Vaccines for Solid Organ Transplant Recipients: Navigating the Current Climate

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Objectives:

- Discuss why vaccines are essential for this unique population
- Summarize understanding of vaccine strategies in the context of transplantation
- Review the recommended vaccines
- Describe how the current political climate is impacting the development of vaccine hesitancy

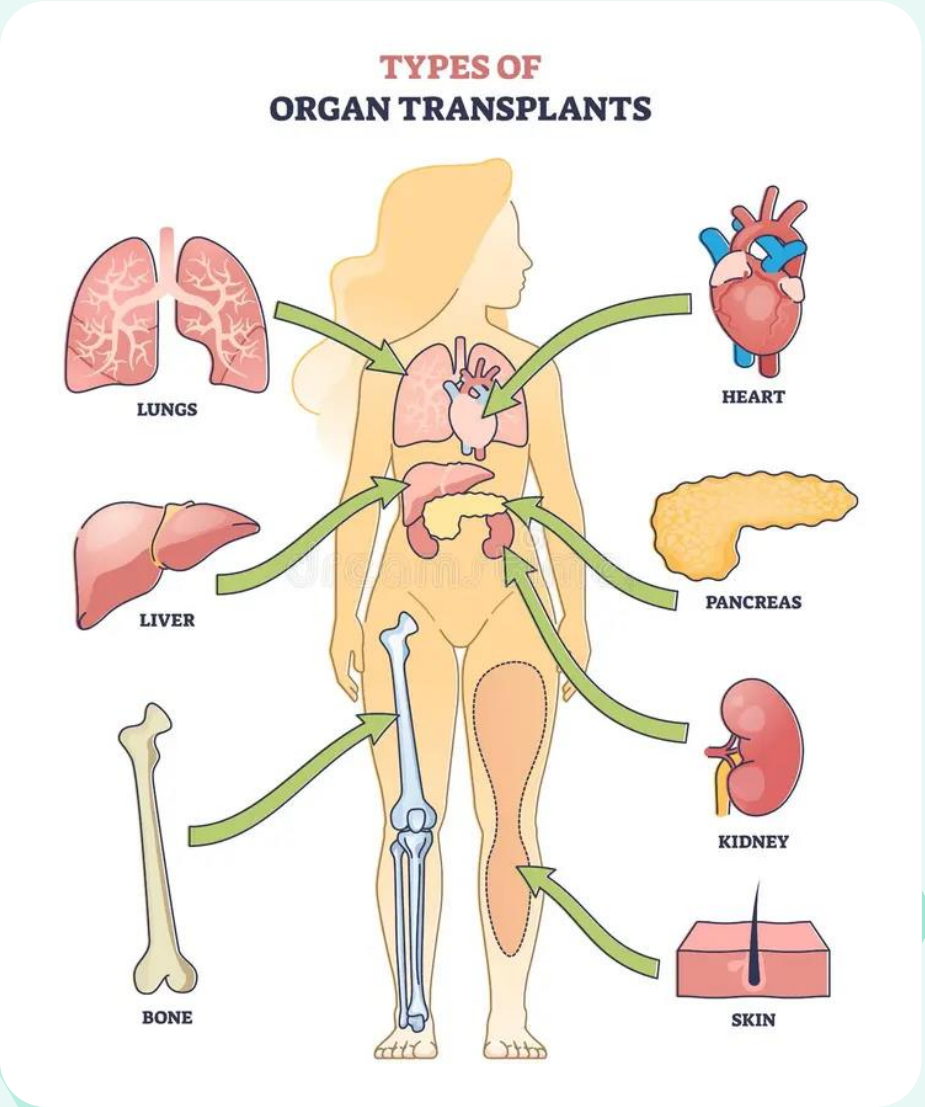
Understanding Solid Organ Transplantation

- Solid organ transplantation involves replacing a diseased or damaged organ with a healthy one from a donor

- Common transplants include:
  - **Kidney**
  - **Liver**
  - **Heart**
  - **Lung**
  - **Pancreas/Small bowel**

- **Immunosuppression** is crucial post-transplant to prevent the recipient's immune system from rejecting the new organ
    - This suppression, however, creates increased susceptibility to infections

- Infection carries significant morbidity and mortality in transplant recipients
    - Antibiotic therapies are less effective in transplant recipients than in non-transplant hosts



Immunosuppression: A Double-Edged Sword

Immunosuppressive medications are vital for preventing organ rejection

- These drugs weaken the immune system, reducing its ability to attack the transplanted organ
    - Global weakening of the immune system
        - Increases the risk of opportunistic infections and vaccine-preventable diseases

The challenge: Balancing immunosuppression to protect the organ while maintaining sufficient immune function to fight infections

Factors that can contribute to one's "Net State of Immunosuppression"

- Immunosuppressive medications (dose, duration, regimen)
- Underlying illnesses/comorbidities
- Age

Vaccine Recommendations for Transplant Recipients

Vaccinate **before** transplantation whenever possible

Recommended vaccines include:

- **Pneumococcal** (PCV20 and PPSV23)
- **Hepatitis B**
- **Hepatitis A**
- **Varicella**
- **MMR**
- Annual **Influenza** vaccine (inactivated)
- **Tdap** (Tetanus, Diphtheria, Pertussis)
- **COVID-19**
- **Human papilloma virus** (HPV)
- **Respiratory syncytial virus** (RSV)

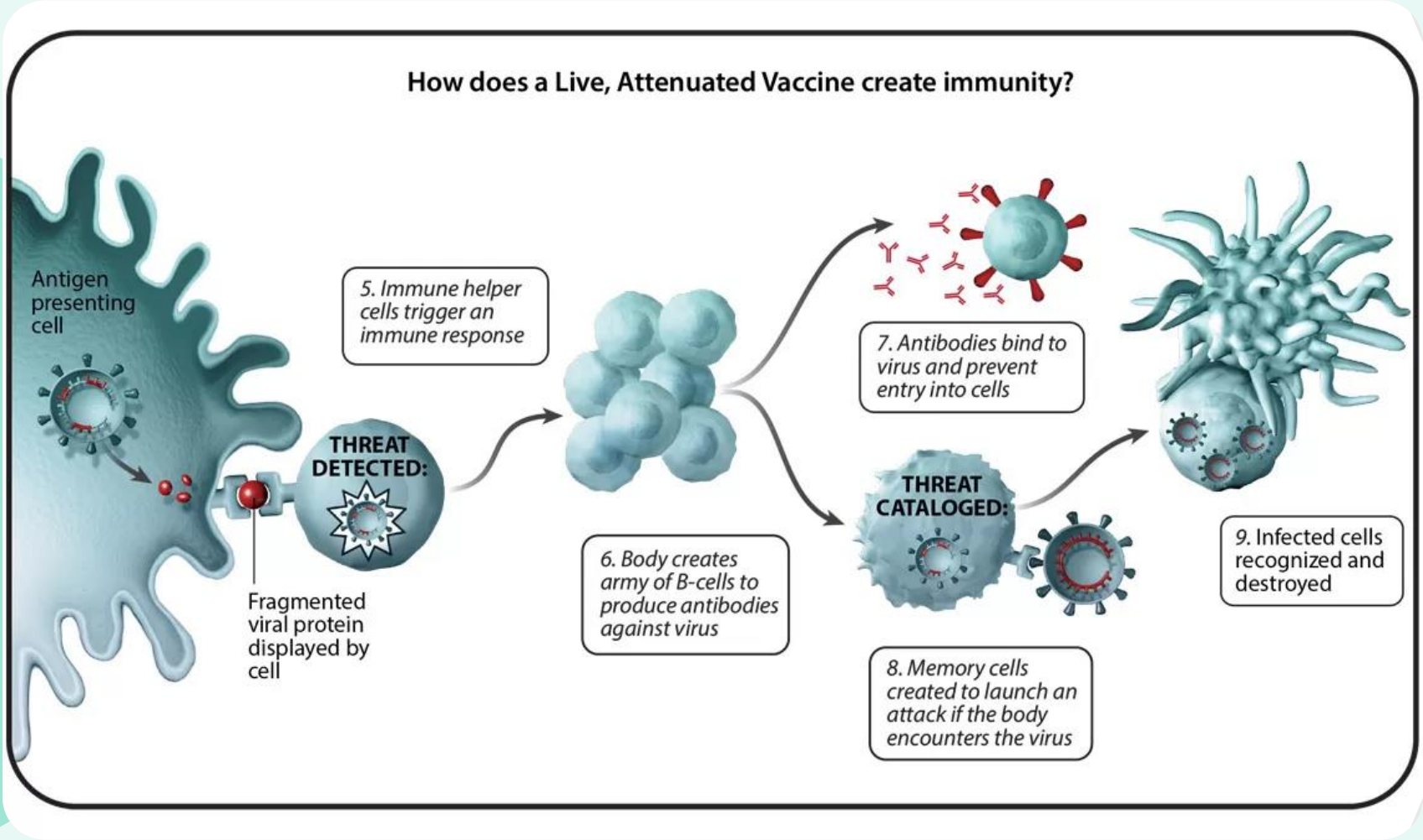
- Certain scenarios also require **Meningococcus** vaccines

