Vaccine preventable health associated infections (HAI)

Entesar Husain BM BCH, FRCPC

Assistant Professor, Department of Pediatrics
Faculty of Medicine
Consultant Pediatric Infectious Diseases
NBK Hospital
Kuwait

Ten Great Public Health Achievements in the 20th Century

Public health is credited with adding 25 years to the life expectancy of people in the United States in this century. Yet, ask the average person what public health is and their reply might be limited to: "healthcare for low-income families." CDC's Ten Great Public Health Achievements in the 20th Century was created to remind us of how far we've come, how we got here, and exactly what public health is: the active protection of our nation's health and safety, credible information to enhance health decisions, and partnerships with local minorities and organizations to promote good health.

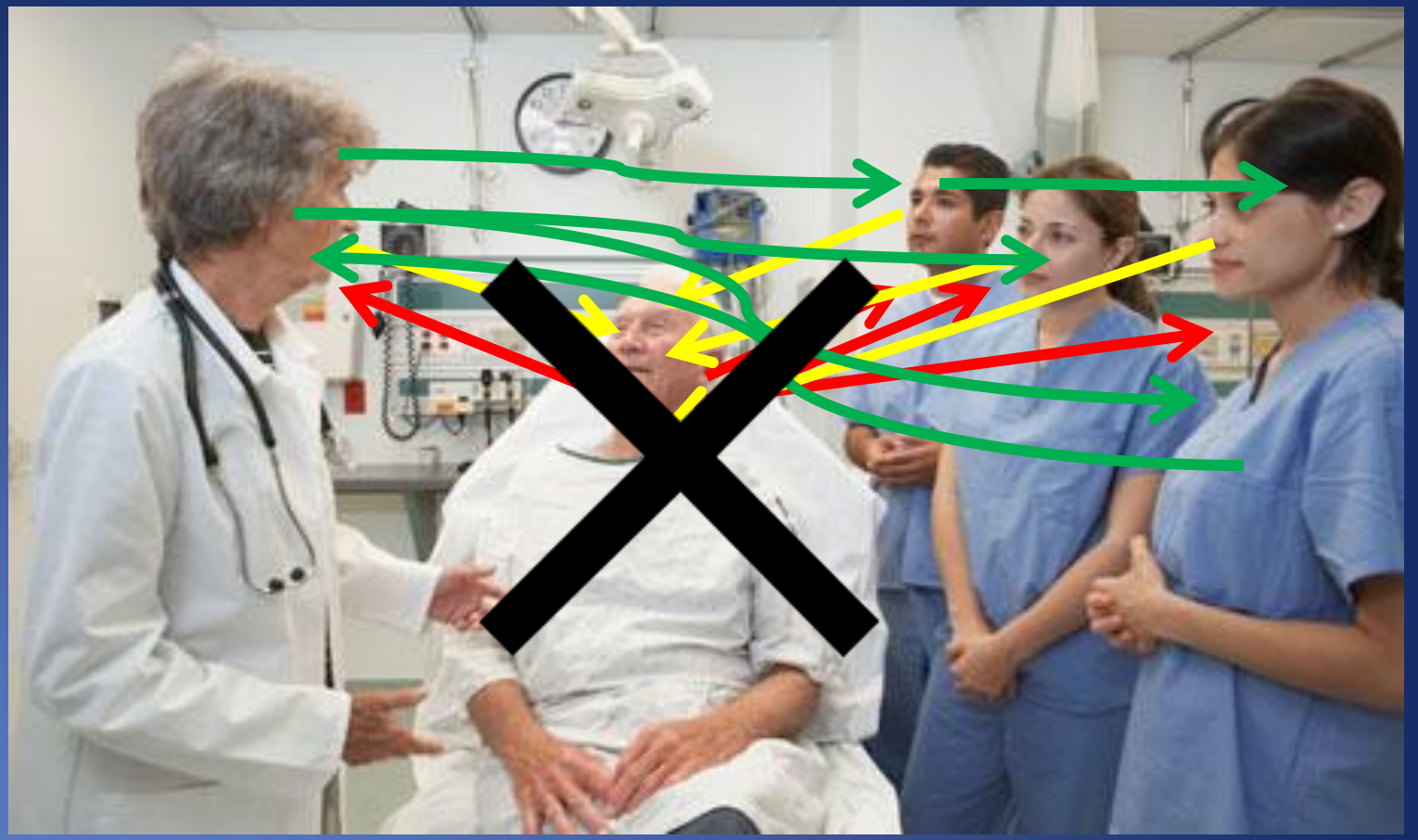
Learn more about how far we've come in the Morbidity and Mortality Weekly Report (MMWR):

Ten Great Public Health Achievements in the 20th Century

- Immunizations
- Motor-Vehicle Safety
- Workplace Safety
- Control of Infectious Diseases
- Declines in Deaths from Heart Disease and Stroke
- Safer and Healthier Foods
- Healthier Mothers and Babies

Why to vaccinate health care workers?

