KANSAS HEALTH INSTITUTE

Informing Policy. Improving Health.

Ad Astra ECHO®

Ad Astra ECHO® Series

Immunizations in Kansas

KANSAS HEALTH INSTITUTE
Informing Policy. Improving Health.

Immunizations for Health Aging

December 15, 2023

Ad Astra ECHO®

Who We Are

- Nonprofit, nonpartisan educational organization based in Topeka.
- Established in 1995 with a multi-year grant by the Kansas Health Foundation.
- Committed to convening meaningful conversations around tough topics related to health.

Today's Agenda

10:00 Welcome

10:05 Didactic Presentation

10:30 Panel Discussion

11:00 Case Presentation

11:20 Closing Remarks

11:30 Adjourn

Today's Presenters

Dr. Joan Duwve, M.D., M.P.H.
State Health Officer
KDHE

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Kansas
Department of Health and Environment
Division of Public Health

Immune Function Changes with Age: The Role of Immunizations

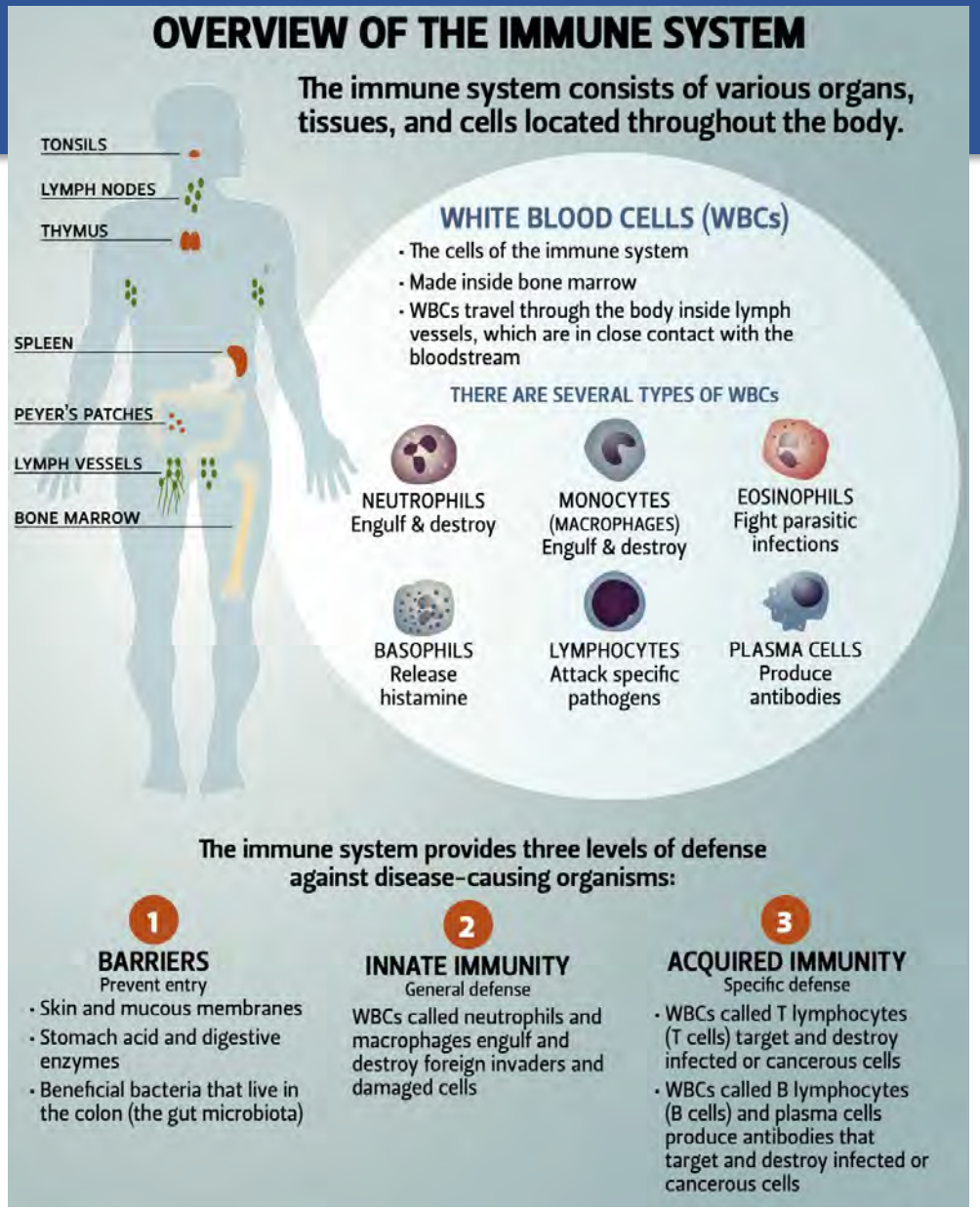
Joan Duwve, MD, MPH | State Health Officer | 12/15/2023

Conflict of Interest Statement

Dr. Duwve has no known conflicts of interest

What IS the Immune System?

- We are constantly exposed to a variety of microorganisms present in the environment, such as viruses, bacteria and fungi.
- The immune system is the body's defense against microorganisms, helminths, and disease-causing cellular changes (such as cancer).
- The immune system is comprised of organs, cells (white blood cells, or leukocytes), and proteins that have specific functions.



https://blogs.stjude.org/progress/immunity-how-vaccinations-and-the-immune-system-protect-us.html

https://lpi.oregonstate.edu/sites/lpi.oregonstate.edu/files/lpi-immunity-infographic_1.pdf

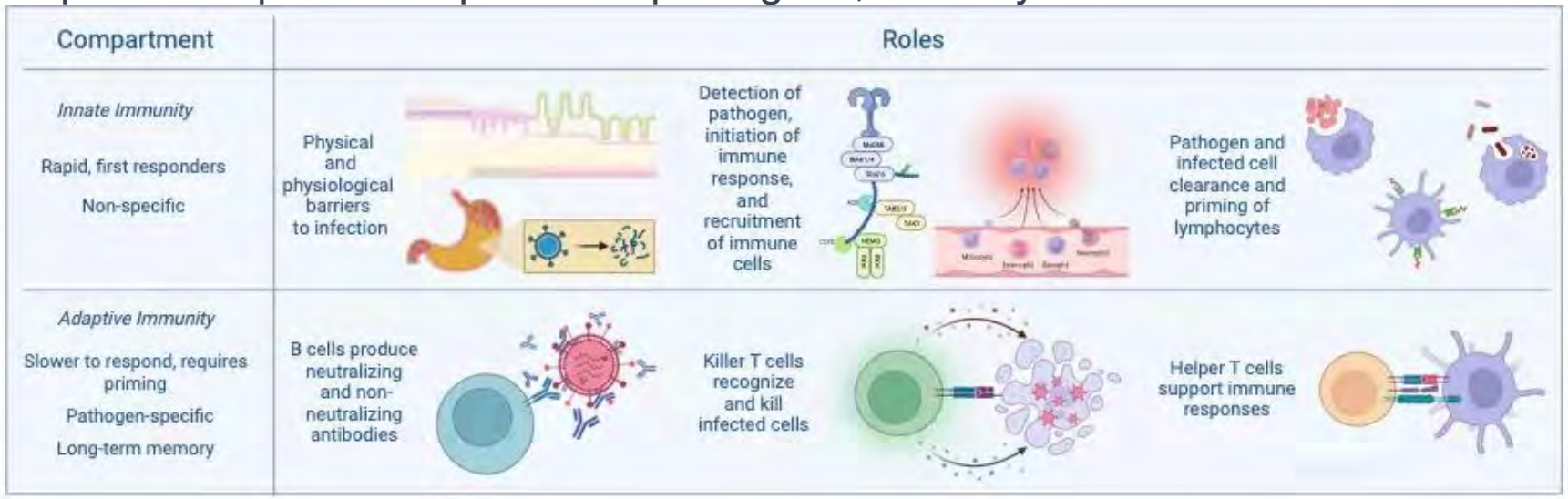
Innate and Adaptive Immune Systems

Innate Immune System – First line of defense

- Physical barriers (skin, mucous membranes)
- Cells: Macrophages, neutrophils, dendritic cells, natural killer cells
- Rapid response to pathogens, non-specific defense mechanisms, no memory function

Adaptive Immune System – System that adapts to specific pathogens.

- Cells: T cells (Helper T cells, Cytotoxic T cells), B cells
- Antibodies: Produced by B cells
- Specific responses to particular pathogens, memory function



https://blogs.stjude.org/progress/immunity-how-vaccinations-and-the-immune-system-protect-us.html

Functions of the Immune System

Defense

- Protects the body against pathogens.
  - Recognition and elimination of pathogens
  - Neutralization of toxins

Surveillance

- Constant monitoring for abnormal cells or pathogens.
  - Detection of mutated or infected cells
  - Targeted destruction of these abnormal cells

Homeostasis

- Maintaining the body's internal environment.
  - Regulation of immune responses
  - Balancing inflammation and immune reactions

Memory

- Ability to "remember" past encounters with pathogens.
  - Creation of memory cells for quicker responses upon reinfection
  - Basis for vaccinations and long-term immunity

Importance of Vaccines in Boosting Immune Response

Vaccines play a crucial role in strengthening the body's immune system to fight off infections.

