

VACCINATIONS FOR OLDER PATIENTS

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Objectives

- Incorporate current CDC guidelines into your practice
- Identify and vaccinate appropriate adult patients
- Discuss vaccine myths with patients and other providers



Introduction

Immunization is the process whereby a person is made immune or resistant to an infectious disease.

Vaccines stimulate the immune system to protect the person against infection and disease.

World Health Organization, 2016



Types of Vaccines

- Attenuated
 - An infectious agent altered to become harmless or less virulent
 - Should be avoided if immunocompromised
 - May induce more permanent immunity
 - Worst case: may cause disease

www.vaccines.gov



Types of Vaccines

- Inactivated
 - Pathogen is destroyed by heat, chemicals or radiation
 - Stimulate a weaker immune response
 - May require a booster dose
 - Worst case: does not work

www.vaccines.gov



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Types of Vaccines

- Toxoids
 - Used to induce immunity against toxins produced by pathogens
 - Toxins inactivated with formalin to render harmless
 - Examples: Diphtheria and tetanus

www.vaccines.gov



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Examples of Vaccines (adult)

Live

- Influenza (intranasal)
- Zostavax
- Varicella

Inactivated

- Influenza (IM)
- TDAP
- Shingrex
- Hepatitis A & B
- Pneumococcal



Immunosenescence

- Progressive, age-related deterioration in the ability to respond to infections
- Increased susceptibility to cancers and infections
- Associated with a higher mortality rate in the elderly
- Decreased response to vaccinations

Immunology. 2007 Apr; 120(4): 435-446



Special Populations

- Severely immunocompromised patients
 - Active malignancy, alcoholics, HIV
 - Should not receive live vaccines
- Immunosuppressive therapy
 - Prednisone: >20mg daily for at least 2 weeks
 - Wait 1 month before administering live vaccines
 - Biologicals: safe to administer vaccine, best to give prior to starting therapy

• National Center for Immunization and Respiratory Diseases



Community Immunity

- Commonly known as ‘herd immunity’
- A critical portion of the population is immunized against a contagious disease
- Disease reservoir is reduced or eliminated
- Unvaccinated people benefit from contained contagion

• The National Institute of Allergy and Infectious Diseases (NIAID)



Community Immunity

- R_0 (R naught) is the number of people predicted to become infected by one person
- R_0 for influenza is about 1.5
- R_0 for pertussis is about 15
- R_0 is the basis for calculating threshold
- Example: R_0 for measles is about 15
 - (Unvax pop): 1 – 15 – 225 – 3375 – 50,600 people
 - (Vax pop 90%): 1 – 2 – 3 – 5 – 8 people



Community Immunity

Disease	R_0	Threshold (%)
Mumps	4-7	75–86
Polio	5-7	80–86
Smallpox	5-7	80–85
Diphtheria	6-7	85
Rubella	6-7	83–85
Pertussis	12-17	92–94
Measles	12-18	83–94



Vaccination Recommendations

- CDC (Centers for Disease Control)
 - Publishes schedules from recommendations made by
 - ACIP – Advisory Committee on Immunization Practices
 - American Academy of Family Physicians
 - American College of Obstetrics and Gynecology
 - American College of Physicians



