

Objectives

- Describe in detail what immunizations are recommended for Healthcare workers and why.
- Discuss ways one can use immunizations in outbreak settings.
- \blacksquare Discuss a process to develop a mandatory influenza vaccination program and strategies for mass vaccination
- Discuss how Colorado was able to make influenza vaccination mandatory for all healthcare workers.

Definition of Healthcare Worker

- All paid and unpaid person working in health-care settings who have the potential for exposure to patients and/or infectious materials including:
 - Body substances
 - Contaminated medical supplies and equipmer environmental surfaces, or contaminated air.
- Might include (but not limited to):
- Physicians,nurses
- nursing assistants, therapists
- technicians emergency medical service personnel
- dental personnel,pharmacists, laboratory personnel,
- autopsy personnel,
- students and trainees,



Definition of Healthcare Worker

- Personnel not directly involved in patient care but potentially exposed to infectious agent that can be transmitted to and from health- care personnel and patients
- Clerical
- Dietary
- Housekeeping
- Laundry
- Security
- MaintenanceAdministrative
- AdminiBilling
- Volunteers



⁺ A Simple Immunization Schedule



Immunizations for HCWs



- Measles, Mumps, Rubella (MMR)
- Tetanus and diphtheria (toxoids) and acellular pertussis
- Varicella vaccine
- Quadrivalent meningococcal conjugate vaccine
- Influenza Vaccination

Serologic Testing

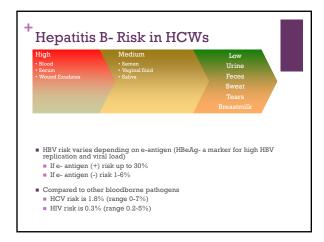
- \blacksquare Pre-vaccination antibody screening before immunization for an employee who does not have adequate presumptive evidence of immunity is not necessary unless the medical facility considers it cost effective.
- lacksquare If have evidence of adequate immunization ightarrow no serologic
- Incomplete or missing documentation → serologic testing

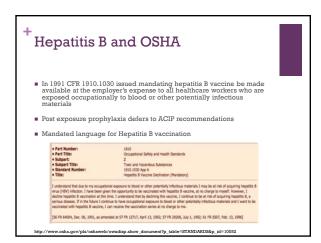
Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

Hepatitis B

- Why Hepatitis B?
- First recommended for HCWs in 1982 estimated 10,000 infections occurred among persons employed in a medical or dental field
- 2004-304 infections
- Risk of Hepatitis B
- Dependant on the frequency of percutaneous and mucosal exposures to blood or body fluids containing Hepatitis B virus (HBV).
- New trainees

Centers for Disease Control and Prevention, Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

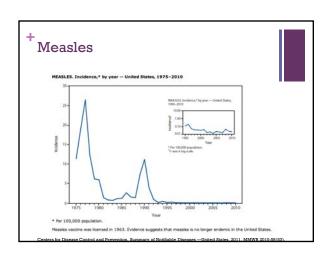




+ Hepatitis B Primary Schedule 2 doses 4 weeks apart; 3rd dose 5 months after second. Vaccine schedule does not have to be restarted if the second or third dose is delayed. If serologic testing is done to determine response to vaccination-should be done 1-2 months after vaccination. Contraindications: Previous anaphylactic reaction to common baker's yeast. Hypersensitivity to vaccine component or previous reaction. Pregnancy is not a contraindication. Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

+ Hepatitis B –serology reminders					
Table 2					
Tests HBsAc	Results	Interpretation	Vaccinate?		
HBsAg ant-HBc ant-HBs	negative negative	susceptible	veccinate if indicated		
HBsAg anti-HBc anti-HBs	negative negative positive with <u>>10miUimL*</u>	immune due to veccination	no vaccination necessary		
HBsAg anti-HBs anti-HBs	negative positive positive	immune due to natural infection	no vaccination necessary		
HBsAg ant-HBc IgM ant-HBc ant-HBs	positive positive positive regative	acutely infected	no veccination necessary		
HBsAg anti-HBs IgM anti-HBc anti-HBs	positive positive negative negative	chronically infected	no vaccination necessary (may need treatment)		
HBsAg anti-HBs anti-HBs	negative positive negative	four interpretations possible†	use clinical judgment	1	
Publicationation testings, when it is recommended, should be performed 1-2 months after the last does of vectors. Infertis born to HBUAg-positive nothers should be tested for HBUAg and self-tills after completion of all health 3 does of a standed hepatite 8 welcontain series, at age 11-18 months (pervently at the ended of hid visit). When the recommendation mountain HBU infertion of the self-till description.					
	test may not be sensitive enough to deter	of a very low level of anti-HBs in serum			
May be susceptible with a false p		and the first control of			
May be chronically infected and have an undetectable level of HEMAD present in the serum Source: .immunize.org/askexperts/experts hepb.asp					