- Prepare the immune system to recognize and combat specific pathogens.
- Reduce the severity and spread of infectious diseases within populations.

They do this by:

- Introducing weakened or killed pathogens or their parts to trigger an immune response.
- Prompting the production of memory cells for rapid response upon future exposure.

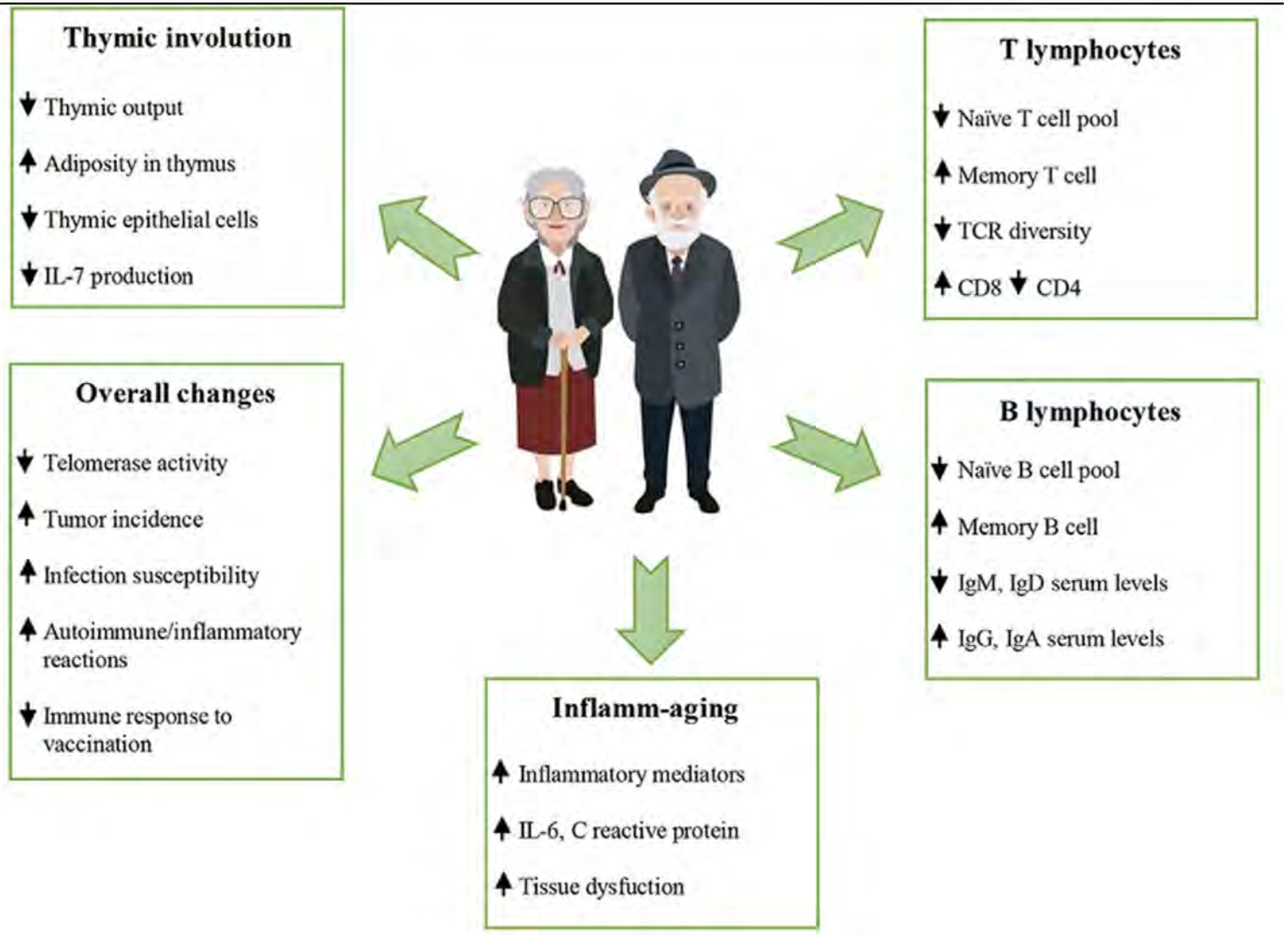
Vaccines train cells to prevent and clean up infectious pathogens via :

- **Humoral Response:** Antibodies produced to neutralize pathogens.
- **Cell-Mediated Response:** T cells targeting infected cells.
- **Boosting Protection:** Increasing the body's ability to fight off infections and reducing the likelihood of severe illness.

Impact of Aging on Immunity

- Aging significantly affects the immune system, leading to notable alterations in its function and response, including:
  - **Reduced Efficiency:** Diminished ability to recognize and combat pathogens.
  - **Immunosenescence:** Gradual decline in immune function, affecting both innate and adaptive immunity.
  - **Decreased Diversity:** Reduced repertoire and diversity of immune cells and receptors.
  - **Increased Susceptibility:** Higher vulnerability to infections and slower recovery.
  - **Weakened Response:** Decreased effectiveness of vaccinations and longer recovery periods.
- These changes result in greater susceptibility to diseases and cancer, slower wound healing, higher risk of autoimmune disorders, and impaired vaccine response.
- Understanding age-related immune changes is crucial in designing targeted interventions to support and bolster immunity in the elderly.

Immune System Changes with Aging



https://www.frontiersin.org/articles/10.3389/fimmu.2019.02247/full#F1

Immunosenescence in older people is characterized by:

- thymic involution,
- altered T and B cell responses,
- altered naïve/memory *ratio*,
- increased serum levels of IgG and IgA,
- chronic low-grade inflammation, and
- a poor response to newly encountered microbial antigens, **including vaccines.**

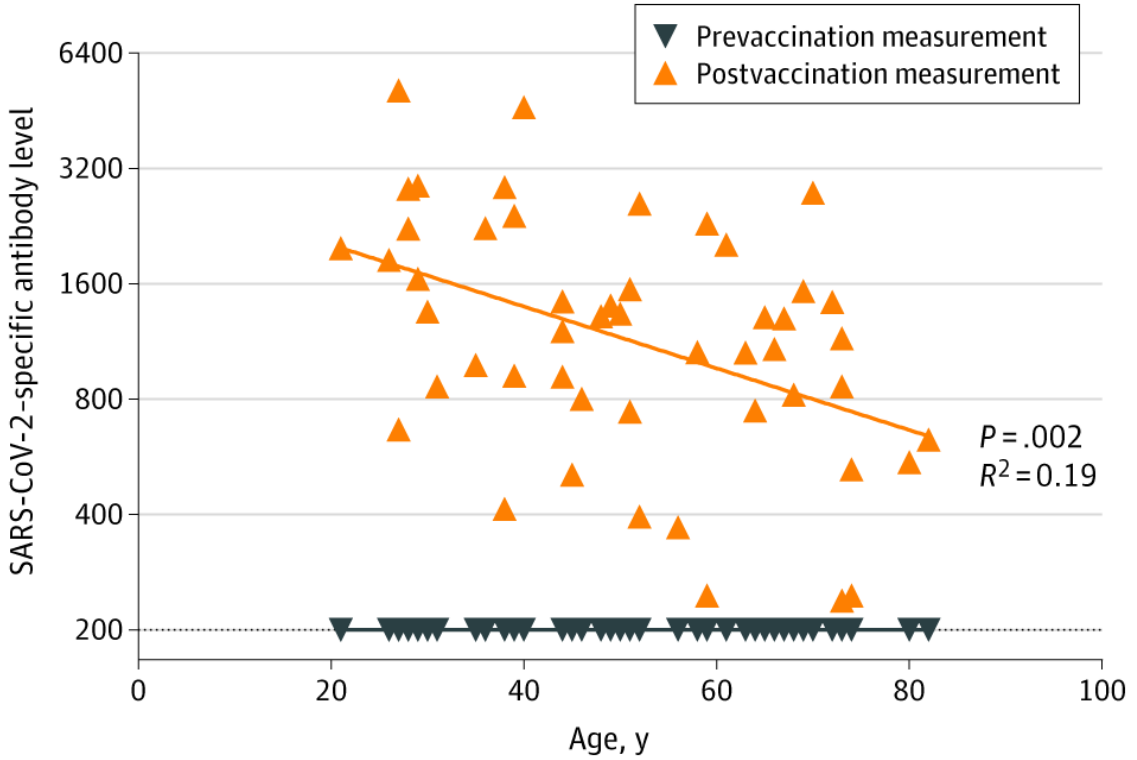
Hallmarks of immunosenescence include:

- reduced ability to respond to new antigens,
- accumulation of memory T cells, and
- lingering low-grade inflammation "inflamm-aging")

Vaccination in the Elderly: The Challenge of Immune Changes with Aging

Infections are one of the main causes of disease and/or death in people aged 65 and over. Unfortunately, older people frequently show impaired responses to vaccines.