Vaccine of Healthcare Workers



Decker MD, et al. Hospital Epidemiology and Infection Control 3rd ed.

Vaccine of Healthcare Workers

- ***Protection of workers*** from risk of the work place
- ***Protection of patients*** from risks posed by infectious HCWs

Establishing and maintaining immunity is an essential component of both Occupational Health and Infection Prevention and Control programs

Decker MD, et al. Hospital Epidemiology and Infection Control 3rd ed.

Hospital Acquired infections

Hepatitis B

- Infections among persons in medical or dental field:
  - 1982: 10,000 infections.
  - 2004: 304 infections

- largely resulting from the implementation of routine pre-exposure vaccination and improved infection-control precautions

MMWR , 2011

Influenza

- A cross-sectional survey of hospital house staff
  - 37%: influenza-like illness during September–April
  - 9%: more than one respiratory illness.
  - Length of illness varied (range: 1–10 days; mean: 7 days)
  - Days of work missed (range: 0–10 days; mean: 0.7 days)
  - Infected HCP who continue to work while ill might transmit influenza to patients, many of whom are at increased risk for severe outcomes from influenza.

Lester RT. Infect Control Hosp Epidemiol 2003;24:839–44.

Nosocomial Pertussis Outbreak

- French general hospital
- November 17, 2000- March 31, 2001
- Index case transmitted pertussis to 15 healthcare + 2 immunosuppressed patients.

Bassinet L. Infect Control Hosp Epidemiol 2004;25:995-997).

Chickenpox outbreak

- 23 yr renal transplant , admitted to hospital in Jaipur ,India.
- Secondary cases : 6 nursing staff
- Tertiary cases: 7 nursing staff + 1 patient

Sood. Journal of Clinical and Diagnostic Research. 2013 Oct, Vol-7(10): 2294-2295

HCW Immunization

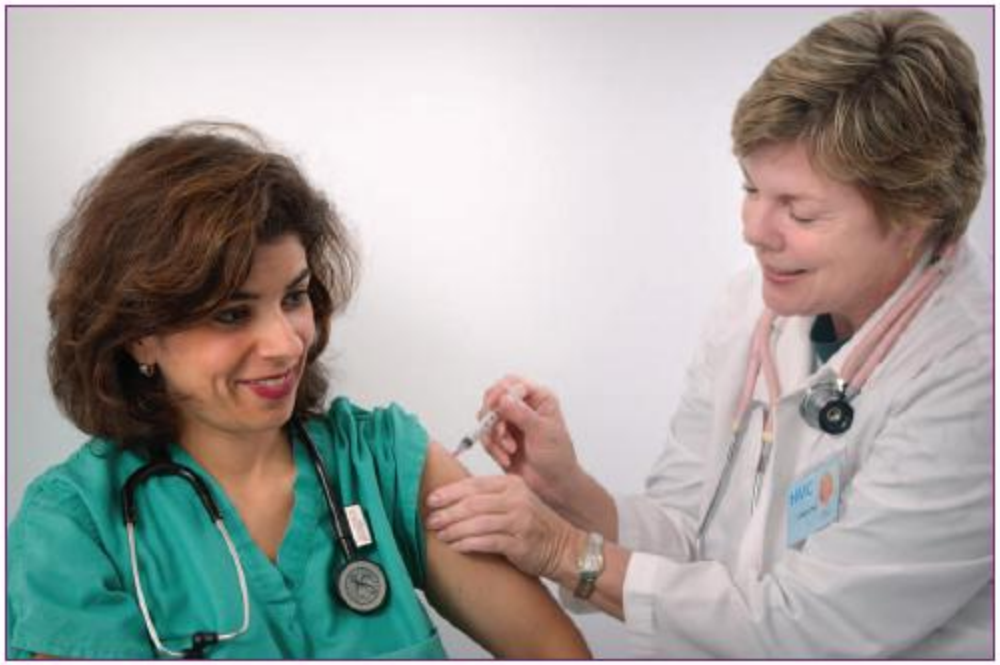
- Prevent transmission
- Prevent work restrictions after exposure
- Cost-effective compared to:
  - Absence
  - Treatment of cases
  - Outbreak control

What vaccinations ?