Vaccination and	n an occupational setting Treatment			
entibody response status of exposed sersons'	Source is	Source is	Source is unknown o	r not tested
	HBs/4g positive	HBsJkg negative	High risk	Lowrisk
Unwaccinated	HBROF (1 dose) and begin a lopastric B vaccine series	Begin a beputits B vaccine netes	Degin a bepetitis D vaccine series	Begin a bepatitis B vaccine retirs
Known responder*	No treatment	No bredment	No treatment	No tredment
Nonresponder*				
Not revectinated	HDEG (I dose) and begin a transcington under	Degia a ervaccination series	HERO (1 dose) and begin a revaccination series	Segia a resoccination series
After cavaccination	HBHO (2 down)*	No irostmest	H200 (2 does)*	No treatment
Antibody response unknown	Test for unit-PEDs* If adequate*, no treatment If sindequate, NEOG s. 1 and vaccine broater	No involvent	Test for anti-SEDs* If adoquate, 3 no test If inadoquate, give to check anti-SEDs in 3-	ocine booster and



*Measles and the Healthcare Setting

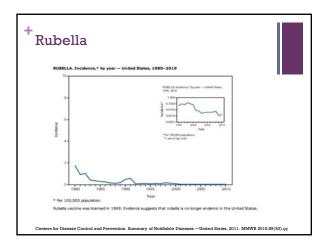
- During 2001-2008 a total of 12.5% (one of eight) of measles cases reported to CDC among HCWs occurred in persons born BEFORE 1957; the other seven cases occurred among HCWs born AFTER 1957.
- Medical settings were a primary site of measles transmission during the 1989-91 measles resurgence.
- Only 3 states have laws mandating that all hospital personnel have proof of measles immunity and did not allow for religious or philosophic exemptions
- New York
- Oklahoma
- Rhode Island

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

Mumps and the Healthcare Setting

- Tennessee mumps outbreak 1986-87: transmission to 6 HCWs
- Utah 1994, 2 HCWs developed mumps after contact with infected patient.
- 2006 multistate US outbreak: 144 (8.5%) of 1,705 adult casepatients in Iowa for whom occupation was know were healthcare providers.
- 2009-10 outbreak: seven of 3,400 case patients were health-care providers (6 of whom likely were infected by patients no know other exposure).

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).



Rubella and the Healthcare Setting

- etting
- Rubella was declared eliminated from the United States in 2004.
- No documented transmission of rubella to HCW or other hospital staff or patients in US healthcare facilities has occurred since elimination was declared.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

MMR Vaccination in HCWs

- Vaccination should be recommended for all HCW who lack presumptive evidence of immunity
- Documentation of 2 doses of MMR vaccine administered ≥28 days apart
- Laboratory evidence of measles, mumps, rubella immunity
- Laboratory confirmation of measles disease
- Birth before 1957
- Birth before 1957→ consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

Serologic testing for Measles, Mumps, and Rubella

- \blacksquare HCW who do not have adequate presumptive evidence of immunity $\xrightarrow{}$ antibody screening not necessary unless cost effective.
- If have 2 documented MMR- no serology needed.
- If have 2 documented MMR and is serologically tested-measles and mumps results are negative or equivocal = not recommended to give additional dose of MMR.
- Documented age-appropriate vaccination supersedes the results of subsequent serologic testing.
- If HCW has 1 documented dose of rubella containing vaccine and determined to have negative or equivocal rubella titer results receipt of an additional dose of MMR for prevention of rubella is not recommended.