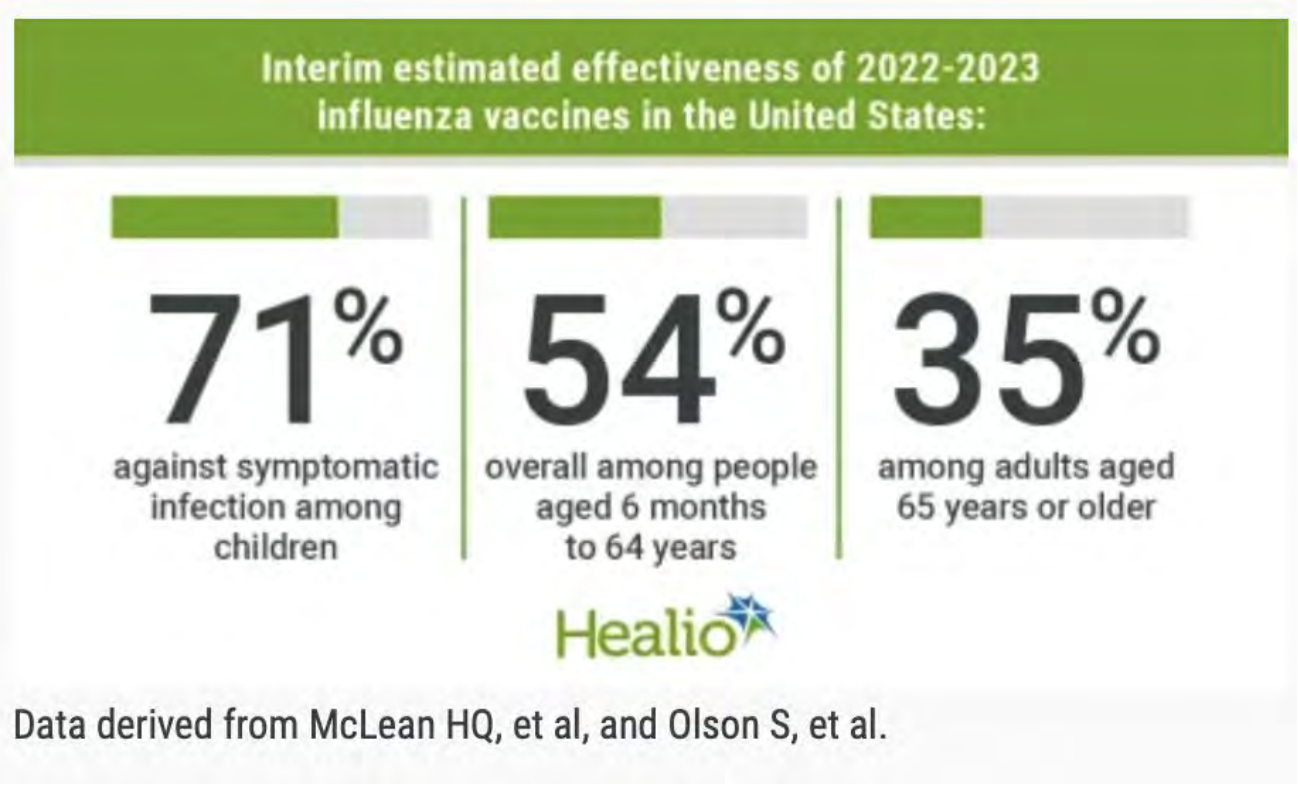
- The immune response of 50 people was measured two weeks after their second dose of the Pfizer vaccine against COVID-19.
- The youngest group (20-29 years) – had a nearly seven-fold increase in antibody response compared with the oldest group of people (70 and 82 years).
- Laboratory results reflected a clear linear progression from youngest to oldest:
- **The older a participant, the less robust the antibody response.**



https://news.ohsu.edu/2021/07/21/study-links-vaccine-immune-response-to-age

Bates TA, Leier HC, Lyski ZL, et al. Age-Dependent Neutralization of SARS-CoV-2 and P.1 Variant by Vaccine Immune Serum Samples. *JAMA.* 2021;326(9):868–869. doi:10.1001/jama.2021.11656

Older Adults at Higher Risk of Infection Despite Vaccination



- Older adults continue to be at increased risk of infection even after vaccination.
- Older people do not develop an adequate immune response against new pathogens or vaccines due to immunosenescence.
- Most vaccines are first tested in young or adult people, with an underrepresentation of the older population.
- Several approaches have been assessed for their efficacy in restoring immunity in older people, including
  - vaccines with higher doses of antigens,
  - different routes of administration, and
  - the use of new adjuvants.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9456428/#:~:text=Several%20approaches%20have%20been%20assessed,the%20use%20of%20new%20adjuvants.

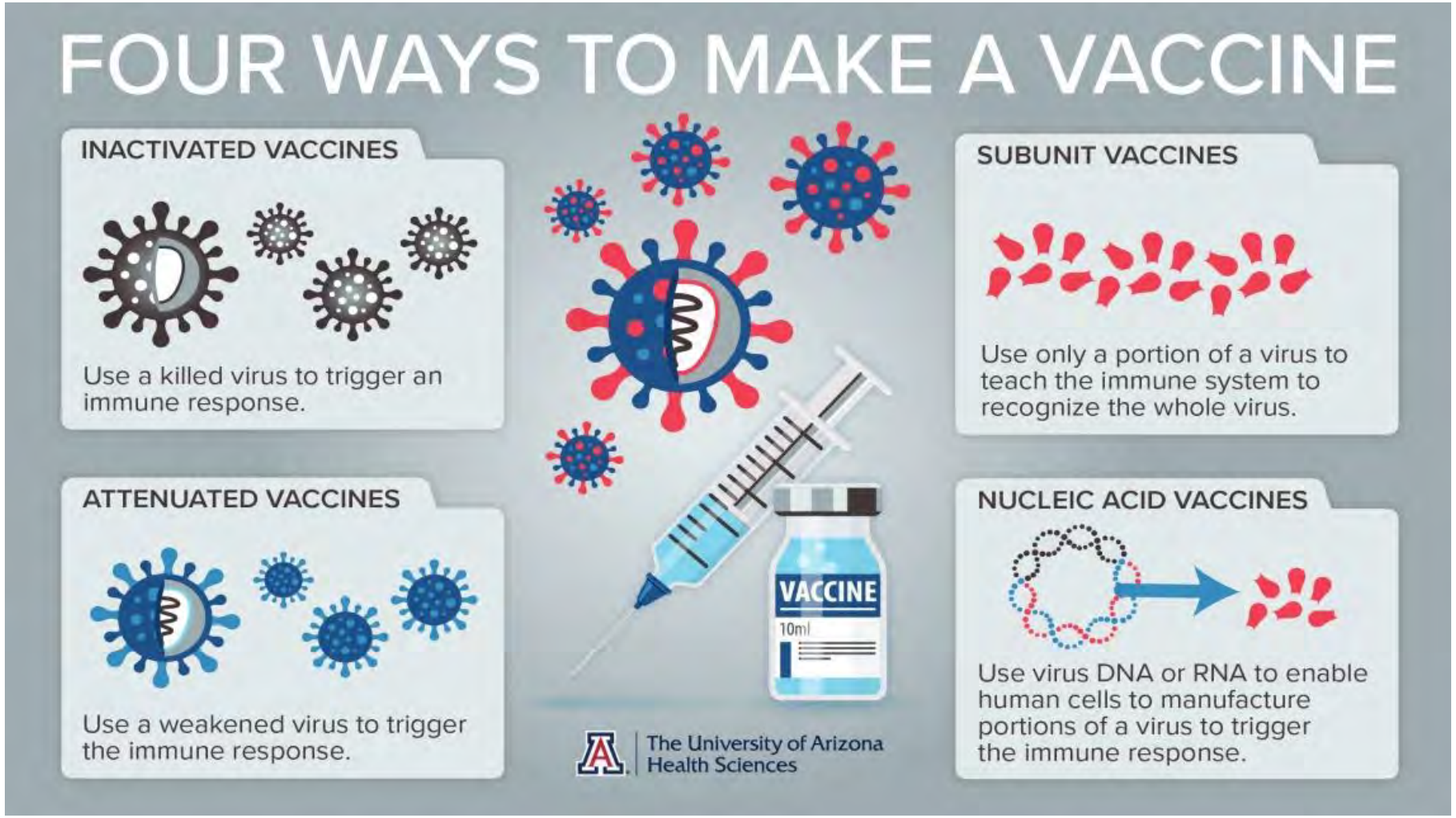
A Tale of Two Herpes Zoster Vaccines

GlaxoSmithKline	Merck
Non-live, recombinant subunit vaccine	Live-attenuated vaccine
Two IM injections at 0 and 2-6 months	Single subcutaneous injection
Recommended by ACIP for patients ≥ 50 years old	Recommended by ACIP for patients ≥ 60 years old
97% effective against shingles for people aged 50 - 69 91% effective against shingles for people ≥ 70 years old	51% effective against shingles
88% effective against PHN	67% effective against PHN