- Age will factor into whether or not you get all of the above vaccines:
  - ≤ 45yrs old, HPV
  - ≥ 50 yrs old, RSV

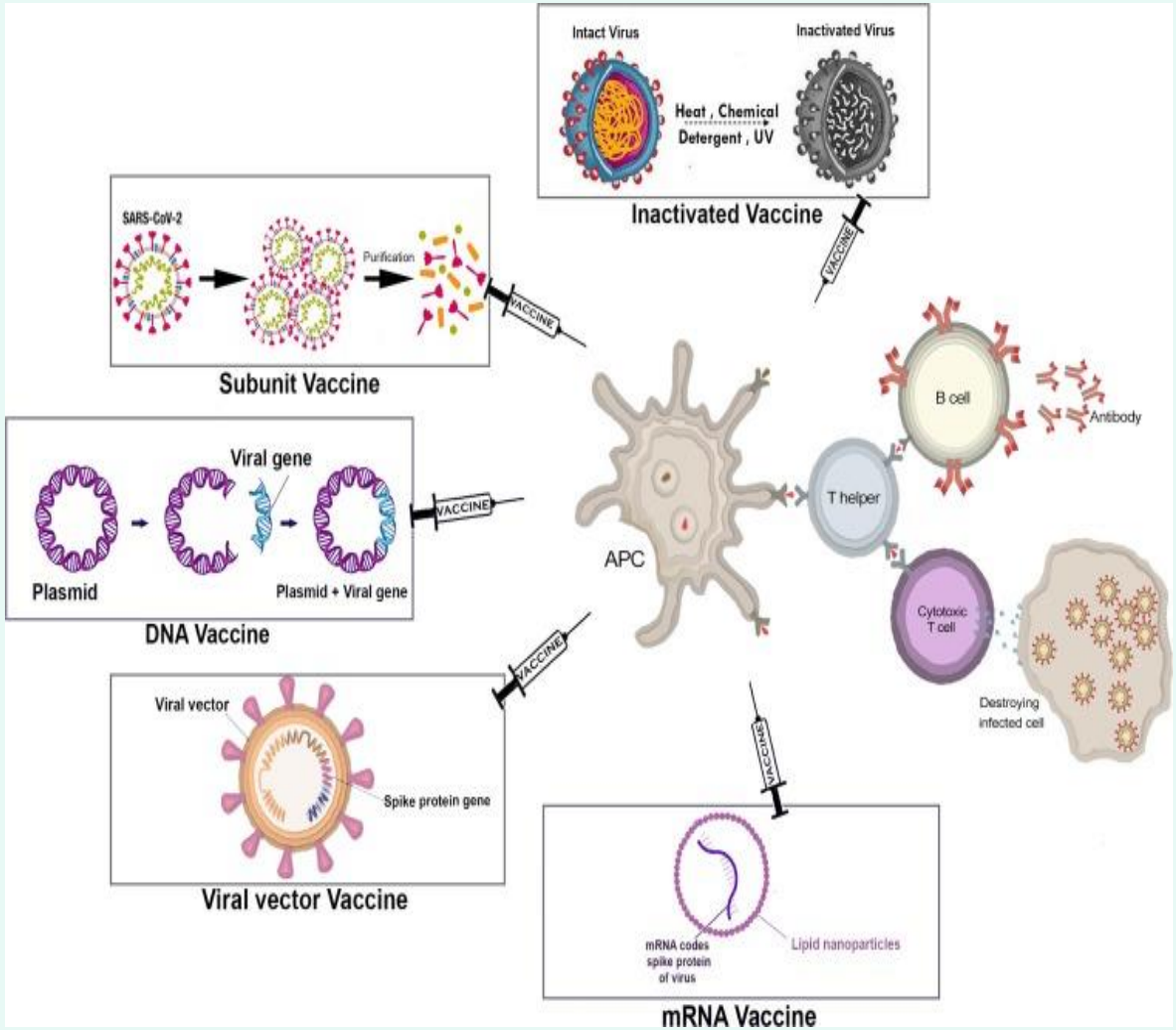
Live Attenuated Vaccines: Risks and Benefits

Live attenuated vaccines contain weakened versions of the infectious agent

- Generally **contraindicated** in transplant recipients due to the risk of causing infection
- Examples: MMR (Measles, Mumps, Rubella), Varicella (Chickenpox), Oral Polio Vaccine, other travel-related vaccines



Inactivated Vaccines: Safety and Efficacy



Inactivated vaccines contain killed infectious agents or parts of them

- Generally **safe** for transplant recipients
- Efficacy may be reduced due to immunosuppression

Examples:
Influenza (injection)
Pneumococcal
Hepatitis B
Tdap (Tetanus, Diphtheria, Pertussis)

Higher doses or more frequent boosters might be necessary to achieve adequate protection
Example: COVID-19 booster every 6 months

