



NORTHWEST AIDS EDUCATION AND TRAINING CENTER

Vaccines for the HIV-infected Patient

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Vaccines: Overview

- Review general principles
- Review recommended vaccines in adults
- Review use of live vaccines
- Special considerations: nonresponse and revaccination

Vaccines: General Principles

- Goal is prevention
- Timing is a consideration
 - HIV+ patients have decreased immunologic response to most vaccines
 - Factors associated with poor response
 - Low CD4 count
 - Lack of virologic suppression
 - Vaccinating early (pro/con):
 - Earlier protection against more common infections
 - Decreased likelihood of response if low CD4 counts
- Live vaccines and low CD4 counts

Vaccines: Hepatitis A

Hepatitis A:

- Now universal vaccination at age 1 year
- 100% HIV+ children with CD4% >20 seroconverted
- Recommended for non-immune HIV-infected adults who are MSM, IDU, chronic liver disease, travel to endemic countries
- OI guidelines recommend checking Hep A Ab 1 month after series (no correlate of immunity though) – ACIP guidelines do not recommend Ab testing

Hepatitis B Vaccination

Hepatitis B:

- Now universal vaccination at birth
- Recommended for all non-immune HIV-infected adults
- Efficacy 18-72%; possibly greater once viral load suppressed
- ACIP recommends 40mcg (double dose) x 3 (Recombivax) or 4 doses (Energix-B)
- OI prevention guidelines recommend standard 20mcg x 3 doses
- Special consideration: Isolated core Ab positive

Isolated Hepatitis B cAb

- Isolated cAb positivity could indicate:
 - Past infection with waning sAb
 - False positive
 - Occult Hep B infection
- Unclear what to do with regards to vaccination
 - If unexplained persistently abnormal transaminases, check an Hep B DNA
 - Most would either give a booster vaccine and check for anamnestic response or give the complete vaccine series
 - OI guidelines 2013 recommend complete vaccine series with Hep BsAb 1 month after completion
 - Now HIV Primary Care Guidelines recommend checking HBV DNA and vaccinating if negative

Vaccines: Pneumococcal Disease

Pneumococcal polysaccharide vaccine (PPV23):

- HIV+ patients at higher risk for invasive pneumococcal disease
- Efficacy of vaccine if CD4 count < 200 unknown
- Vaccine should be given to those with CD4 counts < 200, but revaccinate once over 200
- Give booster 5 years after baseline vaccine and again after 65 year old if > 5 years from prior

Vaccines: Pneumococcal Disease

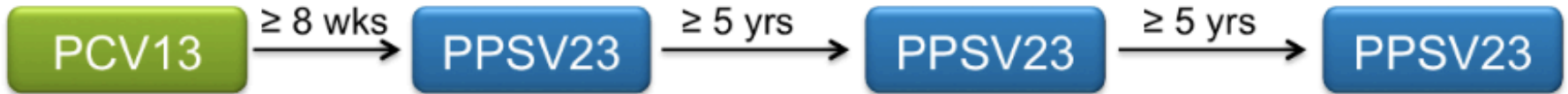
- PPSV23 – contains polysaccharide antigens
- PCV13 – contains immunogenic proteins conjugated to pneumococcal polysaccharides

- Prevnar 13 (PCV13) now recommended for some immunocompromised adults
 - FDA approved for adults age ≥ 50 age 12/2011
 - ACIP formal recommendations 10/2012
 - Study from Malawi - PCV7 prevented 74% of recurrent invasive pneumococcal disease