 ${\bf Centers \ for \ Disease \ Control \ and \ Prevention.} Immunization \ of \ Health-Care \ Personnel-United \ States, 2011. \\ {\bf MMWR \ 2011; 60(7)}.$

Controlling Measles and Mumps in **Health-Care Setting**

- Engineering controls:
- Isolation of patient:
- Measles (airborne precautions)
- Mumps (droplet precautions) ■ Rubella (droplet precautions)
- Measles outbreak- elimination of HCWs All contacts evaluated for presumptive evidence of measles immunity

 - HGW without immunity should be offered first dose of MMR vaccine and excluded from work from day 5-21 following exposure.

 HGW without immunity and not vaccinated after exposure should be excluded from the facility from day 5 after 1st exposure should be excluded from the facility from day 5 after 1st exposure through 21 days after the last exposure.

 Those with 1 dose of vaccine may remain at work and receive second dose.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011. MMWR 2011;60(7).

Controlling Measles and Mumps in Health-Care Setting (continued)

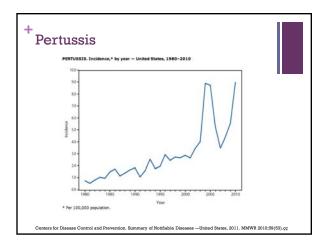
- Mumps outbreak- elimination of HCWs
- All contacts should be evaluated for evidence of mumps immunity
- HCW with no evidence of mumps immunity and exposed should be offered 1st dose of MMR.
- Excluded from duty from day 12 after the first unprotected exposure through day 25 after the most recent exposure.
- \blacksquare HCW with 1 dose of MMR vaccine may remain at work and should remain at work and receive $2^{\rm nd}$ dose.
- HCW with mumps should be excluded from work for 5 days from the onset of parotitis.

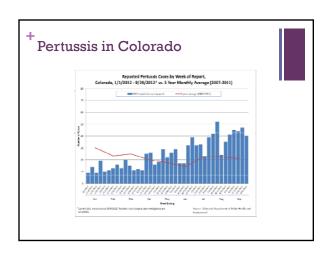
 $Centers for \ Disease \ Control \ and \ Prevention. Immunization of Health-Care \ Personnel-United \ States, 2011. \\ MMWR \ 2011; 60(7).$

Controlling Measles and Mumps in Health-Care Setting (continued)

- Rubella Outbreak- Elimination of HCWs
- If not immune- excluded from duty beginning 7 days after exposure to rubella and continuing through either:
- \blacksquare 23 days after the most recent exposure
- 7 days after rash appears if the provider develops rubella.
- Exposed HCW who do not have adequate presumptive evidence of immunity who are vaccinated post exposure should be excluded from duty fro 23 days after the most recent exposure.
- No evidence exists that postexposure vaccination is effective in preventing rubella infection.

 $Centers for Disease Control and Prevention. Immunization of Health-Care Personnel-United States, 2011.\\ MMWR 2011; 60(7).$





	MMWR	_
Hospital-Acquired	Pertussis Among Newborns Texas, 2004	
to July 10, 2004, staff members at a chilo sting had all been born during June 4-1	eer's beagind in Texas noted that six inflants with pertussis diagnosed by clinical symptoms and confr at the same area general bengilal. The inflates had symptoms consistent with pertussis, including one	med by polymeruse chain mucino gb, congression, epanosis, emesis.
■ Transmission l	as occurred from hospital visitors to patie	ents
■ HCWs to patie	nts	_
■ Patients to HC	<i>N</i> s	
	CW was at work with symptoms of pertuss . Cared for 113 infants 11 of which later of	
Centers for Disease Contro	and Prevention. Hospital-Acquired Pertussis Among Newborns. M	MWR 2008;57(22)

Pertussis Vaccination Recommendations

- Regardless of age, HCW should receive a single dose of Tdap as soon as feasible if have not already received Tdap.
- Tdap is not licensed for multiple administrations → after Tdap continue with Td.
- ACIP in 2011- if don't know when last Td, vaccinate regardless when last Td was given
- \blacksquare Immunity cannot be demonstrated through serologic testing.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011 MMWR 2011;60(7).

