Adult Immunization

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Objectives

- At the end of the lecture, the student should be able to
  - Discuss essential concepts on immunization and its classifications
  - Recognize the different adverse reactions, indications, and contraindications to vaccination
  - Determine an immunization plan for adults

Outline

- Immunization and the Immune System
- General Principles of Immunization
  - General Vaccination RUles
  - Adverse Reactions
  - Contraindications
- 2018 Adult Immunization Schedule

The Immune System

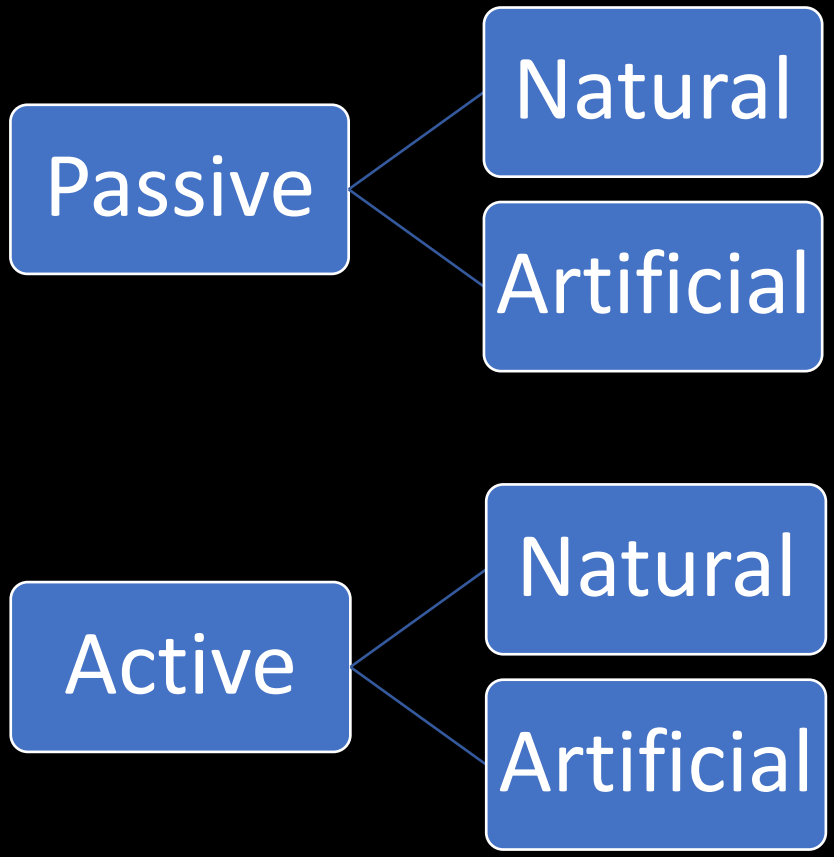
Innate Immune System

- Anatomic barriers
- Physiologic barriers
- Complement pathway
- Pattern recognition receptors (PRRs)
- Mononuclear phagocytes
- Granulocytes

Adaptive Immune System

- T cells (cell-mediated)
- B cells (humoral or Ab-mediated)

Types of Immunization



Types of Vaccines

Type	Vaccines
Live, attenuated	MMR, varicella, influenza (nasal spray), rotavirus, zoster/shingles (Zostavax/ZVL), yellow fever, oral polio; BCG
Inactivated/killed	Polio (IPV), influenza (IM), Hepatitis A, rabies; Japanese B encephalitis
Toxoid	Diphtheria, tetanus (part of DTaP)
Subunit/ recombinant	Hepatitis B, pertussis (part of DTaP), PPSV-23, meningococcal, HPV, shingles (Shingrix/RZV)
Conjugate (special type of subunit)	Hib, PCV-13

General Vaccination Rules

- There are NO contraindications to the simultaneous administration of any vaccine.
- Spacing of vaccine combinations not given simultaneously
  - Two live injected – at least 4 weeks apart
  - All other vaccines – no minimum interval
- Spacing of live vaccine and blood products (Ig or plasma)
  - If live vaccine given first, wait at least 2 weeks before giving Ab
  - If blood product is given first, give MMR/varicella at least 3 months after; HZ and yellow fever may be given at any time

