20,000 deaths/year in the US
- Persons $\geq$65 years old have increased morbidity & mortality

Influenza Vaccine

- Made from egg-grown viruses; inactivated (not a live virus vaccine)
- Contains antigens from 2 A viruses & 1 B virus that are likely to circulate in the upcoming winter
- Annual vaccination is necessary as immunity declines in the year following vaccination
- Should be administered in October-November
- Contraindications: egg allergy or allergy to vaccine components

Vaccine Misconceptions

The following are not vaccine contraindications:

- Previous mild-moderate local tenderness, redness/swelling, fever <40.5°C
- Mild acute illness with/without low-grade fever
- Current antimicrobial therapy or convalescence from a recent illness
- Pregnancy or household contact with a pregnant woman
- Recent exposure to an infectious disease
- Breast-feeding
- Family history of "allergies," adverse reactions to vaccination, or seizures

Influenza Vaccine Indications

- ≥50 years of age
- Any person wishing to reduce chance of infection
- Nursing home residents
- Chronic cardiopulmonary disorders
- Chronic metabolic disease (e.g., DM), renal dysfunction, hemoglobinopathies, immunosuppression
- Long-term aspirin therapy in children & teenagers

MMWR 2001;50(RR-4):8-12.

Influenza Vaccine Indications

- Household members of persons in high-risk groups
- HIV infection
- Women who will be in 2nd or 3rd trimester of pregnancy during influenza season
- Travelers
  - Persons at high risk for complications of influenza who were not vaccinated during the preceding fall-winter should consider receiving vaccine before travel if they plan to:
    - Travel to the topics
    - Travel w/ large organized tourists groups at any time of year
    - Travel to Southern hemisphere April - September
- HCWs (in/outpatient, nursing home, home care, EMS)

MMWR 2001;50(RR-4):8-12.

Efficacy of Influenza Vaccine

Determinants of efficacy:

- Closeness of match between circulating virus & vaccine strains
- Age
- Immunocompetence

Group	Outcome Prevented	Efficacy
<65 years, healthy	Illness due to influenza	70-90%
Elderly in nursing homes	Illness due to influenza	30-40%
	Hospitalization & pneumonia	50-60%
	Death	80%

MMWR 1998;47(RR-6):8.

Influenza Vaccine During Hospitalization

- One study revealed that 39-46% of patients hospitalized during the winter with influenza-related diagnoses had been hospitalized during the preceding autumn
  - *missed vaccination opportunity*
    - Fedson DS et al. Ann Intern Med 1992;116:550-555.
- Persons of all ages with high-risk conditions & those aged ≥50 years who are hospitalized during September to March should be offered & strongly encouraged to receive influenza vaccine before they are discharged

CDC. MMWR 2003; 52(RR08):1-36.

Pneumococcal Pneumonia

- *Streptococcus pneumoniae* is the most common cause of bacterial pneumonia in adults
- Bacteremia occurs in 20-30%
  - Mortality rate 16-44% in those ≥65 years

    Plotkin SA, Orenstein WA. Vaccines, 3rd ed. 1999.
  - May be complicated by shock, respiratory failure, empyema, meningitis, septic arthritis, purulent pericarditis, & endocarditis
- *S. pneumoniae* has become increasingly resistant to antibiotics

Impact of *S. pneumoniae*

- 500,000 cases of pneumonia/year
  - 100,000-135,000 hospitalizations
- 60,000 cases of invasive disease/year
  - 3,300 cases of meningitis
  - 50,000 cases of bacteremia
    - Mortality in those >65 years as high as 40%
- 40,000 deaths/year

http://www.cdc.gov/ncidod/dbmd/diseaseinfo/drugresisstreppneum_t.htm
Williams WW et al. Ann Intern Med 1988;108:616-25.
CDC. MMWR 2000;49(RR-01):15-26.

Pneumococcal Vaccine

- Covers 23 of the 90 serotypes of *S. pneumoniae*
  - These 23 serotypes account for 90% of invasive infections
- Not a live vaccine
- Administered once in those ≥65 years
  - Revaccination only for those vaccinated at <65 years & the immunosuppressed
- Can be administered simultaneously with influenza vaccine
- Overall, 60% effective
- Well tolerated; serious side effects rare
- Contraindication: severe reaction to previous pneumococcal vaccination