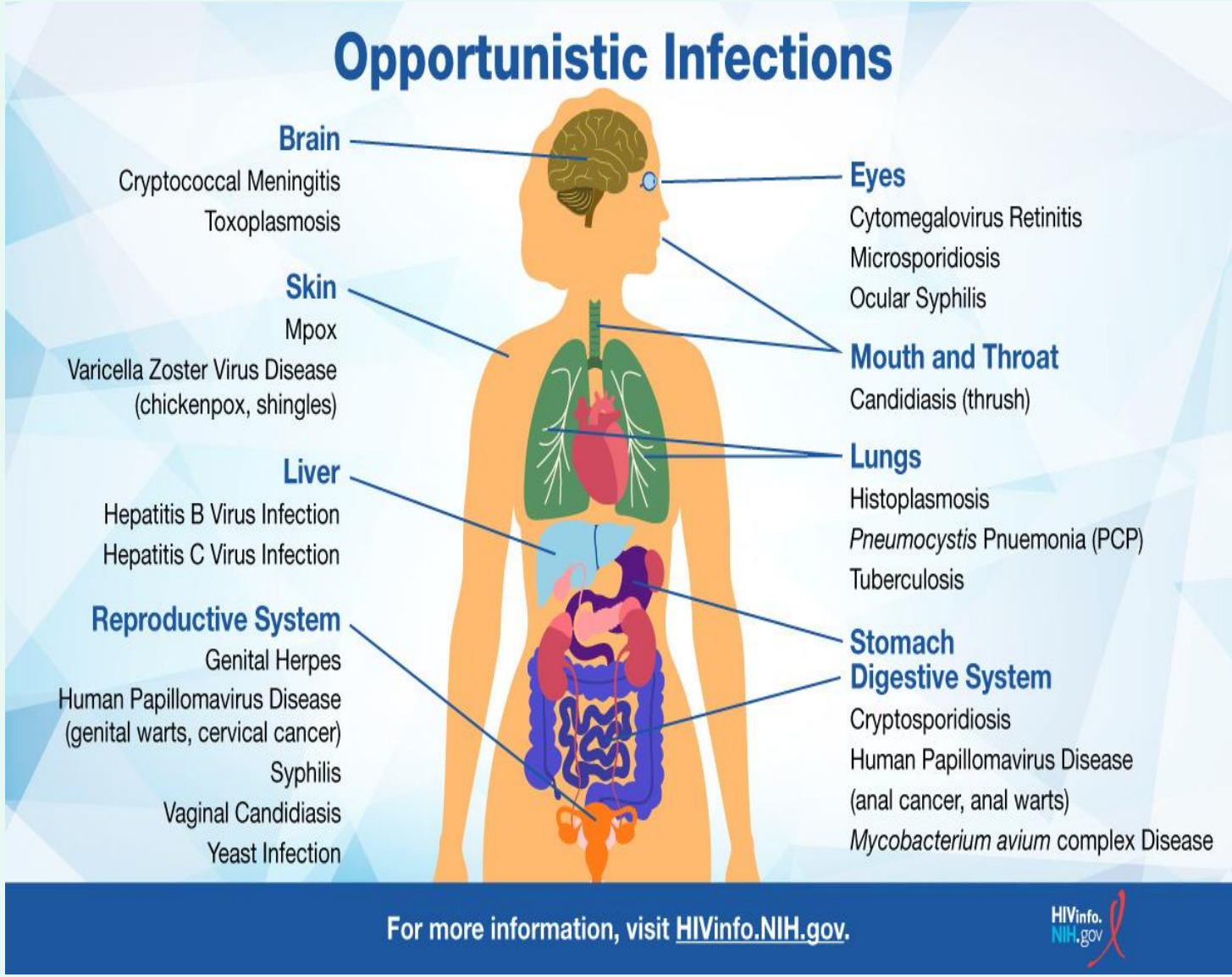
Common Infections Post-Transplant

Transplant recipients are at higher risk for:

- **Influenza**
- **Pneumonia**
- **COVID-19**
- **Respiratory syncytial virus (RSV)**
- **Human papilloma virus (HPV)**

Vaccines play a crucial role in preventing infections

Vigilance and preventative measures are key



Patient Assessment Prior to Vaccination

Before vaccinating a transplant recipient:

- Review the patient's **vaccination history**
- Assess current **immunosuppression levels/conditions**
- Check for any **contraindications** or allergies
- Discuss potential **risks and benefits** with the patient

Thorough assessment ensures safe and effective vaccination

Timing of Vaccination: Key Considerations

- **Pre-transplant:** Ideal, as the immune system is more responsive and less suppressed. Allows for a more robust immune response
    - Pre-transplant is a key window of opportunity, especially for live vaccines
    - Guidelines recommend at least 4 weeks between live vaccine administration and transplantation

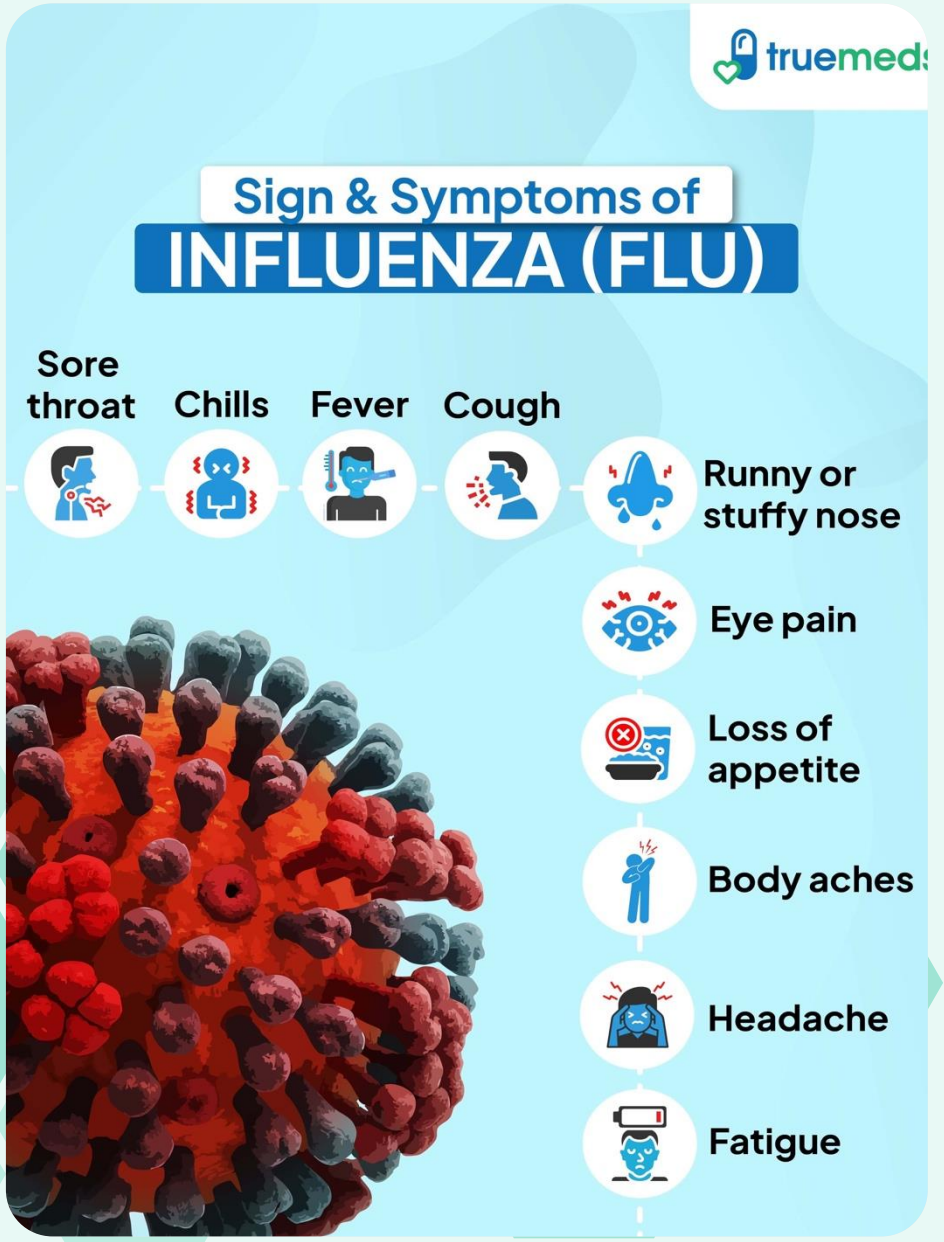
- **Post-transplant:** Timing depends on the level of immunosuppression
    - Generally, wait at least 3-6 months (sometimes 12 months) post-transplant when immunosuppression is stabilized
    - Coordinate with the transplant team to optimize the timing for effectiveness and safety
    - If treated for rejection, then we generally wait 6 months after rejection treatment to proceed with any necessary vaccinations