General Vaccination Rules

- Dosing intervals of the same vaccine
  - Vaccines should NOT be administered at intervals LESS than the recommended minimum or earlier than the minimum ages (except measles outbreak and impending travel)
  - Increasing the interval between doses does NOT diminish effectiveness
  - It is NOT necessary to restart the series of any vaccine due to extended intervals between doses

Adverse Reactions

- Adverse events may be true vaccine reactions or coincidental events/human or program error
- Local reactions:
  - Pain, redness, swelling at injection site
  - Common with inactivated vaccines, usually mild or self-limited
- Systemic reactions:
  - Fever, malaise, headache
  - Nonspecific, may not be related to vaccine
- True allergic reactions to vaccine or vaccine components are rare

Contraindications and Precautions

Contraindications and Precautions

Condition	Live	Inactivated
Allergy to vaccine	C	C
Encephalopathy	C	C
Pregnancy	C	V*
Immmunosuppresion	C	V
Severe Illness	P	P
Recent blood products	P**	V

C-contraindication P- precaution V- vaccinate if indicated
*except HPV ; administer Tdap preferably second or third trimester
**MMR and varicella-containing, except zoster and yellow fever vaccine

Invalid Contraindications to Vaccination

- mild illness
- disease exposure or convalescence
- antibiotic therapy
- pregnancy in the household
- Breastfeeding
- allergies to products in the vaccine
- premature birth
- family history unrelated to immunosuppression
- need for TB skin testing
- need for multiple vaccines
- minor illness- low grade fever, upper respiratory tract infection, otitis media
- mild diarrhea

2018 Immunization Schedule

Figure 1. Recommended immunization schedule for adults aged 19 years or older by age group, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