Table 1. Comparison of Herpes Zoster Vaccines

	Zostavax	*Shingrix*
Manufacturer	Merck	GSK
Type	Live-attenuated	Adjuvanted, recombinant subunit
Storage	Freezer[1]	Refrigerator
Dosage	0.65 mL SC x 1 dose[2]	0.5 mL IM x 2 doses (0, 2-6 months)[3]
Efficacy[4]:		
50-59 years	70%	97%
60-69 years	64%	97%
70-79 years	41%	91%
≥80 years	18%	91%
Cost[5]	$223.10	$280.00

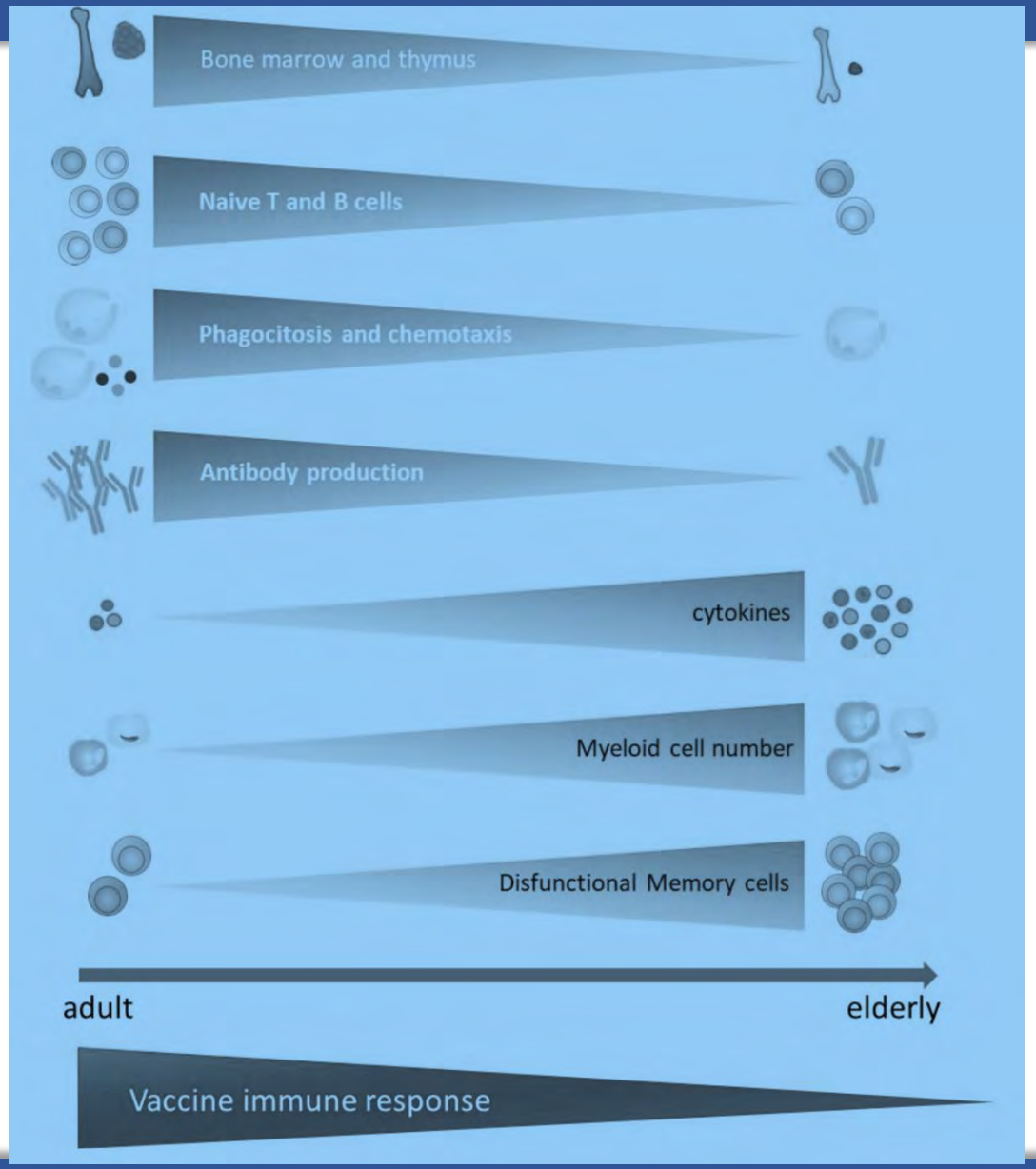
1. Can be stored in the refrigerator for up to 72 continuous hours prior to reconstitution. The diluent should be stored separately at room temperature.
2. Discard if not used within 30 minutes after reconstitution.
3. Use immediately after reconstitution or return to the refrigerator. Discard if not used within 6 hours after reconstitution.
4. Against herpes zoster. Pooled efficacy data for *Zostavax* from MN Oxman et al. N Engl J Med 2005; 352:22 (median follow-up 3.1 years) and KE Schmader et al. Clin Infect Dis 2012; 54:922 (median follow-up 1.3 years). Pooled efficacy data for *Shingrix* from H Lal et al. N Engl J Med 2015; 372:22 (median follow-up 3.1 years) and AL Cunningham et al. N Engl J Med 2016; 375:11 (median follow-up 3.9 years).
5. Approximate WAC for one dose of *Zostavax* or two doses of *Shingrix*. WAC = wholesaler acquisition cost or manufacturer's published price to wholesalers; WAC represents a published catalogue or list price and may not represent an actual transactional price. Source: AnalySource® Monthly. November 5, 2017. Reprinted with permission by First Databank, Inc. All rights reserved. ©2017. www.fdbhealth.com/policies/drug-pricing-policy.



https://healthsciences.arizona.edu/connect/stories/what-it-takes-create-vaccine

Strategies to Increase Vaccine Response in Older People

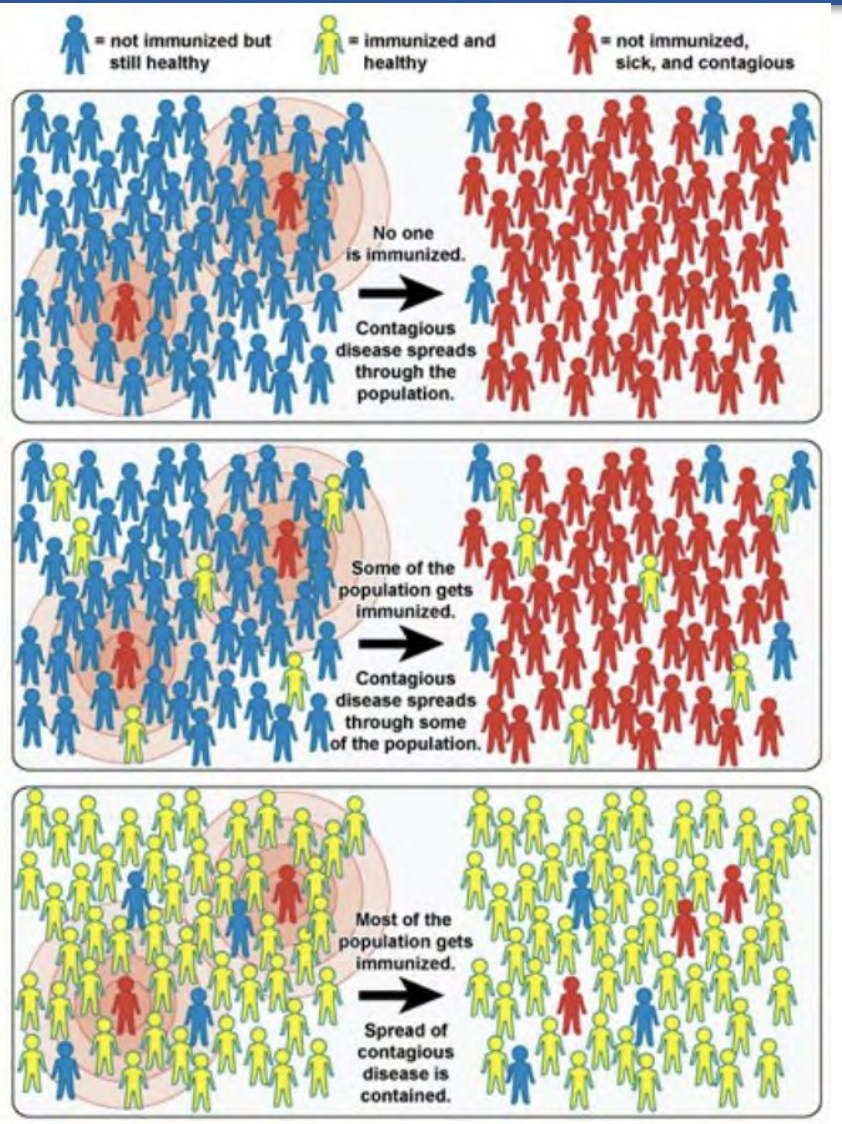
- Vaccine efficacy is strongly reduced in older people compared to younger adults.
- Need to design vaccines tailored for the elderly that consider immunosenescence and inflammaging.
- Adjuvants should be specifically designed for stimulating the aging immune system.
- Systems biology can contribute to identification of biomarkers and stratification of subpopulations for elderly vaccination.
- Immunobiography could guide vaccination strategies for specific elderly subpopulations.



https://www.sciencedirect.com/science/article/pii/S1044532318300678

The role of Community Immunity

- As more people develop immunity (vaccination or infection), the less likely a pathogen is to find a susceptible host.
- Older people and people who are immunocompromised have a decreased immune response to vaccine and aren't entirely safe just because they're vaccinated; the people around them need to be vaccinated as well.
- The more people vaccinated, the more protected the entire community.



https://www.pbs.org/wgbh/nova/article/herd-immunity/

What else decreases immune response?