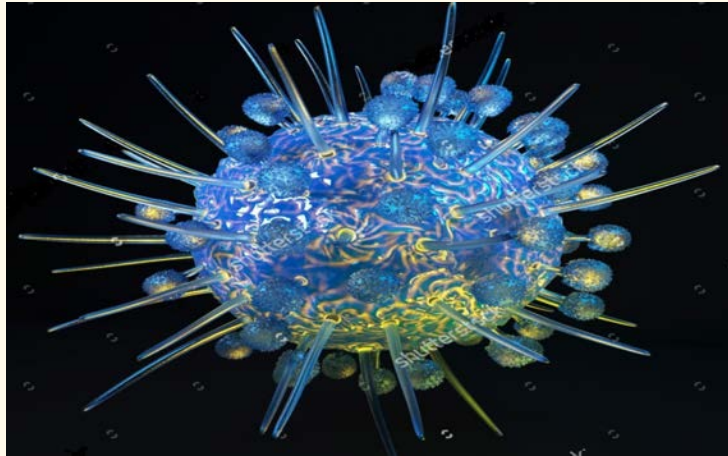
Adult Immunization Schedule 2019

Table 1 Recommended Adult Immunization Schedule by Age Group
United States, 2019

Vaccine	19–21 years	22–26 years	27–49 years	50–64 years	≥65 years
Influenza inactivated (IIV) or Influenza recombinant (RIV) or Influenza live attenuated (LAIV)	1 dose annually				
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap, then Td booster every 10 yrs				
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)				
Varicella (VAR)	2 doses (if born in 1980 or later)				
Zoster recombinant (RZV) (preferred) or Zoster live (ZVL)	2 doses or 1 dose				
Human papillomavirus (HPV) Female	2 or 3 doses depending on age at initial vaccination				
Human papillomavirus (HPV) Male	2 or 3 doses depending on age at initial vaccination				
Pneumococcal conjugate (PCV13)	1 dose				
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses depending on indication				



Influenza



Influenza

- Trivalent and quadrivalent forms
- Antigen selection based on recent outbreaks
- May take nearly 6 months to create
- Reduces risk by 90 % in healthy adults
- Reduces risk in frail elderly by 30-40%
 - Up to 4x morbidity/mortality due to flu

Influenza

- High-dose influenza vaccine
 - Approved for people age 65 and older
 - 4x the amount of antigen
 - Reported to be 25% more effective compared to regular dose
 - CDC does not specifically recommend
 - Patients more likely to develop side effects
 - Fever, injection site pain



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Influenza

- Attenuated, intranasal vaccine
 - Flumist: Contains 2 Type A and 2 B
 - Not for use in immunocompromised patients
 - Not for use in moderate/severely ill patients
 - Approved for ages 2 – 49
 - CDC does not specifically recommend

• www.cdc.gov



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Tetanus, Diphtheria, Pertussis

- Forms
 - Td – tetanus toxoid, diphtheria toxoid
 - Tdap – tetanus and diphtheria toxoids with acellular pertussis
- Recommendations
 - Td – every 10 years
 - Tdap
 - One time dose to replace Td booster
 - For adults who have close contact with infants < 12 months old



Tetanus



Sir Charles Bells portait of a soldier dying of tetanus. The characteristic rigidity of the body is referred to as opisthotonos and risus sardonias. Original in the Royal College of Surgeons of Edinburgh, Scotland.



Tetanus

- Caused by *Clostridium tetani*
- Spores are found in soil, dust, feces
- Disease does not confer immunity
- Disease caused by toxin
 - Binds in the CNS, blocks neurotransmitters which prevents muscle relaxation and causes tetany



Tetanus

- Presents with descending symptoms
 - Trismus (lockjaw), difficulty swallowing, muscle rigidity and spasms
- Symptoms persist for about one month
- Over 30% mortality
- Complications: respiratory distress, bone fractures, pneumonia