Vaccinations for solid organ transplant (SOT) candidates and recipients

Vaccine type	Vaccine target	Indications
Nonlive (inactivated, killed, subunit, or recombinant)	Pneumococcal vaccines	All SOT candidates and recipients not previously vaccinated or who need booster doses. Vaccine formulation of choice depends on age, national guidelines, and availability.*
	RSV	SOT recipients ≥50 years old who are ≥1 year post-transplant and have not received treatment against graft rejection in the past 3 months. Some clinicians may also choose to vaccinate SOT recipients between 18 and 49 years of age, particularly lung transplant recipients given their increased risk of severe RSV disease. Limited data suggesting the vaccine is safe and immunogenic in immunocompromised individuals between 18 and 49 years of age. Since these individuals are not included in the ACIP recommendations, vaccination cost may not be covered by insurance for those in the United States.
	Seasonal influenza virus	Annually for all patients ≥6 months old.¶
	HBV	All SOT candidates and recipients who are nonimmune based on serologic testing (eg, HBsAb-negative patients). NOTE: High-dose HBV vaccine or Heplisav-B are preferred to maximize immunogenicity.
	HAV	If not previously vaccinated or immune: ▪ All adult liver transplant candidates and recipients ▪ All pediatric SOT candidates and recipients ▪ At-risk adult nonliver transplant recipients (eg, travel to or residence in an endemic area) NOTE: In the setting of recent outbreaks, reasonable to vaccinate all non-immune SOT candidates and recipients.
	Meningococcus (serotypes A, B, C, W, and Y)	At-risk patients who have not been previously vaccinated, including those treated with eculizumab and those with impaired splenic function. NOTE: Pentavalent MenABCWY vaccine formulation is preferred, when available, to provide the widest coverage against meningococcus.
	Haemophilus influenzae	At-risk patients ≥5 years old who have not been previously vaccinated, including those with impaired splenic function. Children <5 years old should be vaccinated according to the routine schedule.
	HPV	All SOT candidates and recipients not previously vaccinated who meet age-based indications for vaccination.
	DTaP, Tdap, or Td	All SOT candidates and recipients per guidelines for healthy persons (eg, per routine for children).
	RZV	SOT candidates and recipients aged ≥19 years old.
	COVID-19 vaccines$^{\Delta}$	All SOT candidates and recipients. Choice of vaccine depends on age, national guidelines, and availability.
Live, attenuated◇	ZVL	SOT candidates aged >50 years old. NOTE: RZV is preferred, when available, over ZVL. **(ZVL contraindicated post-transplantation).**
	Varicella vaccine	Nonimmune SOT candidates prior to transplantation; can be given as early as 6 months of age in children. **Contraindicated post-transplantation and/or for immunosuppressed patients.**§
	MMR	SOT candidates who have not been previously vaccinated and/or lack evidence of measles, mumps, or rubella immunity (ie, IgG seronegative); can be given as early as 6 months of age in children. **Contraindicated post-transplantation and/or for immunosuppressed patients.**§
	Rotavirus	Per usual guidelines for infants prior to transplantation; not indicated for older children and adults. **Contraindicated post-transplantation and/or for immunosuppressed patients.**

Influenza Infection = The Flu

- Influenza is a common infection after solid organ transplantation
    - Associated with a high morbidity and mortality
- Infection can trigger rejection of the organ
- Although vaccination is safe and effective, protection is incomplete
    - Those who may be exposed to influenza are candidates for antiviral prophylaxis
    - Transplant recipients who develop influenza infection should receive antiviral treatment, regardless of vaccination status



This Year's Influenza Virus

- Subclade K strain of Influenza A, H3N2, is circulating heavily
  - "SUPER K"
  - Spreads rapidly and can progress quickly

- As of 12/30/25 according to the CDC:
  - 15 million illnesses this season
  - 180,000 hospitalizations
  - 7,400 deaths from the flu this season

- During the last week of December there were 1,259 influenza viruses reported by public health labs
  - 1,223 were influenza A (92.3% of these were the Super K strain)

- Emerging data (preprint) shows that this year's influenza vaccine is generating antibodies against Super K – thus providing protection
  - Hence vaccination efforts should be made to vaccinate a large proportion of the population

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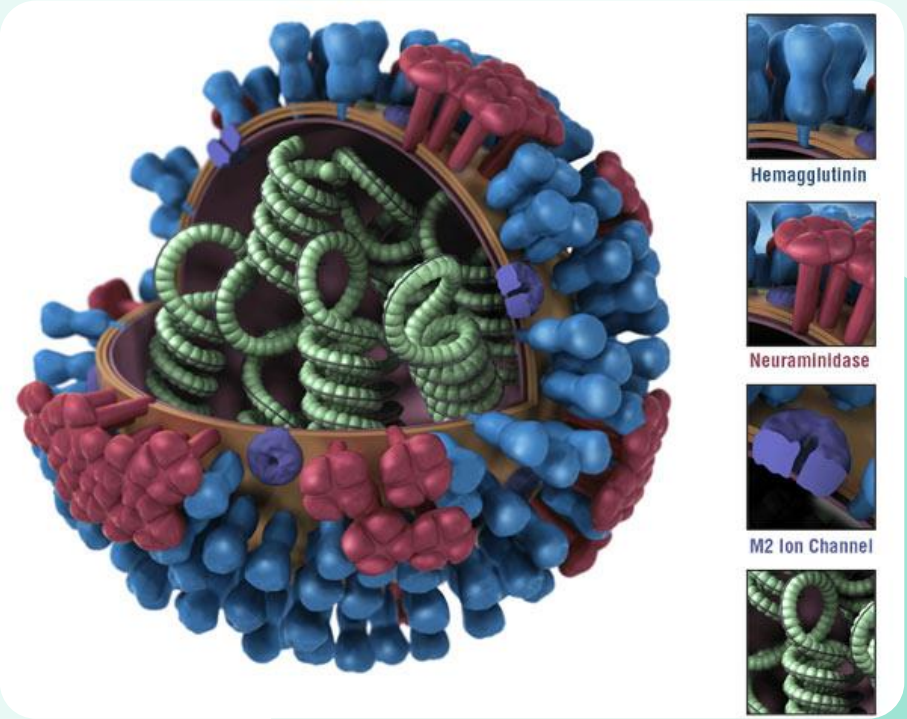
Influenza Vaccine



- Annual administration of **inactivated (NOT THE INTRA-NASAL VACCINE)** seasonal influenza vaccine is indicated for all transplant candidates, recipients, and their household contacts

- For adult (≥18 yrs old) transplant recipients, we prefer the high-dose influenza vaccine

COVID-19 Infection

- Those who are at risk for severe infection (table) should be vaccinated against COVID-19
    - Immunosuppression may lower the threshold for infectious exposure needed to cause infection and impair adequate immune control once infection is established

- Donor-derived infection has been reported with lung transplantation, but not w/ other organ types
- Blood-borne transmission has not been reported and is not expected

- We screen recipients prior to undergoing transplantation
    - For non-lung recipients, if positive for COVID-19 – approach varies from institution to institution depending on recipient's severity of infection