Pertussis in Outbreak Settings

- Engineering Controls
- Isolate patient (droplet)
- HCWs with symptoms or positive for pertussis should be excluded from work until 5 days after the start of appropriate therapy.
- Postexposure antimicrobial prophylaxis is recommended for all HCWs who have unprotected exposure to pertussis regardless of vaccination status.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011 MMWR 2011;60(7).

Varicella and HCWs

- With the increase in childhood varicella immunization, HCW exposure is declining.
- Studies of VZV exposure in health-care setting have documented that a single provider with unrecognized varicella can result in the exposure of >30 patients and >30 employees.

Haiduven-Griffiths D, Fecko H. Varicella in hospital personnel: a challenge for the infection control practitioner. Am

Varicella Vaccination Recommendations

- Written documentation of vaccination with 2 doses of varicella vaccine.
- Laboratory evidence of immunity or laboratory confirmation of disease.
- Diagnosis or verification of a history of varicella disease by a health-care provider
- Diagnosis or verification of a history of HZ by a healthcare provider.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011 MMWR 2011;60(7).

How do you verify history?



- Verification of history or diagnosis of typical disease can be provided by:
 - Any health-care provider (e.g. school or occupational clinic nurse, NP, PA, or physician).
- \blacksquare When History is is reported you should seek:
- Epidemiologic link to a typical varicella case or to a laboratory-confirmed case
- Evidence of laboratory confirmation if it was performed at the time of acute disease.
- If documentation is lacking not a valid history

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011 MMWR 2011;60(7).

Varicella in Outbreak Settings



- Isolate patient (airborne)
- Postexposure Management
- All exposed susceptible HCWs should be identified using the criteria for immunity.
- If have received 2 doses of vaccine, monitor for s/sx for 8-12 days.
- \blacksquare If have received 1 dose of vaccine, should receive $2^{\rm nd}$ dose within 3-5 days after exposure to rask.
- Unvaccinated HCWs who have no other evidence of immunity are potentially infective from days 8-21 after exposure and should be excluded from work. Should receive post exposure vaccination as soon as possible.

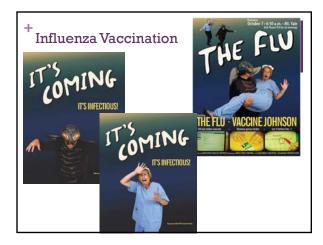
 ${\tt Centers for \, Disease \, Control \, and \, Prevention. \, Immunization \, of \, Health-Care \, Personnel-United \, States, 2011. \, \\ MMWR \, 2011; 60(7).}$

A Shout out for Meningococcal Disease



- Hospital transmission is rare but HCWs have become infected after direct contact with respiratory secretions of infected persons and in laboratory settings.
- Main Rule of Thumb- use precautions.
- MCV4 is not recommended routinely for all HCWs → should be given to laboratory workers that handle specimens (N. meningitides).
- Should receive a single dose of MCV4
- Booster dose every 5 years if they remain at increased risk.

 ${\tt Centers for Disease Control and Prevention.} Immunization of Health-Care Personnel-United States, 2011. \\ {\tt MMWR 2011;60(7)}.$



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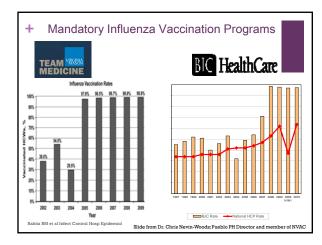
Influenza Vaccination: Everybody is doing it

- January 2007: Joint Commission on Accreditation of Health-Care Organizations (JACHO)- required accredited organizations to offer influenza vaccinations to staff and report levels.
- ACIP in 2010: Recommended Universal Coverage
- 2010- present several medical organizations have submitted support for influenza vaccination and HCWs.
- www.immunize.org/honor-roll
- January 2013, CMS will require acute care hospitals to report HCW influenza immunization rates.