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Recommendations and Reports / Vol. 60 / No. 7
November 25, 2011

Immunization of Health-Care Personnel

Recommendations of the Advisory Committee on Immunization Practices (ACIP)



Diseases for which vaccination is recommended

Hepatitis B

- HCP and trainees in certain populations at high risk for chronic hepatitis B (e.g., those born in countries with high and intermediate endemicity) should be tested for HBsAg and anti-HBc/anti-HBs to determine infection status.

Influenza

- Emphasis that all HCP, not just those with direct patient care duties, should receive an annual influenza vaccination
- Comprehensive programs to increase vaccine coverage among HCP are needed; influenza vaccination rates among HCP within facilities should be measured and reported regularly.

Measles, mumps, and rubella (MMR)

- History of disease is no longer considered adequate presumptive evidence of measles or mumps immunity for HCP; laboratory confirmation of disease was added as acceptable presumptive evidence of immunity. History of disease has never been considered adequate evidence of immunity for rubella.
- The footnotes have been changed regarding the recommendations for personnel born before 1957 in routine and outbreak contexts. Specifically, guidance is provided for 2 doses of MMR for measles and mumps protection and 1 dose of MMR for rubella protection.

Pertussis

- HCP, regardless of age, should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap.
- The minimal interval was removed, and Tdap can now be administered regardless of interval since the last tetanus or diphtheria-containing vaccine.
- Hospitals and ambulatory-care facilities should provide Tdap for HCP and use approaches that maximize vaccination rates.

Varicella

Criteria for evidence of immunity to varicella were established. For HCP they include

- written documentation with 2 doses of vaccine,
- laboratory evidence of immunity or laboratory confirmation of disease,
- diagnosis of history of varicella disease by health-care provider, or diagnosis of history of herpes zoster by health-care provider.

Meningococcal

- HCP with anatomic or functional asplenia or persistent complement component deficiencies should now receive a 2-dose series of meningococcal conjugate vaccine. HCP with HIV infection who are vaccinated should also receive a 2 dose series.
- Those HCP who remain in groups at high risk are recommended to be revaccinated every 5 years.

Abbreviations: HBsAg = Hepatitis B surface antigen; anti-HBc = hepatitis B core antibody; anti-HBs = hepatitis B surface antibody; Tdap = tetanus toxoid, reduced diptheria toxoid and acellular pertussis vaccine; HIV = human immunodeficiency virus.

* Updated recommendations made since publication of the 1997 summary of recommendations (CDC Immunization of health-care workers: recommendations of the Advisory Committee on Immunization Practices [ACIP] and the Hospital Infection Control Practices Advisory Committee [HICPAC]. MMWR 1997;46[No. RR-18]).

Diseases for Which vaccination might be indicated in certain circumstances

- Meningococcal disease
- Typhoid
- Polio

Hepatitis B vaccine

- Primary series: 3 dose
- Post-vaccination serologic testing (anti-HBs):
  - HCP at high risk for occupational percutaneous or mucosal exposure to blood or body fluids.
  - Performed 1–2 months after administration of the last dose of the vaccine series

anti-HBs (≥10 mIU/mL).

- Immune
- No need for further testing

anti-HBs (<10 mIU/mL).

- Second complete 3-dose series on an appropriate schedule
- Anti-HBs testing 1–2 months after the third dose

anti-HBs (<10 mIU/mL).

- Should be tested for HBsAg and anti-HBc to determine infection status.
- Nonresponders:
  - At risk of HBV infection
  - Counseled about precautions to prevent HBV infection and the need to obtain hepatitis B immune globulin (HBIG) postexposure prophylaxis for any known or likely exposure to HBsAg-positive blood

Influenza Vaccine

- Annual influenza vaccination is recommended for all HCP who have no contraindications .
- HCP should be among the groups considered for prioritized receipt of influenza vaccines when vaccine supply is limited.

Influenza vaccine

- Two types of influenza vaccines are available (Live attenuated influenza vaccine (LAIV) & Trivalent inactivate vaccine (TIV).

- LAIV not to be administered to HCP who care for immunocompromised hospitalized persons who require care in a protective environment.