Risk factors for severe COVID-19*

Established and probable risk factors¶

- Age-based risk factors
  - Age ≥65 years△
  - Age ≤4 years (particularly age <2 years)◇
- Asthma
- Cancer
- Cerebrovascular disease
- Chronic kidney disease
- Chronic lung disease (interstitial lung disease, pulmonary embolism, pulmonary hypertension, bronchiectasis, COPD)
- Chronic liver disease (cirrhosis, metabolic dysfunction-associated steatotic liver disease, alcohol-associated liver disease, autoimmune hepatitis)
- Cystic fibrosis
- Diabetes mellitus, type 1 and type 2
- Disabilities (eg, ADHD, cerebral palsy, congenital malformations, learning disabilities, limitations with self-care or activities of daily living, neurodevelopmental disorders, spinal cord injuries)
- Heart conditions (eg, heart failure, coronary artery disease, cardiomyopathies, congenital heart disease)
- Hemophilia
- HIV
- Medical complexity and/or multimorbidity
- Mental health disorders (mood disorders including depression, schizophrenia spectrum disorders)
- Neurologic conditions (dementia, epilepsy, Parkinson disease)
- Obesity (BMI ≥30 kg/m^2) and overweight (BMI 25 to 29 kg/m^2), or ≥95th percentile in children
- Physical inactivity
- Pregnancy or recent pregnancy
- Primary immunodeficiencies
- Smoking (current and former)
- Sickle cell disease
- * Solid organ or blood stem cell transplantation
- Substance use disorders
- Tuberculosis
- Use of glucocorticoids or other immunosuppressive medications

Possible risk factors§

- Alpha 1 antitrypsin deficiency
- Bronchopulmonary dysplasia
- Hepatitis B
- Hepatitis C
- Hypertension
- Thalassemia

COVID-19 Vaccine

- All solid organ transplant recipients should receive COVID-19 vaccination with the most recent updated version of the vaccine, unless contraindicated
- Efficacy of vaccines are lower in solid-organ transplant recipients than the general population
- Benefits of vaccination outweigh risks
- Solid organ transplant recipients should still adhere to protective measures

Moderate to severe immunocompromising conditions that may result in suboptimal COVID-19 vaccine response

Active treatment for solid tumor and hematologic malignancies
Hematologic malignancies associated with poor responses to COVID-19 vaccines regardless of current treatment status (eg, chronic lymphocytic leukemia, non-Hodgkin lymphoma, multiple myeloma, acute leukemia)
Receipt of solid-organ transplant or an islet transplant and taking immunosuppressive therapy
Receipt of chimeric antigen receptor (CAR)-T cell therapy or hematopoietic cell transplant (HCT) (within 2 years of transplantation or taking immunosuppressive therapy)*
Moderate or severe primary immunodeficiency (eg, common variable immunodeficiency disease, severe combined immunodeficiency, DiGeorge syndrome, Wiskott-Aldrich syndrome)
Advanced HIV infection (HIV and CD4 cell counts less than 200/microL, history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV) or untreated HIV infection
Active treatment with: ▪ High-dose corticosteroids (ie, ≥20 mg prednisone or equivalent per day for ≥2 weeks) ▪ Alkylating agents ▪ Antimetabolites ▪ Transplant-related immunosuppressive drugs ▪ Cancer chemotherapeutic agents classified as severely immunosuppressive ▪ TNF blockers ▪ Other biologic agents that are immunosuppressive or immunomodulatory (eg, B cell-depleting agents)

In the United States, the Centers for Disease Control and Prevention lists the above conditions as examples of immunocompromising conditions that warrant additional COVID-19 vaccine doses. This list is not exhaustive; other immunocompromising conditions, such as impaired splenic function, may also warrant the same vaccine adjustments. Refer to other UpToDate content for specifics of vaccine doses and intervals.

Breakthrough COVID-19 despite vaccination

- Breakthrough severe infection has been reported among solid organ transplant recipients
    - One study showed that the risk of breakthrough infection was higher for heart transplant recipients, those of younger age, and for those who are more recently transplanted (<3 months)

- Breakthrough infection rates are overall very low, and therefore vaccination is shown to be providing some degree of protection against the illness

RSV Infection

- RSV = Respiratory Syncytial Virus
- Common respiratory virus that causes common cold-like symptoms
- Can be a severe infection in solid organ transplant recipients

Factors associated with an increased risk of severe RSV disease

- Age 75 and older
- Chronic cardiovascular disease (eg, heart failure, coronary artery disease, or congenital heart disease [excluding isolated hypertension])
- Chronic lung or respiratory disease (eg, chronic obstructive pulmonary disease, emphysema, asthma, interstitial lung disease, or cystic fibrosis)
- End-stage renal disease or dependence on hemodialysis or other renal replacement therapy
- Diabetes mellitus complicated by chronic kidney disease, neuropathy, retinopathy, or other end-organ damage, or requiring treatment with insulin or sodium-glucose cotransporter-2 (SGLT2) inhibitor
- Neurologic or neuromuscular conditions causing impaired airway clearance or respiratory muscle weakness (eg, poststroke dysphagia, amyotrophic lateral sclerosis, or muscular dystrophy [excluding history of stroke without impaired airway clearance])
- Chronic liver disease (eg, cirrhosis)
- Chronic hematologic conditions (eg, sickle cell disease or thalassemia)
- Severe obesity (body mass index ≥40 kg/m^2)
- Residence in a congregate living situation (eg, nursing home)
- Persons with moderate to severe immunocompromise

RSV: respiratory syncytial virus.

Adapted from: Britton A, Roper LE, Kotton CN, et al. Use of respiratory syncytial virus vaccines in adults aged ≥60 years: Updated recommendations of the Advisory Committee on Immunization Practices - United States, 2024. MMWR Morb Mortal Wkly Rep 2024; 73:696.

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Conditions resulting in moderate to severe immunocompromise

- Hematologic malignancies regardless of current treatment status (eg, chronic lymphocytic leukemia, non-Hodgkin lymphoma, multiple myeloma, acute leukemia)
- Receipt of solid-organ transplant or an islet transplant and taking immunosuppressive therapy
- Receipt of chimeric antigen receptor (CAR)-T-cell therapy
- Hematopoietic cell transplant (HCT) recipients (within 2 years of transplantation or taking immunosuppressive therapy)
- Moderate or severe primary immunodeficiency (eg, common variable immunodeficiency disease, severe combined immunodeficiency, DiGeorge syndrome, Wiskott-Aldrich syndrome)
- Untreated or advanced HIV infection (people with HIV and CD4 cell counts less than 200 cells/microL, history of an AIDS-defining illness without immune reconstitution, or clinical manifestations of symptomatic HIV) or untreated HIV infection
- Active treatment with high-dose corticosteroids (ie, 20 mg or more of prednisone or equivalent per day when administered for 2 or more weeks), alkylating agents, antimetabolites, transplant-related immunosuppressive drugs, cancer chemotherapeutic agents classified as severely immunosuppressive, tumor necrosis factor (TNF) blockers, and other biologic agents that are immunosuppressive or immunomodulatory (eg, B-cell-depleting agents)

AIDS: acquired immunodeficiency syndrome; HIV: human immunodeficiency virus.