1. Chronic Stress – elevations of stress hormones (e.g. cortisol) can suppress immune function
2. Poor Nutrition – diets lacking essential nutrients, vitamins, and minerals weaken immunity
3. Lack of Sleep - chronic sleep deprivation disrupts immune function
4. Excessive Alcohol Consumption – impairs cell function and disrupts natural immune defenses
5. Smoking and Substance Abuse – smoking damages immune system; both suppress immune function
6. Environmental Factors - exposure to pollutants, toxins, and certain chemicals can weaken the immune system over time
7. Chronic Diseases - diabetes, obesity, autoimmune disorders, and some cancers can compromise the immune system
8. Medications – medications (e.g. corticosteroids, chemotherapy) used to treat autoimmune conditions or certain cancers, can suppress the immune system as a side effect
9. Lack of Exercise – a sedentary lifestyle can weaken immune responses over time.
10. Excessive Antibiotic Use - Overuse or misuse of antibiotics can disrupt the balance of bacteria in the gut, affecting the immune system's ability to function properly.

A healthy lifestyle, managing stress, getting adequate sleep, eating a healthy diet, avoiding harmful substances, and managing chronic conditions can help support and strengthen the immune system.

The Important Role of Nutrition in Immune Function

OXIDATIVE BURST

- Certain immune cells produce a concentrated burst of reactive oxygen species (ROS), damaging substances that help kill invading organisms

Important nutrients

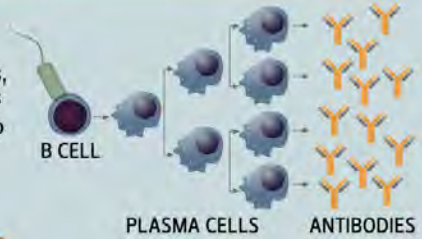
- Vitamin C
- Vitamin E
- Iron
- Zinc
- Copper
- Selenium

Connection

- Prolonged and continuous exposure to ROS can lead to damage and disease
- The listed antioxidant nutrients protect immune cells and keep the oxidative burst in check

PROLIFERATION

- Refers to an increase in the number or amount of something
- The immune system is constantly producing cells, chemicals, and proteins to carry out its functions
- When it encounters a foreign invader, it ramps up production to respond as needed



Important nutrients

- Vitamin A
- Vitamin D
- Folate
- Vitamin B_{12}
- Vitamin B_6
- Iron
- Zinc

Connection

- Proliferation requires energy, building blocks, and cofactors to produce the many cells and substances needed to mount an effective immune response
- The listed micronutrients have essential roles in the production and development of all new cells in the body, including immune cells

INFLAMMATION

- Isolates the injured or infected area
- Helps deliver immune cells, chemical messengers, and antibodies to sites of injury or infection

Important nutrients

- EPA
- DHA

Connection

- Inappropriate activation or the inability to turn off inflammation can lead to tissue damage and chronic disease
- EPA and DHA have anti-inflammatory activity that can help keep inflammation in check

https://lpi.oregonstate.edu/sites/lpi.oregonstate.edu/files/lpi-immunity-infographic_1.pdf

Questions?

The Big Well – located in Greensburg, KS

A Big Kansas Thank You!

The Big Well is the world's largest hand-dug well and the World's Largest Pallasite Meteorite. The Big Well was completed in 1886 as the town's original water supply, at 109 feet deep and 32 feet in diameter. Visitors can go down in the well and see exhibits about the history of Greensburg, the 2007 tornado, and the sustainability of Greensburg as it is to date.

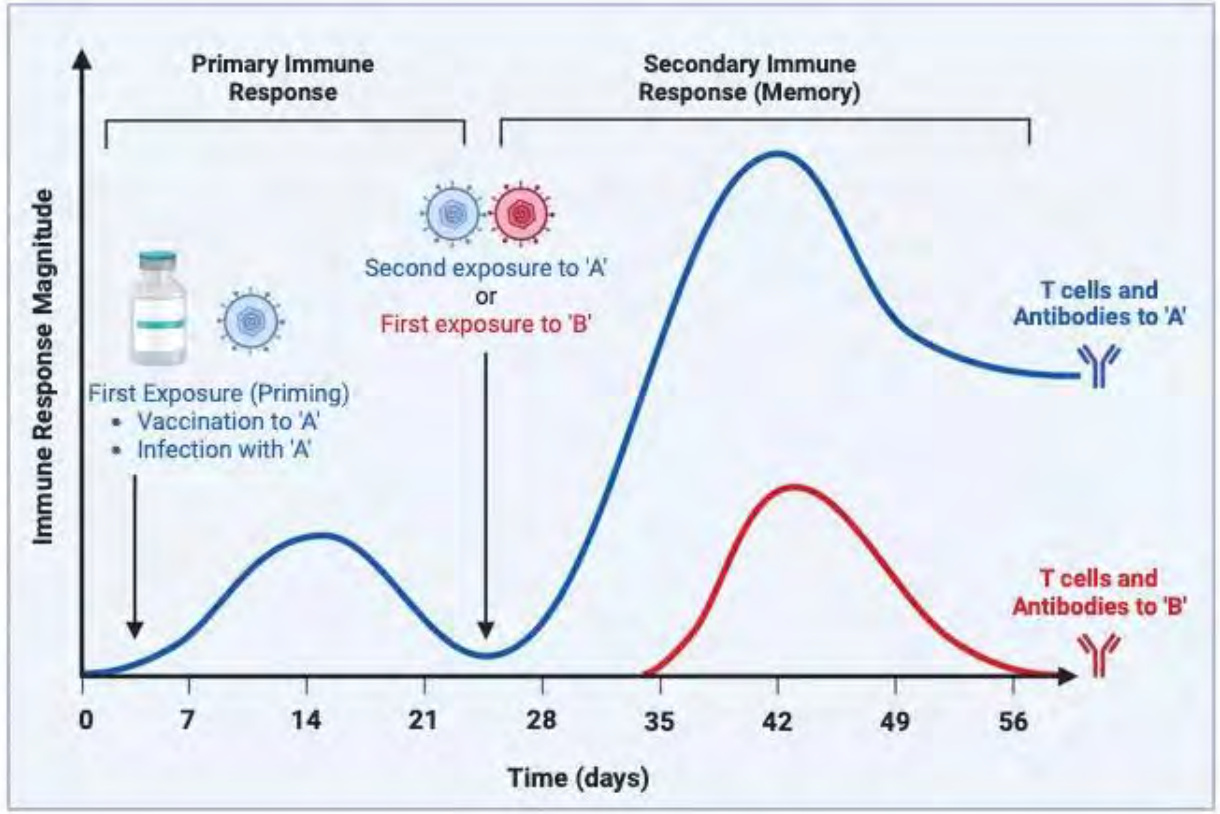
Joan Duwve, MD, MPH
State Health Officer

Joan.Duwve@ks.gov

Why do we need more than one dose of a vaccine?

Multiple vaccines are generally needed for three reasons:

- To meet a threshold of immune response that is required to protect against infection or severe illness.
- Memory immune responses naturally wane over time. Booster vaccines are intended to boost the memory immune response back to the threshold required for protection.
- Pathogens naturally change through multiple mechanisms, and this can result in a pathogen that looks different from the initial version, so much so that the immune system no longer recognizes it.