Absenteeism of HCW

- Double blind, randomized, placebo controlled trial*
- 2 large teaching hospitals over 3 years
- Vaccinated vs. controls
  - Vaccinated group with lower incidence of influenza (1.7%) compared to controls (13.4%)
  - Estimated vaccine efficacy against serologically defined influenza A and influenza B infection of 88% and 89%
  - Trend toward
    - fewer total respiratory illnesses (28.7 per 100 persons) vs. controls (40.6 per 100 persons)
    - Fewer days of lost work (9.9 per 100 persons) vs. (21.1 per 100 persons) for controls

*Wilde JA, McMillan JA, Serwint J, Butta J, O'Riordan MA, Steinhoff MC. Effectiveness of influenza vaccine in health care professionals: a randomized trial. JAMA 1999;281:908--13.

Relationship of Staff Flu Vaccination coverage and nosocomial infection with influenza*

- Monitored for 12 years (‘87-99)
- Coverage rated increased from 4% to 67%
- Lab confirmed cases-staff
  - Dropped from 42% (1990-93) to 9% (1997-2000)
- Nosocomial cases among hospitalized patients
  - Decreased 32% to 0 ($p<0.0001$)

*Salgado CD, Giannetta ET, Hayden FG, Farr BM. Preventing nosocomial influenza by improving the vaccine acceptance rate of clinicians. Infect Control Hosp Epidemiol 2004;25:923--8.

MMR vaccine

- All persons who work in health-care facilities should have presumptive evidence of immunity to MMR.
- Presumptive evidence of immunity to MMR:
  - documentation of vaccination with 2 doses of MMR vaccine administered at least 28 days apart
  - laboratory evidence of immunity
  - laboratory confirmation of disease
  - birth before 1957

Pertussis vaccine

- Regardless of age, HCP should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap and regardless of the time since their most recent Td vaccination.
- Tdap is not licensed for multiple administrations; therefore, after receipt of Tdap, HCP should receive Td for future booster vaccination against tetanus and diphtheria.

Varicella vaccine

- Health-care institutions should ensure that all HCP have evidence of immunity to varicella. This information should be documented and readily available at the work location.
- HCP without evidence of immunity to varicella should receive 2 doses of varicella vaccine administered 4–8 weeks apart

HCW Immunization

- Applies to all health care settings
  - offices, clinics, acute care, laboratories, first responders, etc.
- Applies to all health care personnel
  - employees, physicians, students, contract workers, volunteers
  - student immunization should occur before clinical placement

Ten Great Public Health Achievements in the 20th Century

Public health is credited with adding 25 years to the life expectancy of people in the United States in this century. Yet, ask the average person what public health is and their reply might be limited to: "healthcare for low-income families." CDC's Ten Great Public Health Achievements in the 20th Century was created to remind us of how far we've come, how we got here, and exactly what public health is: the active protection of our nation's health and safety, credible information to enhance health decisions, and partnerships with local minorities and organizations to promote good health.

Learn more about how far we've come in the Morbidity and Mortality Weekly Report (MMWR):

Ten Great Public Health Achievements in the 20th Century

- Immunizations
- Motor-Vehicle Safety
- Workplace Safety
- Control of Infectious Diseases
- Declines in Deaths from Heart Disease and Stroke
- Safer and Healthier Foods
- Healthier Mothers and Babies

Healthcare-associated Infections (HAIs)

Healthcare-associated Infections
HAIs: The Burden
Monitoring HAIs
Types of Infections
Diseases and Organisms
Preventing HAIs
ACA Activities
Guidelines and Recommendations
Toolkits
Basic Infection Control and Prevention Plan for Outpatient Oncology Settings
Outpatient Care Guide
Map: HAI Prevention Activities
Research
Patient Safety
Outpatient Settings
Long-term Care Settin

Preventing Healthcare-associated Infections

Healthcare-associated infections (HAI) are a threat to patient safety. CDC provides national leadership in surveillance, outbreak investigations, laboratory research, and prevention of healthcare-associated infections. CDC uses knowledge gained through these activities to detect infections and develop new strategies to prevent healthcare-associated infections. Public health a… CDC and other healthcare partners has led to impro… clinical practice, medical procedures, and the o… of evidence-based infection control guidan… successes.

On this Page
- HS Action Plan
- patient Settings
- is Settings
- Term Care Settings
- Dental Settings
- Correctional and Detention Facilities
- HAI Recovery Act
- Protecting Healthcare Personnel
- Publications
- CDC Expert Commentary

HHS Action Plan to P… associated Infe…

The prevention … ociated infections is a top priori… ealth and Human Servic… mmittee for the Prevention of H… was established in July 2008, the … ith scientists and program officials … the *HHS Action Plan to Prevent Healthcare-…ns*, providing a roadmap for HAI prevention in acute care hospitals.

…ction Plan to Prevent HAIs: Ambulatory surgical centers

Vaccination of HCP

Thank you