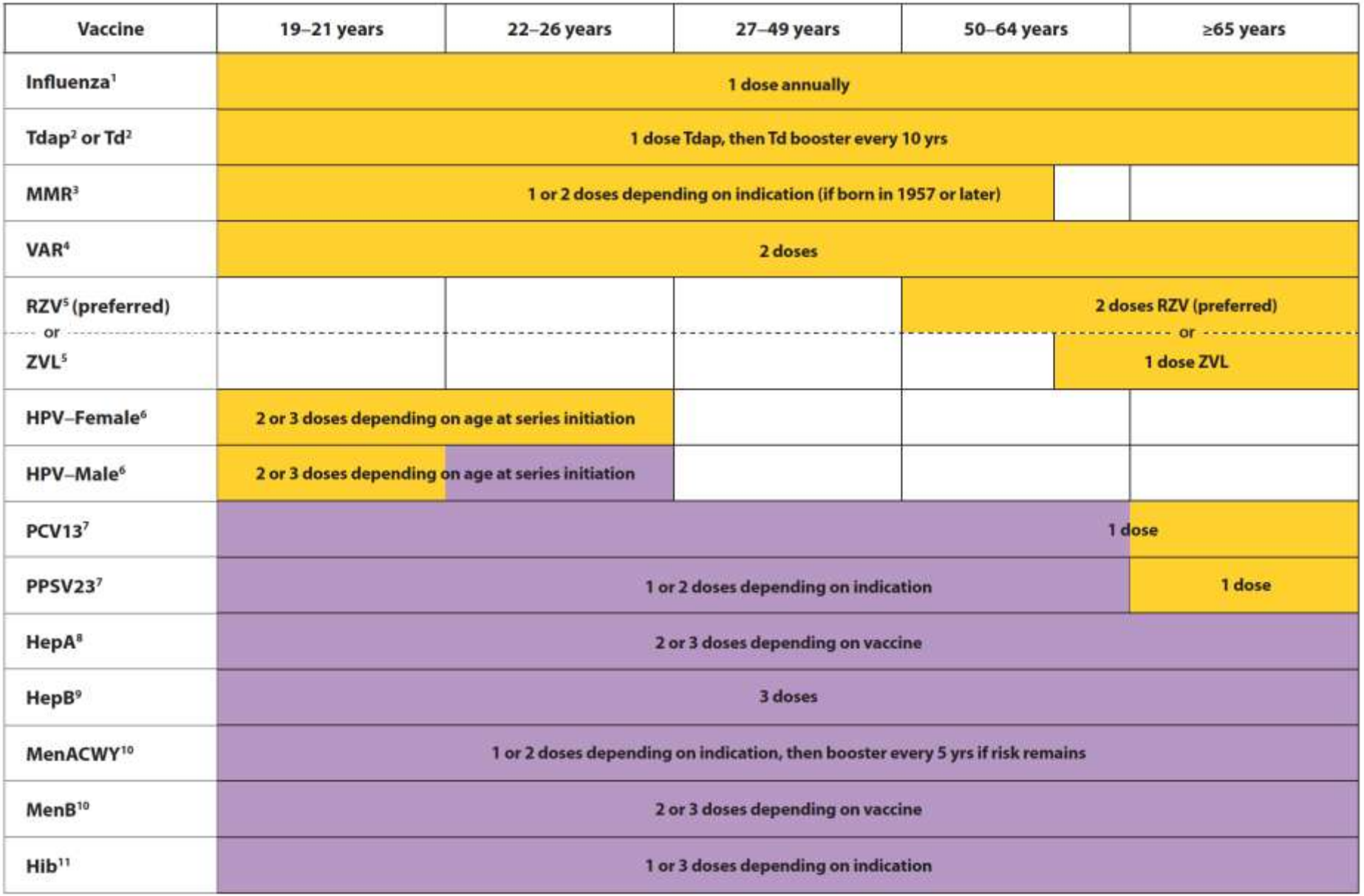