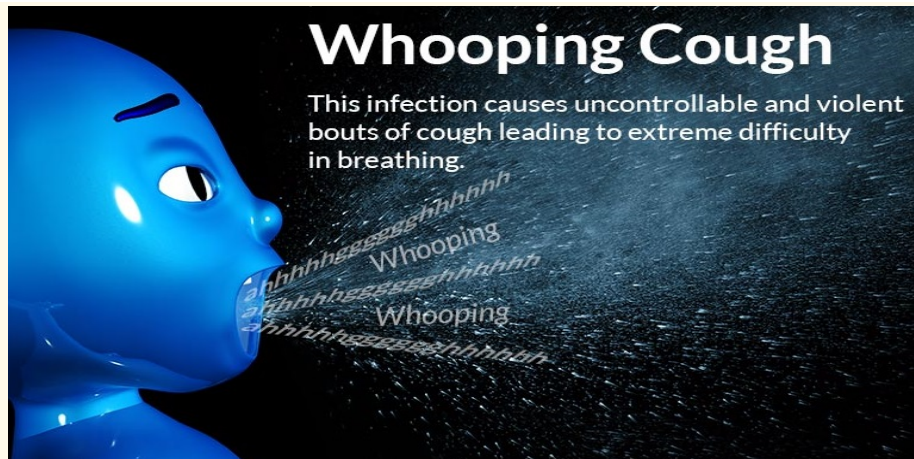
Diphtheria



Diphtheria

- Caused by *Corynebacterium diphtheriae*
- Can involve any mucous membrane
- Exudative pharyngitis is most common
 - Pulmonary obstruction due to pseudo membrane formation

Pertussis



Pertussis Vaccine

- Whole cell pertussis vaccine (DTwP)
 - Linked to acute encephalopathy and seizures
 - No longer available
- Acellular pertussis vaccine (DTaP, Tdap)
 - Developed due side effects of DTwP
 - Contains components of cell of the bacteria
 - Fewer AE with no reports of encephalopathy



Acellular Pertussis Vaccine

- Less effective than whole-cell vaccine
- Give one Tdap in place of tetanus booster
- Immunized patient may be carriers
- Recent resurgence in whooping cough
 - Possibly due to immunized carriers
 - Not having received adult booster (Tdap)
 - Unimmunized patients create reservoir of disease



Varicella – Chicken pox



Varicella – Shingles



Varicella Zoster Virus

- Chicken pox is the primary infection
- Herpes zoster (“shingles”) – reactivation
- Highly contagious
- Varicella vaccine part of childhood regimen
- Can be given up to age 40
- Unknown if life-long immunity

Zoster Vaccine

- Two forms
 - Zostavax (live attenuated)
 - Shingrex (inactivated)
- Recommendation
 - All patients over age 50
 - Shingrex preferred due to safety and efficacy
 - Regardless of previous varicella vaccination



Zostavax

- Identical to varicella vaccine (attenuated) but with ~15x higher titer
- About 50% effective
- Can not be given to immunocompromised
- CDC recommends to adults 60 and over

• www.cdc.gov



Shingrix

- Recombinant zoster vaccine
- Should be given to all patients previously immunized patients
- Two-part dose given 2 – 6 months apart
- Preferred vaccine by CDC
- For patient age 50 and older

• www.cdc.gov



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Pneumococcal Vaccine



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Pneumococcal Vaccine

- *Streptococcus pneumoniae*
 - 90 known serotypes
 - Drug resistant strains are becoming more common – up to 30%
 - 23 serotypes account for 85-90% of invasive disease
 - 13 serotypes account for 61% of disease in younger patients



Pneumococcal Vaccine

- 23-valent pneumococcal poly-saccharide vaccine
 - Pneumovax (PPSV23)
 - Indicated for adults over age 50
- 13-valent pneumococcal conjugate vaccine
 - Prevnar 13 (PCV13)
 - Indicated for adults over age 65



Pneumococcal Vaccine

- General Recommendations
 - All patients 65 or over – Prevnar 13 followed by Pneumovax 12 months later
 - Under age 65 - Pneumovax should be given in any of the following conditions:
 - Smokers and nursing home residents
 - Chronic heart, lung, or liver disease
 - Alcoholism
 - Diabetes

• Recommended Adult Immunization Schedule, Footnote 8



Pneumococcal Vaccine

- Immunocompromised recommendations
 - No previous – Prevnar 13 followed by Pneumovax in 8 weeks, booster in 5 years
 - Vaccinate at least 2 weeks before immunosuppressive therapy or splenectomy
 - Vaccinate newly diagnosed HIV patients early

• Recommended Adult Immunization Schedule, Footnote 8



Pneumococcal Vaccine

- Qualifications for immunocompromise
 - Any immunodeficiency and malignancy
 - Transplant patients
 - Organ failure, including functional asplenia
 - Immunosuppressive therapy