Critical Vaccines for Older Adults

Krissi O'Dell, RN BSN | December 15, 2023

Kansas Department of Health and Environment
Division of Public Health

Critical Vaccines for Older Adults

Learning Objectives:

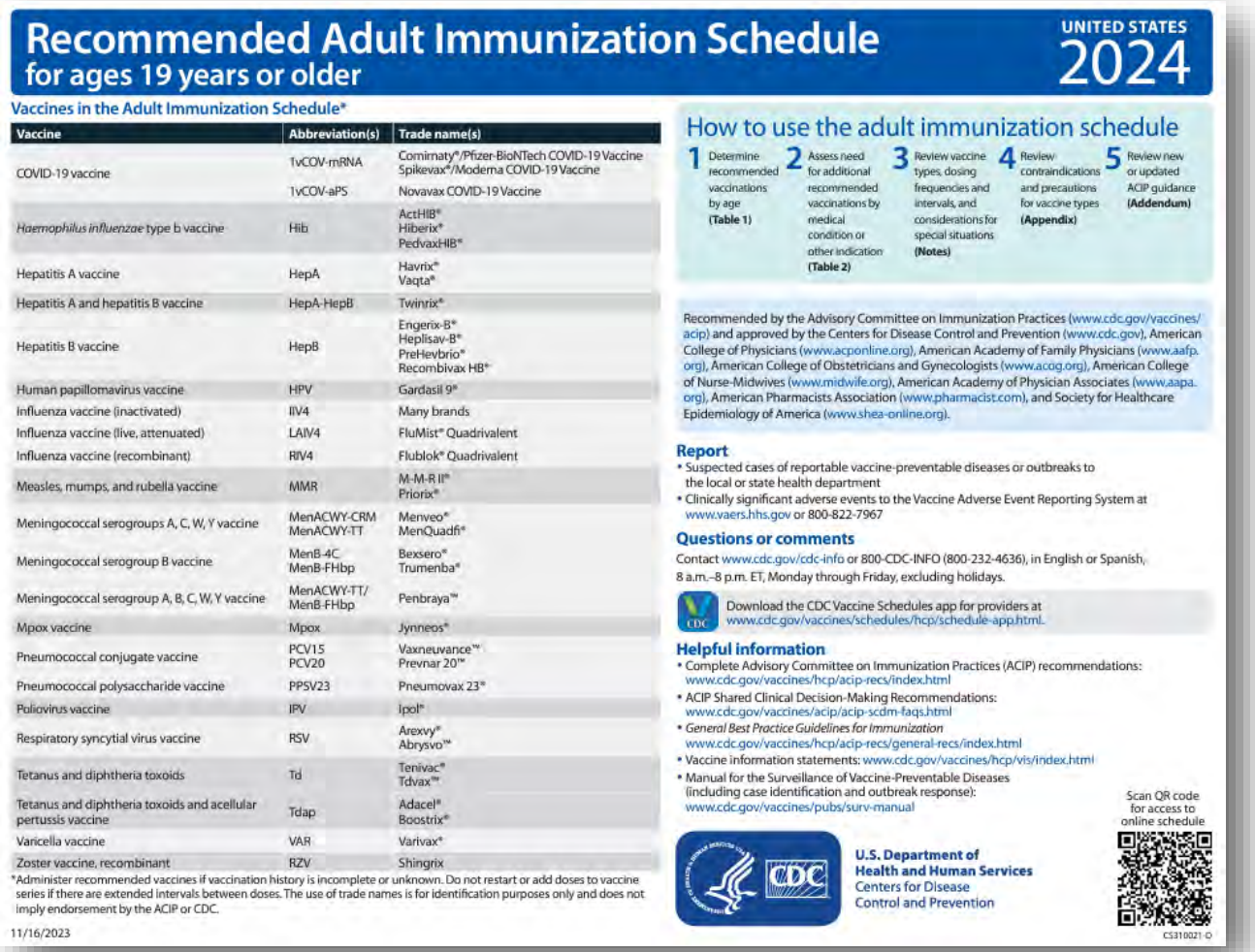
- Understand the vaccination schedule for adults.
- Identify what vaccines are needed in older adults.
- Describe those who are considered at-risk for certain diseases and need specific vaccinations.
- Identify resources for adult vaccinations.

Critical Vaccines for Older Adults

- Adults need to keep their vaccinations up to date because immunity from childhood vaccines can wear off over time.
- They are also at risk for different diseases as an adult.
- Vaccination is one of the most important and safest preventative care measures available.

Critical Vaccines for Older Adults

The Adult Immunization Schedule



Recommended Adult Immunization Schedule for ages 19 years or older

UNITED STATES 2024

Vaccines in the Adult Immunization Schedule*

Vaccine	Abbreviation(s)	Trade name(s)
COVID-19 vaccine	1vCOV-mRNA	Comirnaty®/Pfizer-BioNTech COVID-19 Vaccine Spikevax®/Moderna COVID-19 Vaccine
	1vCOV-aPS	Novavax COVID-19 Vaccine
Haemophilus influenzae type b vaccine	Hib	ActHIB® Hiberix® PedvaxHIB®
Hepatitis A vaccine	HepA	Havrix® Vaqta®
Hepatitis A and hepatitis B vaccine	HepA-HepB	Twinrix®
Hepatitis B vaccine	HepB	Engerix-B® Heplisav-B® PreHevbrio® Recombivax HB®
Human papillomavirus vaccine	HPV	Gardasil 9®
Influenza vaccine (inactivated)	IIV4	Many brands
Influenza vaccine (live, attenuated)	LAIV4	FluMist® Quadrivalent
Influenza vaccine (recombinant)	RIV4	Flublok® Quadrivalent
Measles, mumps, and rubella vaccine	MMR	M-M-R II® Priorix®
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-CRM MenACWY-TT	Menveo® MenQuadfi®
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero® Trumenba®
Meningococcal serogroup A, B, C, W, Y vaccine	MenACWY-TT/ MenB-FHbp	Penbraya™
Mpox vaccine	Mpox	Jynneos®
Pneumococcal conjugate vaccine	PCV15 PCV20	Vaxneuvance™ Prevnar 20™
Pneumococcal polysaccharide vaccine	PPSV23	Pneumovax 23®
Poliovirus vaccine	IPV	Ipol®
Respiratory syncytial virus vaccine	RSV	Arexvy® Abrysvo™
Tetanus and diphtheria toxoids	Td	Tenivac® Tdvax™
Tetanus and diphtheria toxoids and acellular pertussis vaccine	Tdap	Adacel® Boostrix®
Varicella vaccine	VAR	Varivax®
Zoster vaccine, recombinant	RZV	Shingrix

*Administer recommended vaccines if vaccination history is incomplete or unknown. Do not restart or add doses to vaccine series if there are extended intervals between doses. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.

11/16/2023

How to use the adult immunization schedule

1 Determine recommended vaccinations by age **(Table 1)**
2 Assess need for additional recommended vaccinations by medical condition or other indication **(Table 2)**
3 Review vaccine types, dosing frequencies and intervals, and considerations for special situations **(Notes)**
4 Review contraindications and precautions for vaccine types **(Appendix)**
5 Review new or updated ACIP guidance **(Addendum)**

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American College of Physicians (www.acponline.org), American Academy of Family Physicians (www.aafp.org), American College of Obstetricians and Gynecologists (www.acog.org), American College of Nurse-Midwives (www.midwife.org), American Academy of Physician Associates (www.aapa.org), American Pharmacists Association (www.pharmacist.com), and Society for Healthcare Epidemiology of America (www.shea-online.org).

Report
- Suspected cases of reportable vaccine-preventable diseases or outbreaks to the local or state health department
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or 800-822-7967

Questions or comments
Contact www.cdc.gov/cdc-info or 800-CDC-INFO (800-232-4636), in English or Spanish, 8 a.m.–8 p.m. ET, Monday through Friday, excluding holidays.

Download the CDC Vaccine Schedules app for providers at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html.

Helpful information
- Complete Advisory Committee on Immunization Practices (ACIP) recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- ACIP Shared Clinical Decision-Making Recommendations: www.cdc.gov/vaccines/acip/acip-scdm-faqs.html
- *General Best Practice Guidelines for Immunization* www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Vaccine information statements: www.cdc.gov/vaccines/hcp/vis/index.html
- Manual for the Surveillance of Vaccine-Preventable Diseases (including case identification and outbreak response): www.cdc.gov/vaccines/pubs/surv-manual

Scan QR code for access to online schedule

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CS310021-O

Sources: adult-combined-schedule.pdf (cdc.gov); Addendum Adult Immunization Schedule – Healthcare Providers | CDC

Pneumococcal Vaccines

- Pneumovax 23 (PPSV23)
- Vaxneuvance (PCV15)
- Prevnar20 (PCV20)

Sources: PneumoRecs VaxAdvisor: Vaccine Provider App | CDC

Pneumococcal Vaccine Schedule

Adults 65 and Older

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥1 year† → PPSV23
PPSV23 only at any age	≥1 year → PCV20	≥1 year → PCV15
PCV13 only at any age	≥1 year → PCV20	≥1 year† → PPSV23
PCV13 at any age & **PPSV23** at <65 yrs	≥5 years → PCV20	≥5 years§ → PPSV23

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
† Consider minimum interval (8 weeks) for adults with an immunocompromising condition, cochlear implant, or cerebrospinal fluid leak (CSF) leak
§ For adults with an immunocompromising condition, cochlear implant, or CSF leak, the minimum interval for PPSV23 is ≥8 weeks since last PCV13 dose and ≥5 years since last PPSV23 dose; for others, the minimum interval for PPSV23 is ≥1 year since last PCV13 dose and ≥5 years since last PPSV23 dose

Shared clinical decision-making for those who already completed the series with PCV13 and PPSV23

Prior vaccines	Shared clinical decision-making option
Complete series: PCV13 at any age & **PPSV23** at ≥65 yrs	≥5 years → PCV20 — Together, with the patient, vaccine providers **may choose** to administer PCV20 to adults ≥65 years old who have already received PCV13 (but not PCV15 or PCV20) at any age and PPSV23 at or after the age of 65 years old.