Pneumococcal Vaccine Algorithm

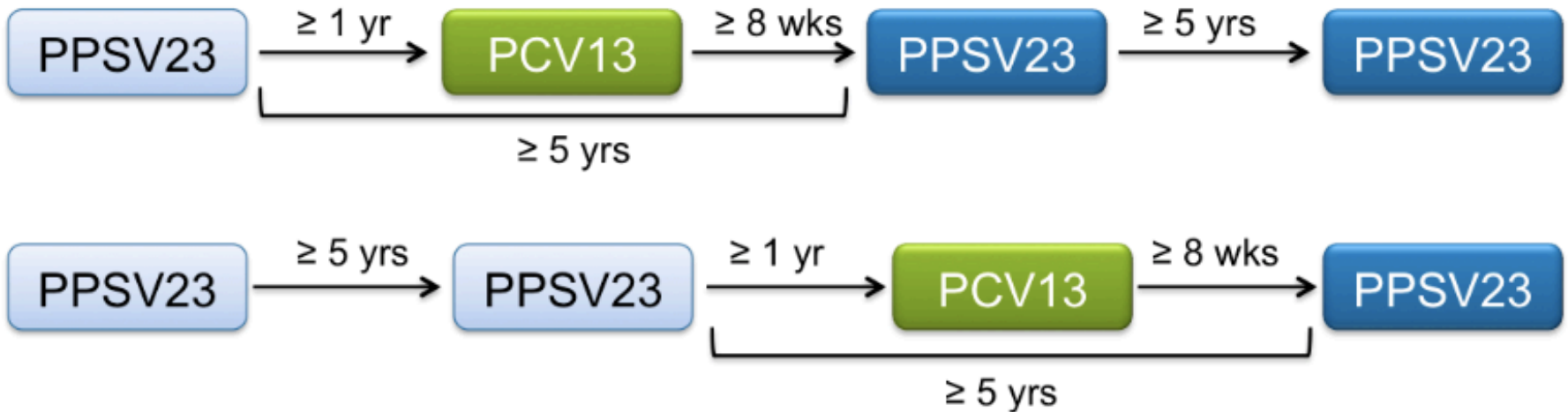
Pneumococcal Vaccine-Naïve Adults

≥ Age 65



PPSV23-Immunized Adults

≥ Age 65



Vaccines: Influenza

- Influenza can be more severe in patients with HIV
- No increased adverse effects with inactivated vaccine
- Efficacy ranges from 27-78%
- Live vaccine not recommended currently
- Household members can receive live vaccine though

Vaccines: Tdap

- No specific recommendations for HIV+ patients
- Tdap should replace single dose of Td regardless of interval since last Td

Vaccines: HPV

- Not a live vaccine, so safe in HIV and other immunocompromising conditions
- 2 vaccines available (bivalent and quadrivalent)
- Females – either vaccine recommended from ages 11-26 years
- Males – quadrivalent vaccine 11-26 years

- No recommendations for HIV+ individuals greater than 26 years

Vaccines: Live Vaccines

- Varicella Vaccine:
 - All adults without evidence of immunity if CD4 count > 200
- Zoster Vaccine:
 - Contraindicated for patients with CD4 counts < 200
 - Safe and immunogenic in adults with CD4 counts > 200 and viral load < 75 copies/mL (Benson C et al. Abstr #96. CROI 2012)
 - No recommendations in patients with CD4 counts > 200, except Primary Care Guidelines recommend considering for age >60 with CD4 >200
- MMR Vaccine:
 - Not recommended for HIV+ patients with CD4 counts < 200

Special Considerations

- Vaccine nonresponse
 - What is a response?
 - Is there a correlate of immunity?
- Hepatitis B
 - Protective titer ≥ 10 IU
 - Check titer within 1-2 months after completion of doses
 - If subpar, consider repeating series when VL suppressed and/or double dosing (Launay O et al. JAMA 2011;305:1432)
 - Double dose x 4 led to 82% response rate vs. 65% with standard dosing

Vaccines: ACIP 2013 Adult Schedule

VACCINE ▼	INDICATION ►	Pregnancy	Immuno-compromising conditions (excluding human immunodeficiency virus [HIV]) ^{4,6,7,10,11}	HIV infection CD4+ T lymphocyte count ^{2,4,6,7,10,14,15}		Men who have sex with men (MSM)	Heart disease, chronic lung disease, chronic alcoholism	Asplenia (including elective splenectomy and persistent complement deficiencies) ^{13,14}	Chronic liver disease	Kidney failure, end-stage renal disease, receipt of hemodialysis	Diabetes	Healthcare personnel	
				< 200 cells/µL	≥ 200 cells/µL								
Influenza ^{2,*}				1 dose IIV annually		1 dose IIV or LAIV annually	1 dose IIV annually					1 dose IIV or LAIV annually	
Tetanus, diphtheria, pertussis (Td/Tdap) ^{3,*}		1 dose Tdap each pregnancy		Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs									
Varicella ^{4,*}			Contraindicated		2 doses								
Human papillomavirus (HPV) Female ^{5,*}				3 doses through age 26 yrs			3 doses through age 26 yrs						
Human papillomavirus (HPV) Male ^{5,*}				3 doses through age 26 yrs			3 doses through age 21 yrs						
Zoster ⁶			Contraindicated		1 dose								
Measles, mumps, rubella (MMR) ^{7,*}			Contraindicated		1 or 2 doses								
Pneumococcal polysaccharide (PPSV23) ^{8,9}							1 or 2 doses						
Pneumococcal 13-valent conjugate (PCV13) ^{10,*}							1 dose						
Meningococcal ^{11,*}							1 or more doses						
Hepatitis A ^{12,*}							2 doses						
Hepatitis B ^{13,*}							3 doses						

Vaccines: Resources

- ACIP guidelines:
 - <http://www.cdc.gov/mmwr/preview/mmwrhtml/su6201a2.htm>
- OI prevention guidelines:
 - http://aidsinfo.nih.gov/contentfiles/lvguidelines/Adult_OI.pdf
- HIV Primary Care guidelines
 - <http://cid.oxfordjournals.org/content/early/2013/11/12/cid.cit665.full#T2>

Questions?