Cost Effectiveness of Pneumococcal & Influenza Vaccinations

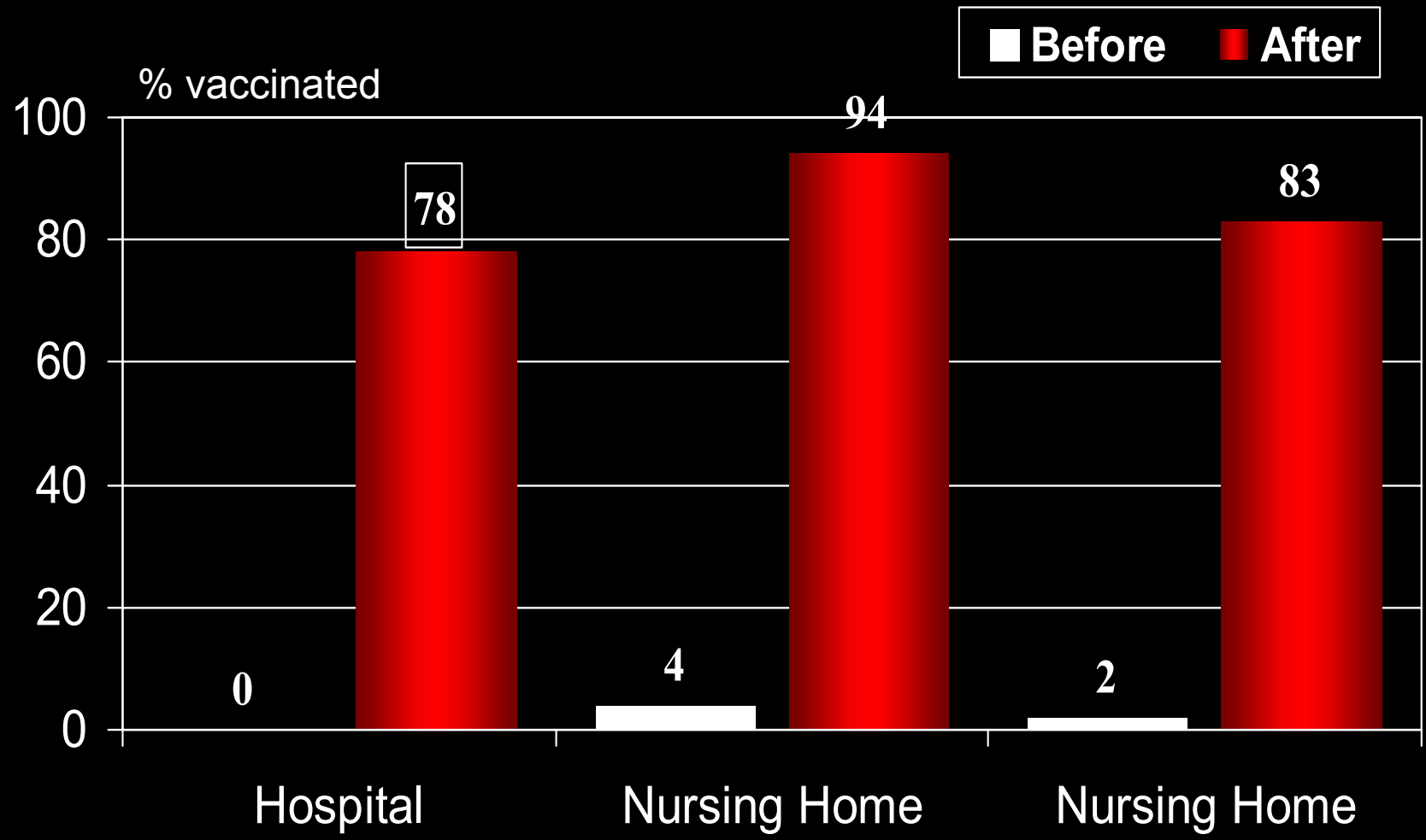
- For persons ≥60, these vaccines are more cost effective than:
  - Mammograms
  - PAP smears
  - Screening blood for HIV
  - B-blocker for survivors of MI
  - Cholesterol screening
  - Smoking cessation

Tengs TO et al. Risk Anal 1995;15:369-390.

Standing Orders

- A rule from the Centers for Medicare and Medicaid Services (CMS) in 2002 removed the physician signature requirement for the administration of influenza and pneumococcal vaccines to Medicare and Medicaid patients in hospitals, long-term care facilities, & home health agencies

Effect of Standing Orders on Pneumococcal Vaccination Rates



CDC. MMWR 2000;49(RR-01):15-26.

Conclusion

- Hospitalization may be an opportune moment to administer Influenza and Pneumococcal vaccines.
- Contraindications are few thus many patients should be eligible.
- Vaccine misconceptions may be a barrier to successful vaccination.
- Standing orders for vaccination has greatly improved rates of vaccination during hospitalization.