Pneumococcal Vaccine Schedule

Schedule for Immunocompromised Adults

Adults 19–64 years old with specified immunocompromising conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥8 weeks → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13 only	≥1 year → PCV20	≥8 weeks → PPSV23 → ≥5 years → PPSV23 Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13 and 1 dose of PPSV23	≥5 years → PCV20	≥5 years† → PPSV23 Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13 and 2 doses of PPSV23	≥5 years → PCV20	**No vaccines** recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
Immunocompromising conditions	• Chronic renal failure • Congenital or acquired asplenia • Congenital or acquired immunodeficiency§ • Generalized malignancy • HIV infection • Hodgkin disease • Iatrogenic immunosuppression¶ • Leukemia • Lymphoma • Multiple myeloma • Nephrotic syndrome • Sickle cell disease/other hemoglobinopathies • Solid organ transplant	

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
† The minimum interval for PPSV23 is ≥8 weeks since last PCV13 dose and ≥5 years since last PPSV23 dose
§ Includes B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease)
¶ Includes diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy

Pneumococcal Vaccine Schedule

Adults 19-64 with CSF leak or cochlear implant

Adults 19–64 years old with a cochlear implant or cerebrospinal fluid leak
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥8 weeks → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13 only	≥1 year → PCV20	≥8 weeks → PPSV23 Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13 and 1 dose of PPSV23	≥5 years → PCV20	**No vaccines** recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 years old.

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines

Pneumococcal Vaccine Schedule

Adults 19-64 with chronic health conditions

Adults 19–64 years old with chronic health conditions
Complete pneumococcal vaccine schedules

Prior vaccines	Option A	Option B
None*	PCV20	PCV15 → ≥1 year → PPSV23
PPSV23 only	≥1 year → PCV20	≥1 year → PCV15
PCV13† only	≥1 year → PCV20	≥1 year → PPSV23 Review pneumococcal vaccine recommendations again when your patient turns 65 years old.
PCV13† and PPSV23	**No vaccines** are recommended at this time. Review pneumococcal vaccine recommendations again when your patient turns 65 years old.	
Chronic health conditions	• Alcoholism • Chronic heart disease, including congestive heart failure and cardiomyopathies • Chronic liver disease	• Chronic lung disease, including chronic obstructive pulmonary disease, emphysema, and asthma • Cigarette smoking • Diabetes mellitus

* Also applies to people who received PCV7 at any age and no other pneumococcal vaccines
† Adults with chronic medical conditions were previously not recommended to receive PCV13

Shingles

Shingrix (Recombinant Zoster Vaccine RZV)

Adults 50 years and older should receive two doses of Shingrix, including those:

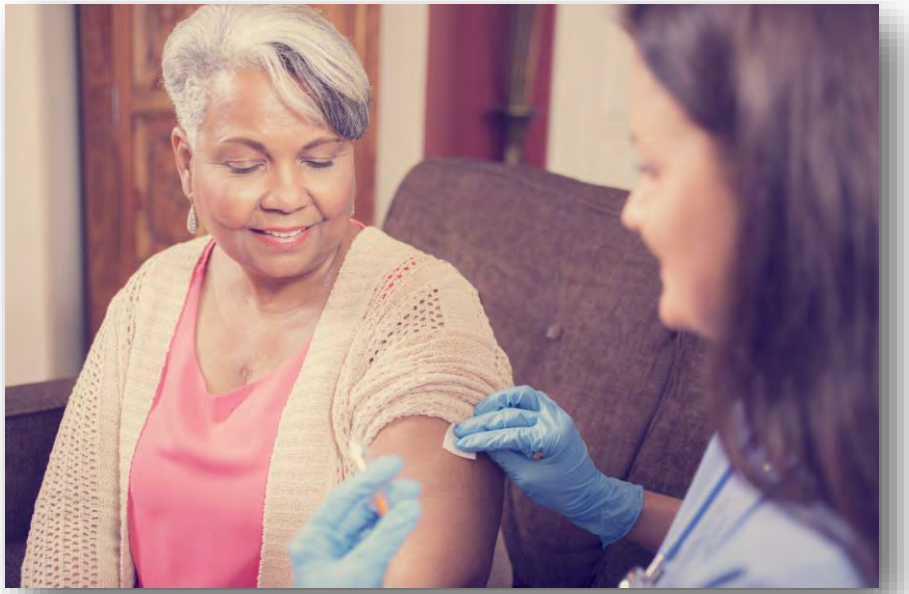
- Had shingles in the past
- Received Zostavax (Zoster Vaccine Live) at least 8 weeks prior
- Have health conditions such as chronic renal failure, diabetes mellitus, rheumatoid arthritis, or chronic pulmonary disease
- Are receiving other vaccines such as influenza and pneumococcal vaccines, at the same visit
- Are taking *low-dose* immunosuppressive therapy

Give the second dose two to six months after the first.

RSV

Arexvy (RSVPreF3)

Abrysvo (RSVpreF)



Age 60 years and older

- Single dose before the onset of the fall and winter RSV season
- Provides protection for at least 2 RSV seasons.

Influenza Vaccine Schedule

Age 19 years or older: One dose any influenza vaccine appropriate for age and health status annually.

Age 65 years or older: Any one of quadrivalent high-dose inactivated influenza vaccine (HD-IIV4), quadrivalent recombinant influenza vaccine (RIV4), or quadrivalent adjuvanted inactivated influenza vaccine (aIIV4) is preferred. If none of these three vaccines are available, then any other age-appropriate influenza vaccine should be used.

Influenza Vaccine

Influenza

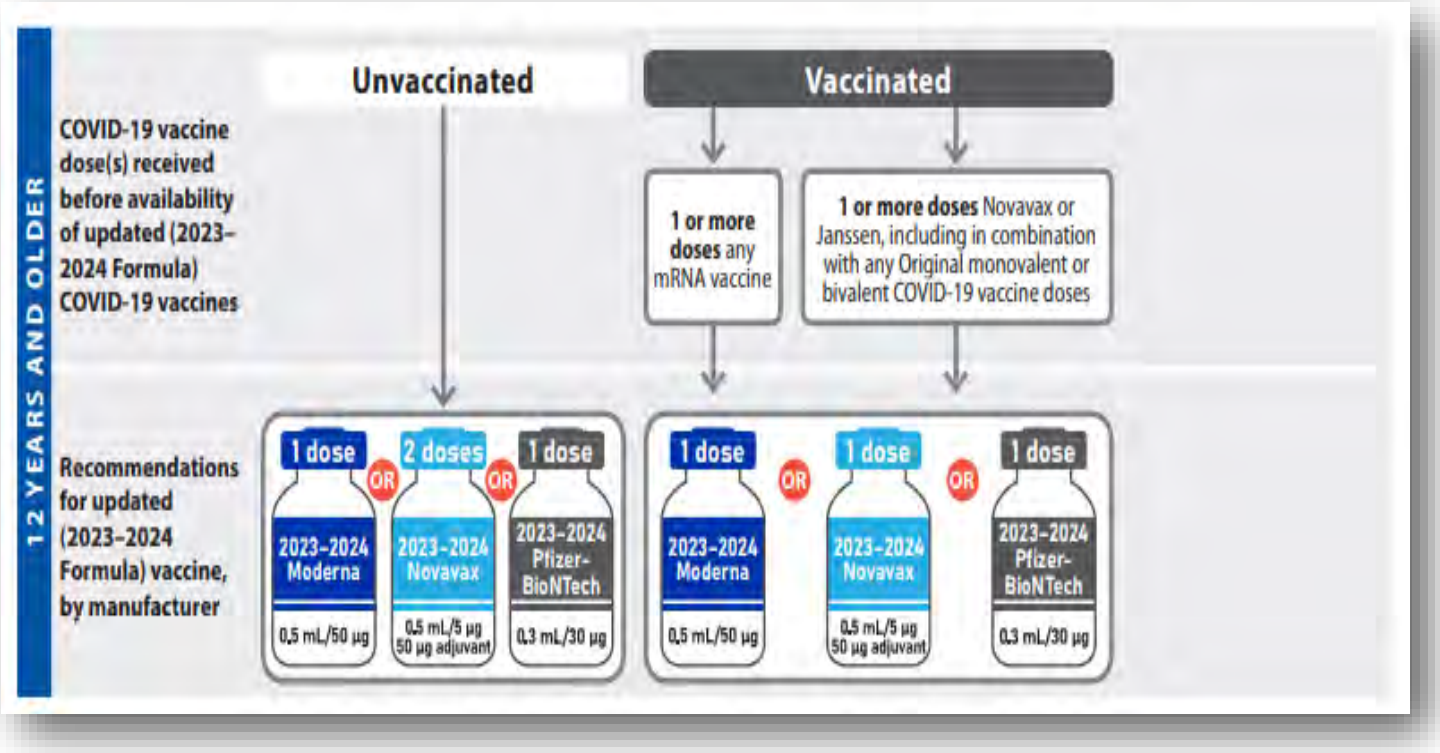
- **Influenza, inactivated (IIV4)**
  - **Fluzone** (Sanofi)
  - **FluLaval** (GlaxoSmithKline)
  - **Flucelvax** (Seqirus)
  - **Fluarix** (GlaxoSmithKline)
  - **Afluria** (Seqirus)
- **Influenza, inactivated, high-dose (IIV4-HD)**
  - **Fluzone High-Dose** (Sanofi)
  - **Fluad** (Seqirus)
- **Influenza, recombinant (RIV4)**
  - **Flublok** (Sanofi)
- **Influenza, live attenuated (LAIV4) Intranasal spray**
  - **FluMist** (Medimmune)