References:

1. *Melgar M, Britton A, Roper LE, et al. Use of respiratory syncytial virus vaccines in older adults: Recommendations of the Advisory Committee on Immunization Practices - United States, 2023. MMWR Morb Mortal Wkly Rep 2023; 72:793.*
2. *Britton A, Roper LE, Kotton CN, et al. Use of respiratory syncytial virus vaccines in adults aged ≥60 years: Updated recommendations of the Advisory Committee on Immunization Practices — United States, 2024. MMWR Morb Mortal Wkly Rep 2024; 73:696.*

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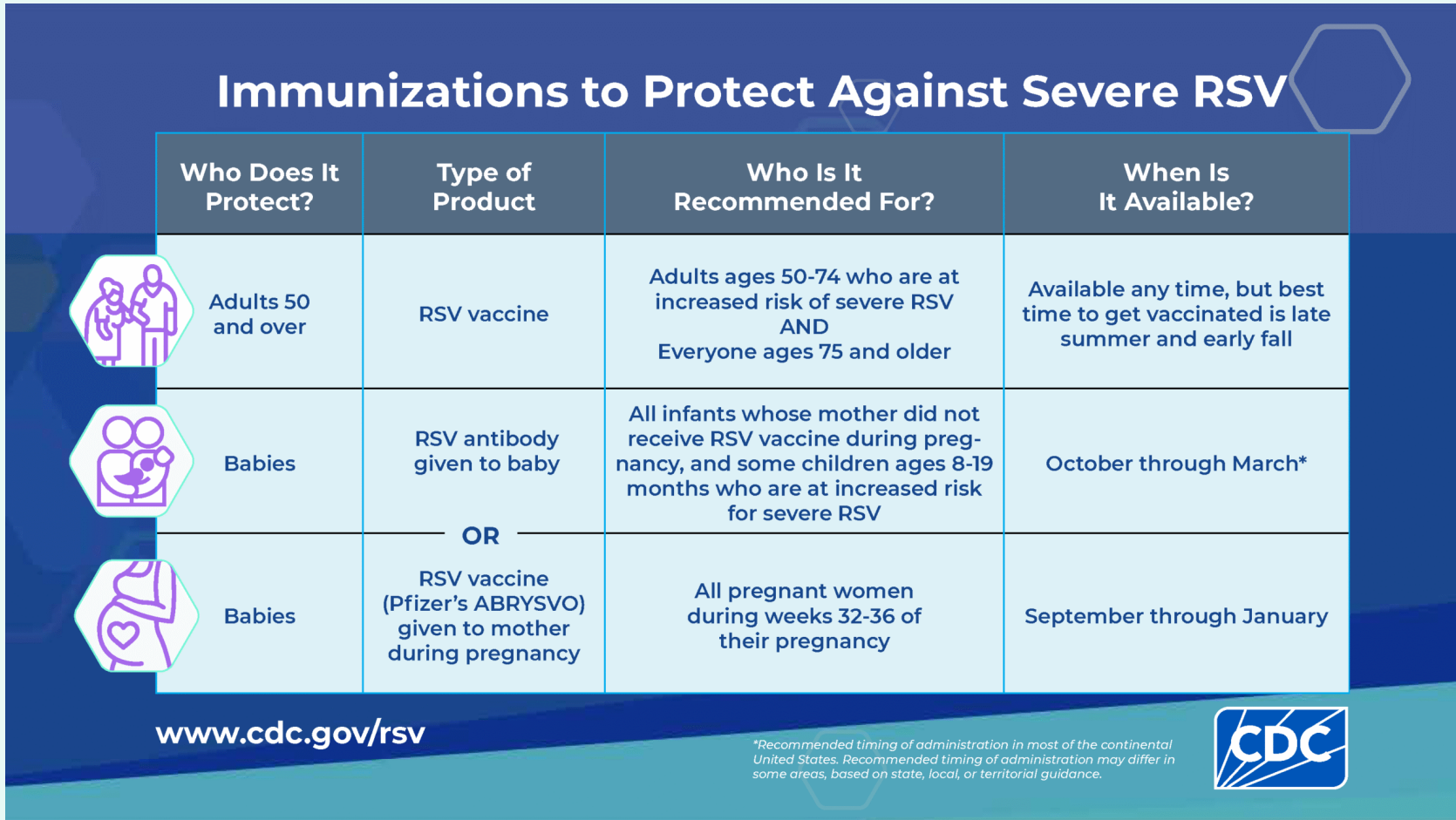
Respiratory Syncytial Virus (RSV) Vaccine

- One-time RSV vaccine required for all transplant recipients ≥ 50yrs of age
- We also often vaccinate those <50 years old, particularly if going for lung transplantation
    - May not be covered by insurance, however