• Recommended Adult Immunization Schedule, Footnote 8



Vaccine Information Statements

- Required under the National Childhood Vaccine Injury Act
- “All health care providers...shall, prior to administration of each dose of the vaccine, provide a copy to keep of the relevant current edition...”
- www.cdc.gov/vaccines/pubs/vis



Vaccine Information Statements

- The medical record must include:
 - The edition date of the VIS
 - The date it was provided to the patient
 - Name, address, and title of person administering the vaccine
 - Date of administration
 - Vaccine manufacturer and lot number

www.cdc.gov/vis



Litigation and Liability

- 2016 CA law removes all exemptions for childhood vaccines
- CDC guidelines and quality measures are in place
- Would be difficult to prove preventable outcome
- Who would be liable?



Summary

- Shingrix after age 50
- Prevnar 13 and Pneumovax 23 after age 65, one year apart
- Tdap once as an adult to replace Td
- Influenza yearly
- Use high dose influenza over 65



MYTHS About Vaccines

- “Aluminum leads to dementia and neurologic diseases”
 - Used in some vaccines to improve the immune response for over 70 years
 - Quickly eliminated
 - More aluminum is absorbed through food, drink, and antacids than vaccines



MYTHS About Vaccines

- “Formaldehyde causes blindness, encephalopathy, seizures, leukemia”
 - Used to detoxify toxins
 - Used to inactivate viral vaccines
 - Miniscule amount in vaccine is safe

www.chop.edu; www.cdc.gov



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MYTHS About Vaccines

- “The pneumonia shot doesn’t work”
 - General misconception that the vaccine prevents all pneumonia
 - Providers need be clear regarding the purpose
 - 60 – 70% effective in preventing pneumococcal pneumonia

www.cdc.gov



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MYTHS About Vaccines

- “The flu shot doesn’t work”
 - Age and comorbidities can be a factor
 - Consider high-dose vaccine over age 65
 - Depends on the strains of virus in the vaccine
 - Vaccine will provide at least some protection

- www.cdc.gov;
- www.chop.edu
- www.adultvaccination.org;



MYTHS About Vaccines

- “I can get the flu from the vaccine”
 - Inactivated influenza vaccine does not contain any live virus
 - No chance of causing the flu
 - Muscle aches and low-grade fever can occur
 - Preemptively recommend acetaminophen or nsaids

- www.cdc.gov;
- www.vaccineinformation.org;
- www.chop.edu;



Provider MYTHS

- “You have to wait at least 5 years between Td and Tdap vaccines”
 - There is no minimum interval between these vaccines
 - Could be given together if necessary

- www.cdc.gov
- www.immunize.org;



Provider MYTHS

- “You can only give one vaccine per visit”
 - There is no established limit
 - All recommended vaccines should be administered during the same visit
 - Live vaccines can be given together OR separated by 4 weeks
 - Inactivated vaccines can be given at any interval

- www.cdc.gov
- www.immunize.org;



Provider MYTHS

- “You can’t give vaccines to ill patients”
 - Vaccines can be given during mild acute illness with a fever
 - Vaccines can be given during a course of antibiotics

- www.cdc.gov
- www.immunize.org;



Provider MYTHS

- “You need to check vitals prior to vaccination”
 - ACIP does not recommend checking vitals before vaccination
 - Mild illness and fever is not a reason to withhold administration
 - Can increase visit time unnecessarily

- www.cdc.gov; www.immunize.org;



Resources

- American Geriatric Society – www.jags.com
- British Society of Rheumatology
- CDC - www.cdc.gov/vaccines/
- Immunization Action Coalition - www.immunize.org/
- Morbidity and Mortality Weekly Report - www.cdc.gov/mmwr/
- National Foundation for Infectious Diseases - www.nfid.org/
- National Network for Immunization Information - www.immunizationinfo.org/
- Natural News - www.naturalnews.com
- US Pharmacist – www.uspharmacist.org
- Vaccine Adverse Event Reporting System - vaers.hhs.gov/
- WebMD – www.webmd.com



Questions