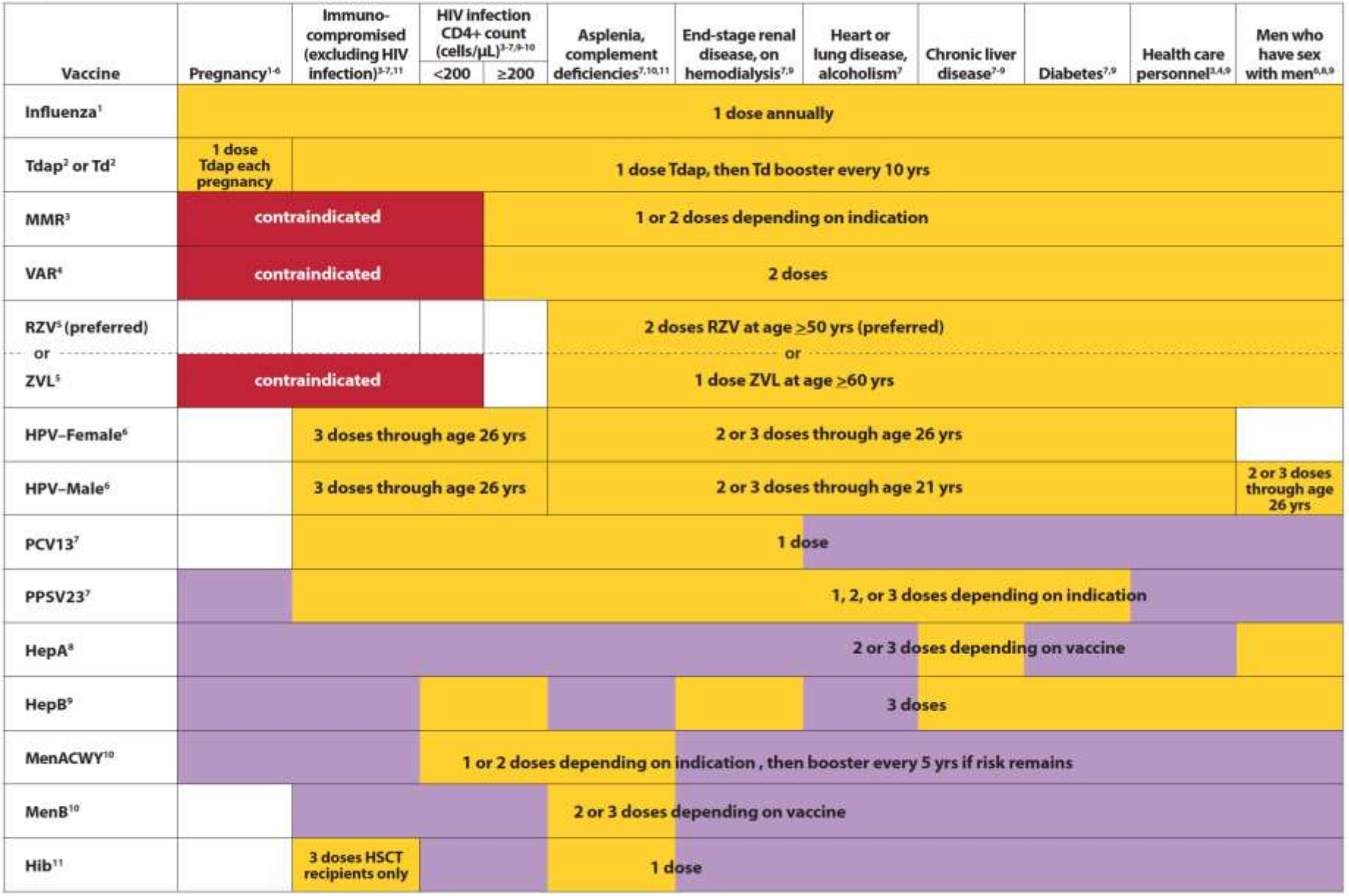


Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.



Vaccine

- Type
- Route
- Schedule
- Other comments

Influenza

- In the PHL, inactivated
- IM
- Annual
- Southern hemisphere, available as tri- and quadrivalent

TDAP

Mixed (T/D toxoid, aP subunit)

IM

1 dose TDaP, TD every 10y thereafter

Give to adults who haven’t received TT/D/aP as an adult or child (11-12y), or can’t remember

MMR

Live, attenuated

SC

1-2 doses, at least 28 days apart

Evidence of immunity: born before 1957 (except HCW), documentation of MMR, antibody titers; For women, give 3-months before planned conception and they should not get pregnant until 3 months after

Varicella

Live, attenuated

SC

2 doses, at least 28 days apart

Evidence of immunity: Documentation of 2 doses VAR at least 4wks apart, antibody titers, verification of disease by HC provider

Herpes zoster

LIVE/ZOSTAVAX	RECOMBINANT/SHINGRIX
Live, attenuated (ZVL)	Recombinant (RZV)
SC	IM
One dose	0, 2-6 months
Regardless of past episode of varicella, HZ	Now the vaccine of choice for HZ; Give regardless of past episode of varicella, HZ, or receipt of ZVL; must give 2 months after ZVL

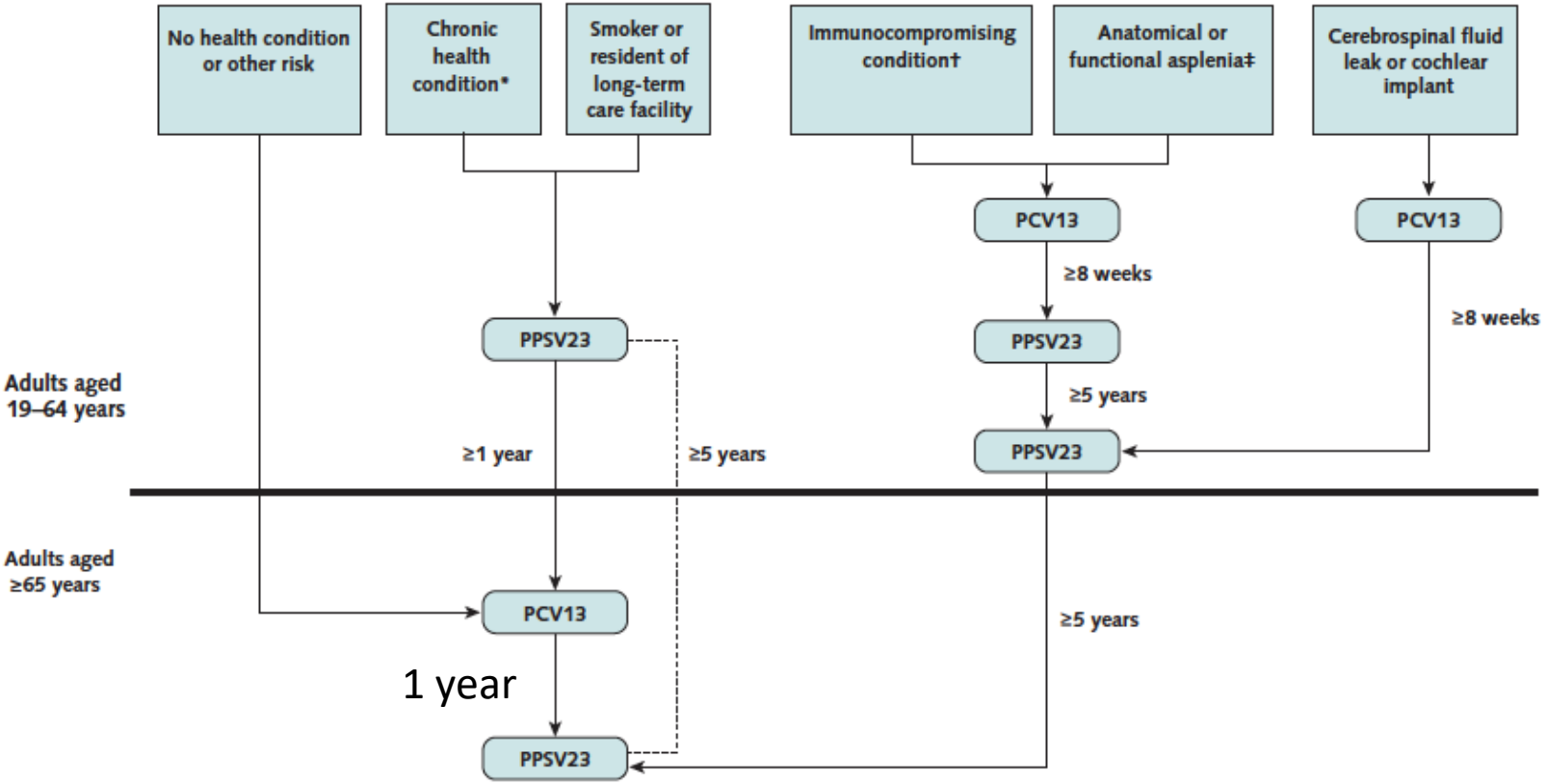
Human Papilloma Virus

Female	Male
Recombinant (4 or 9 strains)	Recombinant (4 or 9 strains)
IM	IM
For adults: 3 doses, 0/1-2/6 months	For adults: 3 doses, 0/1-2/6 months
Ages 15-26; 2 doses for ages 9-14 HPV 6,11,16,18	Ages 15-26*; 2 doses for ages 9-14 HPV 6,11,16,18, 31, 33, 45,52, 58

Pneumococcal

PCV-13	PPSV-23
Recombinant (4 or 9 strains)	Recombinant (4 or 9 strains)
IM	IM
For adults: 3 doses, 0/1-2/6 months	For adults: 3 doses, 0/1-2/6 months
Ages 15-26; 2 doses for ages 9-14 HPV 6,11,16,18	Ages 15-26*; 2 doses for ages 9-14 HPV 6,11,16,18, 31, 33, 45,52, 58

Figure 3. Recommended pneumococcal vaccination schedule and intervals, by age, health condition, and other risks.



Hepatitis A

Inactivated

IM

2 doses, 0-6 months

Also available in combo with Hep B (Twinrix), given 0-1-6 months

Hepatitis B

Recombinant; HBsAg expressed in yeast, purified and given as vaccine

IM

3 doses; 0-1-6 months

Accelerated schedule: 0-1-2-12 months

For combo Hep A/B: 3 doses, 0-1-6 months

Meningococcal ACWY

Conjugated (the polysaccharide MPSV4 no longer recommended)

IM

2 doses, at least 28 days apart

Evidence of immunity: Documentation of 2 doses VAR at least 4wks apart, antibody titers, verification of disease by HC provider

Meningococcal B

Recombinant

IM

2 doses, at least 28 days apart

Evidence of immunity: Documentation of 2 doses VAR at least 4wks apart, antibody titers, verification of disease by HC provider