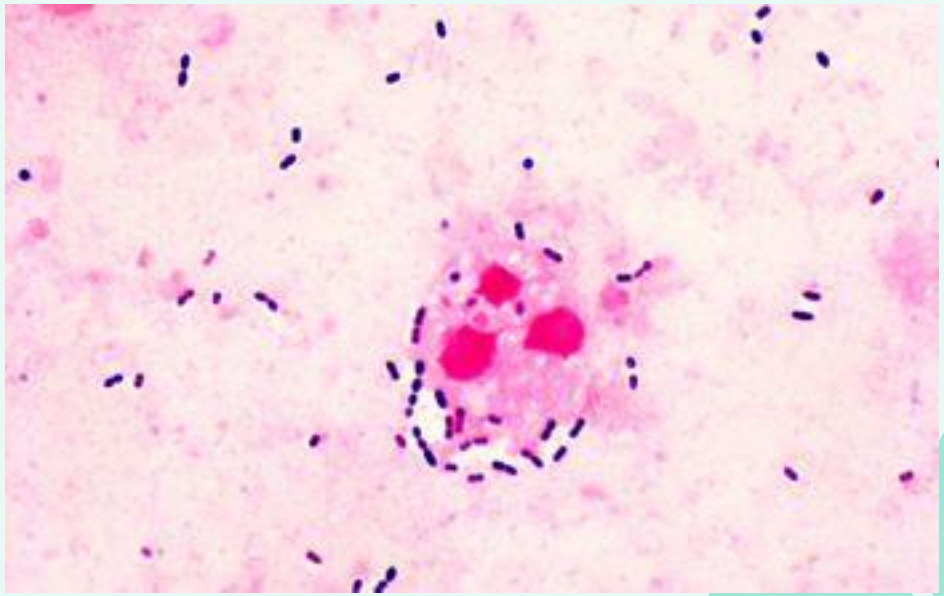


Pneumonia due to pneumococcus

https://radiopaedia.org/cases/13553/play?lang=us

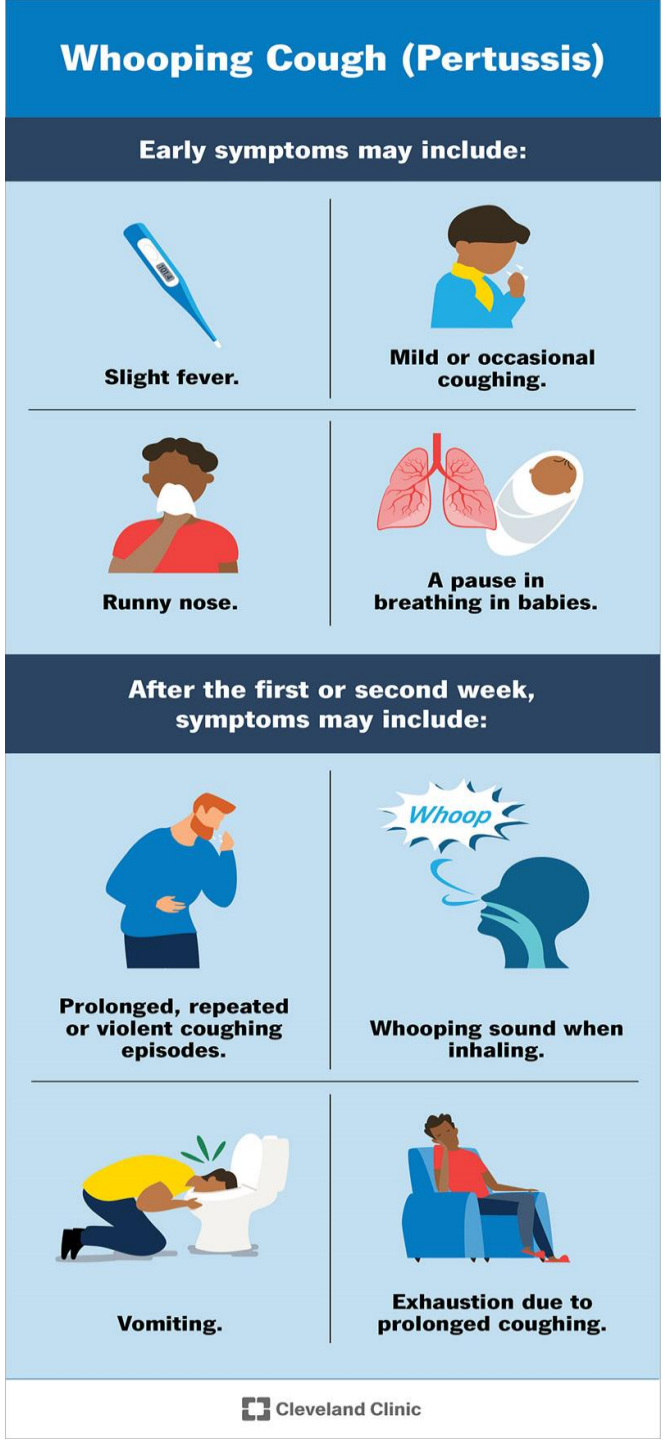
Pneumococcus Pneumonia

- All solid organ transplant candidates and recipients should receive a pneumonia (*streptococcus pneumoniae* AKA pneumococcus) vaccine
- Several studies show that immune response to these vaccines are good but can be diminished compared to non-transplant patients.



Pertussis (Whooping Cough)

- Transmitted by a bacteria: Bordetella pertussis
- Easily transmitted among children and adults
- Reported pertussis cases
    - 2023: 7,063
    - 2024: 35,435 → reaching pre-COVID-19 pandemic levels
        - Implies that COVID-19 measures were preventing transmission
- Illness can cause severe disease and can be fatal
- Tdap (Tetanus, diphtheria, pertussis) vaccine should be given at least once every 10 years
    - Provides protection against pertussis
    - Rising cases of Tetanus too, so helps protect against this, as well
- https://youtube.com/shorts/31tnXPlhA7w?si=UNvtMLir8SF-cFpb
    - What whooping cough sounds like in an adult – the "whoop" is the sound they make when inhaling between coughing



Hepatitis A & B Vaccines

- Hepatitis A vaccine recommended for all adult liver transplant candidates and recipients
    - Hepatitis A can result in fulminant liver failure
    - Should be vaccinated as early as possible
    - Chronic liver disease can blunt the immune response to vaccination

- Hepatitis B vaccine is indicated for all solid organ transplant recipients
    - High-dose vaccination improves immune response
    - Check antibody levels 1 month after full vaccine series given
    - If antibody levels are not at 10 or greater, then revaccination is needed
    - IDEAL timing of vaccination for Hepatitis B is PRE-transplantation

Factors	Hepatitis A	Hepatitis B
Transmission Methods	Spreads through the fecal-oral route, commonly through contaminated food and water.	Spreads through contact with infectious body fluids.
Testing	Blood test to detect HAV antibodies.	Blood test to detect HBV antibodies and determine the phase of infection (acute or chronic).
Severity and Chronicity	Typically acute and resolves without long-term effects.	Can be acute or chronic, with the chronic form leading to severe liver diseases.
Long-Term Effects and Complications	Rarely leads to long-term complications.	Can result in cirrhosis, liver failure, and liver cancer.

Common Wart on Finger

Human Papilloma Virus (HPV) Infection

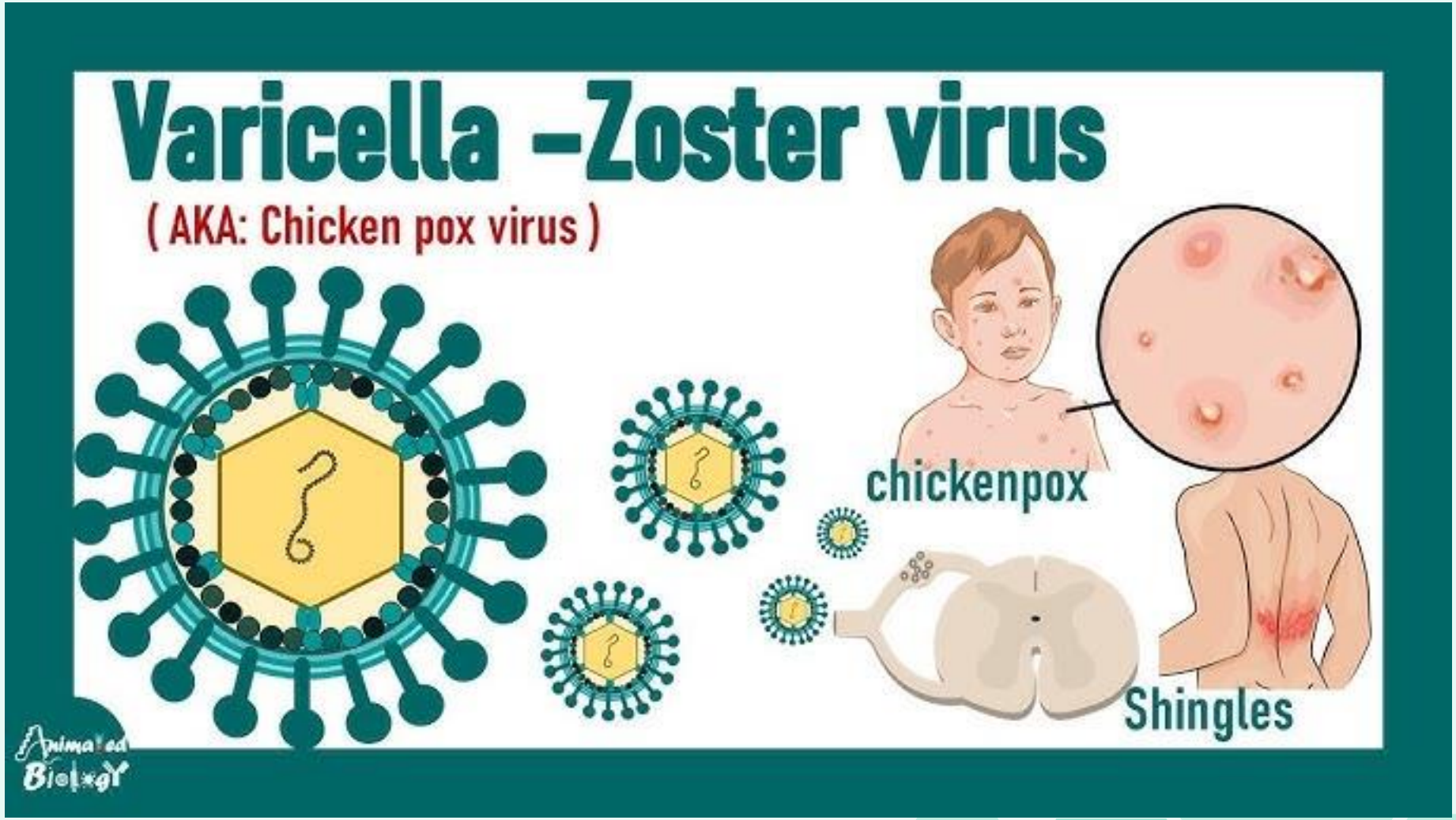
- The cause of common warts on hands, feet, as well as genitals
- The cause of many head/neck, skin, cervical, anal, and penile cancers
- Biologically female solid organ transplant recipients with human papilloma virus (HPV) infection are at a 20- to 100-fold increased risk of cervical cancer
- Both biologically male and female recipients are at risk of anogenital cancers
- One of the leading causes of cancer development in solid organ transplant recipients