HCW Influenza Vaccination by the Numbers

- 85.6% of physicians
- 77.9% nurses
- 62.8% other HCW
- In hospital setting 76.9% vaccinated
- \blacksquare In physician's office 67.7% vaccinated
- \blacksquare In long term care facility 52.4% vaccinated
- \blacksquare If in hospital where vaccination required 95.2% vaccinated
- \blacksquare If in hospital where not required 68.2% vaccinated

CDC. Influenza vaccination coverage among health-care personnel—United States, 2010–11 influenza season. MMWR 2011;60:1073–7.



Influenza Vaccination Recommendations

- Annual vaccination of all HCWs with either TIV or LAIV.
- Use of LAIV for HCWs who work with patients in a protective environment= theoretical concern
- Transmission of LAIV in health-care settings have not been reported.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 2011 MMWR 2011;60(7).

Influenza in Outbreak Settings

- Engineering Controls
- Isolate patients (droplet)Limit visitors during respiratory season
- Use of antiviral drugs for chemoprophylaxis or treatment of
- influenza is not a substitute for vaccination.
- TIV can be administered to exposed, unvaccinated HCWs at the same time as chemoprophylaxis but LAIV should be avoided.

Centers for Disease Control and Prevention. Immunization of Health-Care Personnel—United States, 201: MMWR 2011;60(7).

Mandatory Influenza Vaccination: Experience of Children's Hospital Colorado



- Largest Pediatric Hospital in Colorado
- Affiliated with University of Colorado Hosp
- Approximately 4,500 staff
- 10,000 employees and non-employees
- First year of mandatory vaccination program immunization rate of 99.7% among employees
- Offer Medical and Religious Declinations

Many Hands- Must Haves



- \blacksquare Backing and support from administration/ HR
- Use evidence based practice to support immunization activity
- Policy must be detailed on who, what, when, and where
- Consequences for non-vaccination
- Who is included- definition of HCW
- How will vaccinations be given
- Make vaccination process EASY
- Influenza Captains
- PR campaigns
- Mass vaccination clinics- can use this with bioterrorism planning

Meeting Documentation Challenges



- Have a system of tracking who has been vaccinated and who hasn't.
- Intranet documentation database
- Online VIS statements, consent forms
- Online compliance reports available to all mangers
- Influenza captains have access to enter information
- Vaccinated elsewhere
- Need to get other hospitals on board with similar vaccination programs.

+ Colorado Board of Health Rule • Approved February 15, 2012

- Developed with extensive stakeholder input
- Applies to all facilities licensed by CDPHE
- Hospitals, Long Term Care Facilities, Ambulatory Surgical Centers
- Other facilities: Assisted Living, Home Health, Dialysis
- Does NOT apply to healthcare entities that are NOT licensed by CDPHE such as outpatient physician clinics, doctor's offices, dental offices, and chiropractor's offices

Slide from Dr. Rachel Herlihy, Immunization Program Director, CDPHE

+ Rule Intent

- To promote patient safety by protecting vulnerable patients from influenza
- To encourage healthcare entities that are already appropriately implementing strategies to prevent influenza to continue to do so
- To assist those entities that can improve
- To prompt entities to adopt more effective policies to prevent influenza.

Slide from Dr. Rachel Herlihy, Immunization Program Director, CDPHE

Requirement of the Rule

- Reporting
- All healthcare entities licensed by CDPHE must keep track of the number of its employees that are vaccinated against seasonal influenza and
- Annually report that number to CDPHE
- There is no exemption from the annual reporting requirement of the rule
- Policy implementation
- There are different policy requirements for different types of healthcare entities

 There are different policy requirements for different types of healthcare entities.
- The rule allows for an exemption from the policy requirements if certain vaccination targets are met

Slide from Dr. Rachel Herlihy, Immunization Program Director, CDPHE

Phased –in Approach

- Vaccination Targets
- 60 percent of all employees vaccinated by December 31, 2012.
- 75 percent of all employees vaccinated by December 31, 2013
- 90 percent of all employees vaccinated by December 31, 2014 and every year thereafter
- If target is met, facility is exempt from policy implementation requirement for the next year

Slide from Dr. Rachel Herlihy, Immunization Program Director, CDPHE

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- Presentaion : Influenza Vaccination of Healthcare workersHCPIVS-NVAC 2012 given by Dr. Chris Nevin-Woods, and Dr. Rachel Herlihy