Haemophilus influenza type B

Conjugated

IM

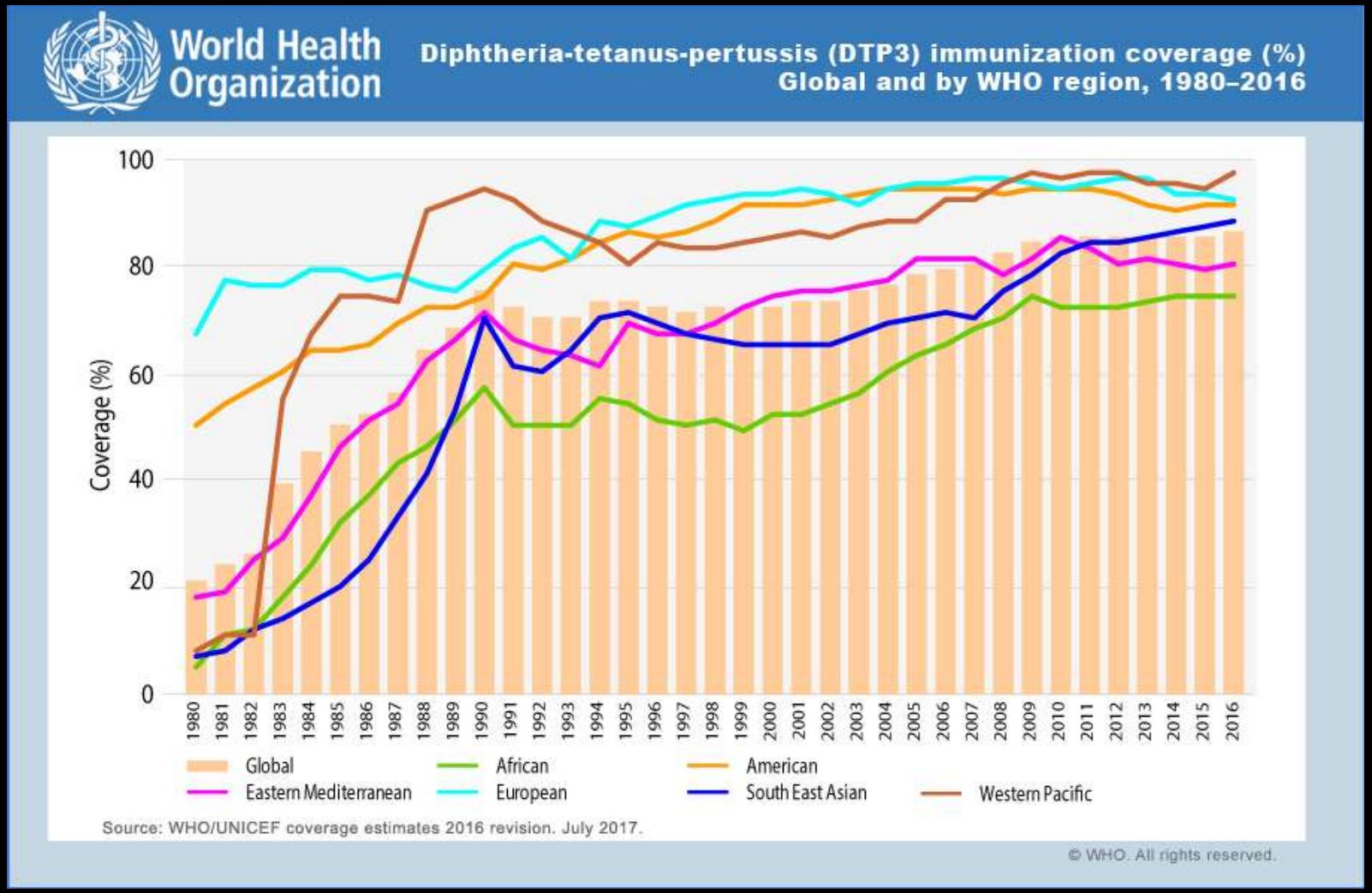
Dosing depends on indication, 1-2 doses

Pre-splenectomy: 1 dose at least 14 days prior

Post-HSCT: 3-dose series, doses 4 wks apart, starting 6-12 months after successful transplant

Global Immunzation: Current Status

Goal: Polio eradication



A successful eradication program meets the following conditions:

- Infection must be limited to humans, with no animal reservoir
- In viral infections, there must be only one or a few strains of the virus, with constant antigenic properties
- The virus must not persist in the infected host
- There must be an effective vaccine

Download "CDC Vaccine Schedules" free for iOS and Android devices.

Product Specs

Version: 5.0.2

Requirements: Requires iOS 8.0 or later and Android 4.0 or later; optimized for tablets and useful on smartphones.

Updates: Changes in the app are released through app updates.

Download app free for **iOS**

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References

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- Ada G. NEJM. 2001;345(14):1042-53.
- ACIP 2018 Adult Immunization Schedule
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- WHO: http://www.who.int/news-room/fact-sheets/detail/immunization-coverage