COVID-19

Moderna/Spikevax

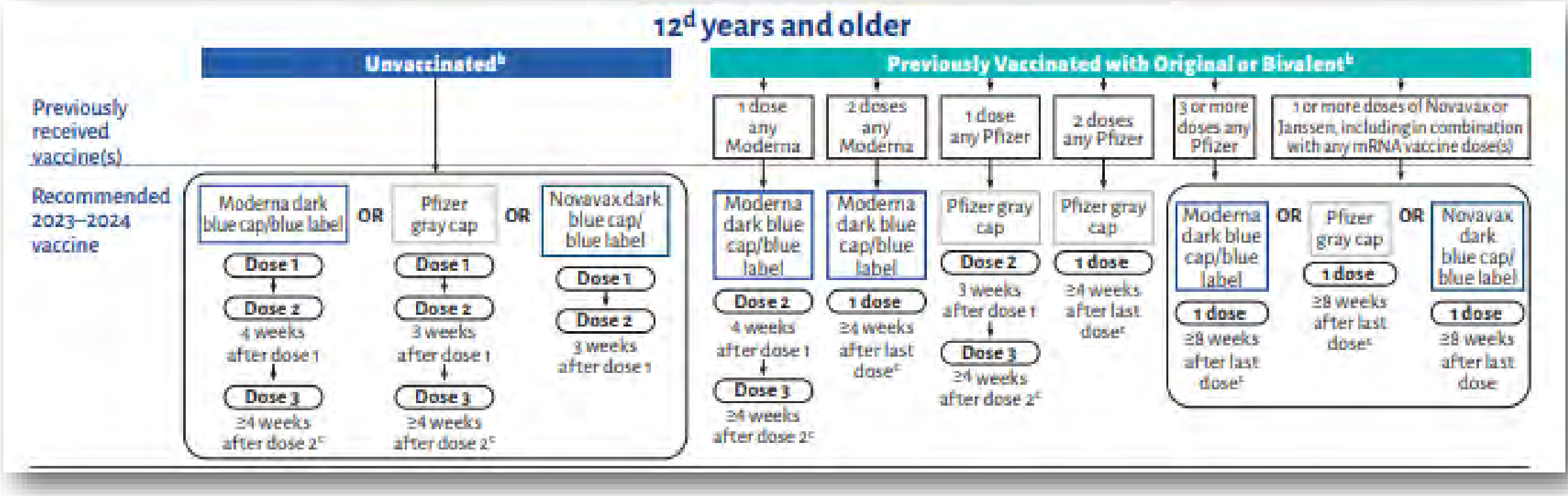
Pfizer-BioNTech/Comirnaty

Novavax



Source: [COVID Vaccine Dosing_Quick Reference.pdf (aap.org)]

Moderately to Severely Immunocompromised



Source: [COVID Vaccine Dosing_Quick Reference.pdf (aap.org)]

Other Adult Vaccines

Tetanus, Diphtheria, Pertussis (Td or TDaP)

Mpox

Hepatitis A

Hepatitis B

Tetanus, Diphtheria (Td) with Pertussis (Tdap)

- Tenivac (Td)
- Generic Tetanus, Diphtheria (Td)
- Boostrix (Tdap)
- Adacel (Tdap)

Td or Tdap Schedule

Previously did not receive Tdap at or after age 11 years: 1 dose Tdap, then Td or Tdap every 10 years.

Previously did not receive primary vaccination series for tetanus, diphtheria, or pertussis: 1 dose Tdap followed by 1 dose Td or Tdap at least 4 weeks later, and a third dose of Td or Tdap 6-12 months later (Tdap can be substituted for any Td dose, but preferred as first dose), Td or Tdap every 10 years thereafter.

Pregnancy: 1 dose Tdap during each pregnancy, preferably in early part of gestational weeks 27-36.

Jynneos Vaccine

- Prioritized for people who are **high risk** for severe disease
- Two doses, four-weeks apart
- Can be given as post-exposure prophylaxis (PEP) both to people with known or presumed exposure to Mpox virus.

Hepatitis A

Havrix

Vaqta

Hepatitis A vaccines: Recommended dosages and schedules

VACCINE	AGE GROUP	VOLUME	# DOSES	DOSING INTERVALS
Havrix (GlaxoSmithKline)	1[1] through 18 yrs	0.5 mL	2	0, 6–12 mos
	19 yrs and older	1.0 mL	2	0, 6–12 mos
Vaqta (Merck)	1[1] through 18 yrs	0.5 mL	2	0, 6–18 mos
	19 yrs and older	1.0 mL	2	0, 6–18 mos

Age 19 years and older:

- Two dose series *(Havrix 6-12 months apart or Vaqta 6-18 months apart; minimum interval 6 months).*

Hepatitis B

Engerix-B

Recombivax HB

Heplisav-B

PreHevbrio

Hepatitis B vaccines: Recommended dosages and schedules

VACCINE	AGE GROUP	VOLUME	# DOSES	SCHEDULES/DOSING INTERVALS
Engerix-B (GlaxoSmithKline)	0 through 19 yrs	0.5 mL	3	For newborns, give dose #1 within 24 hrs of birth; then at age 1–2 mos and 6–18 mos For older children who did not start HepB series at birth: 0, 1–2, 4–6 mos[2]
	20 yrs and older	1.0 mL[3]	3	0, 1–2, 4–6 mos[2]
Recombivax HB (Merck)	0 through 19 yrs	0.5 mL	3	For newborns, give dose #1 within 24 hrs of birth; then at age 1–2 mos and 6–18 mos For older children who did not start HepB series at birth: 0, 1–2, 4–6 mos[2]
	11 through 15 yrs	1.0 mL	2	0, 4–6 mos
	20 yrs and older	1.0 mL[3]	3	0, 1–2, 4–6 mos[2]
Heplisav-B (Dynavax)	18 yrs and older	0.5 mL[3]	2	0, 1 mo
PreHevbrio (VBI Vaccines)	18 yrs and older	1.0 mL[3]	3	0, 1, 6 mos

Hepatitis B

- **Age 19 through 59 years**:
  - Two dose series only apply when two doses of Heplisav-B are used at least four-weeks apart
  - Three dose series Engerix-B, PreHevbrio, or Recombivax HB at 0,1, and 6 *months (***minimum intervals***:* **dose 1 to dose 2 = 4 weeks/dose 2 to dose 3 = 8 weeks/dose 1 to dose 3 = 16 weeks***)*

- **Age 60 years or older with known risk factors** for hepatitis B **should** complete a HepB vaccine series.

- **Age 60 years or older without known risk** factors **may** complete a HepB vaccine series.

References

PneumoRecs VaxAdvisor: Vaccine Provider App | CDC

Immunization Schedules | CDC

Recommended Adult Immunization Schedule for ages 19 years or older, United States, 2024 (cdc.gov)

COVID Vaccine Dosing_Quick Reference.pdf (aap.org)

Pneumococcal Vaccine Timing for Adults greater than or equal to 65 years (cdc.gov)

Thank you! Questions?

Krissi O'Dell, RN BSN
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Panelists

Other Voices in Immunizations for Healthy Aging

Annette Graham, LSCSW

Executive Director, Central Plains AAA

Brenda Rhoads-Groves, LPN, CADDCT

Quality Improvement Consultant, KFMC Health Improvement Partners

Lacey Hunter

Commissioner of Survey, Certification & Credentialing, KDADS

Amanda Applegate, PharmD, BCACP

Director of Practice Development, KPA

Patricia Torres

Community Health Specialist, Immunize Kansas Coalition

Case Presentation

Older adult, age 70+ living in a rural Kansas county

- Received COVID-19 booster
  - Delayed due to availability of any vaccine in our area
  - Forced to switch brands because previous brand no longer available in area
  - No adverse reactions from the brand change
- Received influenza vaccine at the same time
- Declined the RSV and Shingles vaccines
  - For RSV, concerned about their chronic health conditions and local environment
  - For Shingles, considering it now that insurance will pay for it

Case Questions Posed

1. How would you advise this person as they make decisions about getting the RSV and Shingles vaccines?
2. How much of an obstacle is coverage in accessing vaccinations like RSV and Shingles, and what causes this barrier?
3. How can the state, pharmacists and community organizations ensure adequate supply of immunizations for the population's needs?

Closing Remarks

John Eplee, M.D.

- Family Physician
- Kansas Legislative Representative

Announcements

Future Sessions

Immunizations for Maternal Health
Friday, Feb. 16, 2024, from 11 a.m. -12:30 p.m.

Access to Immunizations for Uninsured Adults
Friday, March 22, 2024, from 10-11:30 a.m.

Vaccine Coverage Gap
Date TBD

For more information, visit Ad Astra ECHO Series: Immunizations in Kansas

Acknowledgments

Nurture KC

LAWRENCE Public Schools

Kansas Department of Health and Environment

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