Human Papilloma Virus (HPV) Vaccine

- Vaccination should be given prior to transplantation whenever possible
    - Can be given after transplant because it is NOT a live vaccine

- In the U.S. vaccine is approved through age 45 yrs

Varicella Zoster Virus (VZV) Infection



VZV Vaccination

- 2 formulations NONLIVE (Shingrix) and LIVE ATTENUATED (Zostavax – No longer available in the U.S.)
    - AVOID LIVE VACCINES IN TRANSPLANT RECIPIENTS

- All solid organ transplant recipients should be vaccinated against VZV with the Shingrix vaccine
    - 2 doses, spaced 2-6 months apart

Meningococcus Meningitis

- *Neisseria meningitidis*
  - Bacteria that causes meningococcus meningitis
  - Present world-wide, most predominant in the “meningitis belt” of Sub-Saharan Africa
  - Spread through respiratory droplets and close contact
  - Often seen as outbreaks in college dorms in the U.S.

- Certain populations at greater risk for acquisition
  - Those without a functional spleen
  - Those receiving medicines that impact the Complement system of the immune system
    - Complement helps to control meningococcus meningitis

Meningococcal vaccination recommendations for persons age ≥2 years who are at increased risk of meningococcal disease in the United States[1-3]

Risk factor	MenACWY		MenB for those ≥10 years of age	
	Primary dose(s)	Booster dose(s) if increased risk persists	Primary dose(s)	Booster dose(s) if increased risk persists
Immunodeficiency that increases the risk of meningococcal disease				
Complement component deficiency (eg, C3, C5-C9, properdin, factor H, factor D) or use of complement pathway inhibitors (eg, eculizumab, ravulizumab)[*¶] or Anatomic or functional asplenia including sickle cell disease	2 doses of any MenACWY, ≥8 weeks apart[¥]	▪ Age <7 years: 3 years after completion of primary series and every 5 years thereafter ▪ Age ≥7 years: every 5 years	3 doses of either MenB formulation at 0, 1 to 2, and 6 months.[¥‡] MenB formulations are not interchangeable. A single manufacturer's MenB products must be used for each dose of the primary series and all booster doses.	1 year after completion of primary series and every 2 to 3 years thereafter.
Persons with HIV	2 doses of any MenACWY, ≥8 weeks apart	▪ Age <7 years: 3 years after completion of primary series and every 5 years thereafter ▪ Age ≥7 years: every 5 years	MenB is not recommended unless it is otherwise indicated (eg, age 16 through 23 years based on shared decision-making).[†]	
Increased risk of exposure to meningococcal disease				
Microbiologists routinely exposed to meningococcus	1 dose of any MenACWY[¶¥]	▪ Every 5 years	3 doses of either MenB formulation at 0, 1 to 2, and 6 months.[¥‡] MenB formulations are not interchangeable. A single manufacturer's MenB products must be used for each dose of the primary series and all booster doses.	1 year after completion of primary series and every 2 to 3 years thereafter.
Persons who travel to or are residents of countries where meningococcal disease is hyperendemic or epidemic[Δ]	1 dose of any MenACWY[¶]	▪ Age <7 years: 3 years after completion of primary series and every 5 years thereafter ▪ Age ≥7 years: every 5 years	MenB is not recommended unless it is otherwise indicated (eg, age 16 through 23 years based on shared decision-making)[†].	
Unvaccinated or undervaccinated college freshmen living in residence halls[◇]	1 dose of any MenACWY[¶]	▪ No recommendation unless otherwise indicated		
Unvaccinated or undervaccinated military recruits	1 dose of any MenACWY[¶]	▪ Every 5 years depending on assignment[§]		

Meningococcus Meningitis

Meningitis Vaccine

- Covers multiple strains (serogroups) of *Neisseria meningitidis*
    - One vaccine: A, C, W, and Y
    - The other vaccine: B

- Need to be vaccinated **at least 2 weeks before** anti-complement medications are given or development of a non-functional spleen/removal of spleen

- Despite vaccination, those without splenic function will receive antibiotics to also prevent infection with *Neisseria meningitidis*

Haemophilus Influenzae B (Hib) Infection & Vaccination

Infection

- Can cause infection ranging from minor to deadly
- Increasing rates of infection in recent years
- Can cause a variety of infections:
    - Pneumonia
    - Blood stream infection
    - Meningitis
    - Epiglottitis
    - Arthritis/Osteomyelitis
    - Cellulitis
    - Ear infection
    - Pericarditis/Endocarditis

Vaccination

- Adults who have a non-functional spleen or is without a spleen is at risk for infection, so should be vaccinated
- Those receiving anti-complement therapies will also need to be vaccinated

Long-term Monitoring Post-Vaccination

- **Monitor antibody responses** post-vaccination to assess effectiveness
- **Consider booster doses** if antibody levels decline over time
- **Regular follow-up** ensures ongoing protection against vaccine-preventable diseases

Future Directions in Vaccination for Transplant Patients

- Development of **novel vaccine formulations** that elicit stronger immune responses in immunocompromised individuals
- **Personalized vaccination strategies** based on individual immune profiles
- **Research into new vaccines** targeting infections common in transplant recipients

Addressing Common Myths about Vaccines and Transplant Recipients

1

Vaccines cause organ rejection

Numerous studies have debunked this
None of the vaccines talked about thus far have ever caused rejection

2

Recommended vaccines cause infection/illness

For inactivated vaccines, they stimulate an immune response which feels like getting sick, but you are in fact NOT sick with the infection

3

Vaccines do not help with preventing illness

Vaccines prevent many infections and cancers (Hepatitis B and HPV)
Vaccination is a key preventative measure for solid organ transplant recipients

Challenges in Vaccine Uptake Among Recipients

Barriers to vaccination include:

- **Psychological**: Fear of side effects or organ rejection
- **Social**: Misinformation and lack of awareness
- **Logistical**: Difficulty accessing vaccination services, cost

Addressing these barriers is crucial to improving vaccine uptake.

Vaccine Hesitancy

- Vaccines are the among the most effective public health interventions
- Significantly reduces morbidity and mortality from infectious diseases
- Despite their proven efficacy, vaccine hesitancy has emerged as a global challenge

- Misinformation, safety concerns and political decisions have contributed to decreasing vaccination rates, posing threats to public health

- Decades of evidence show that vaccines are safe, effective and most the most reliable means of protection from serious vaccine-preventable diseases

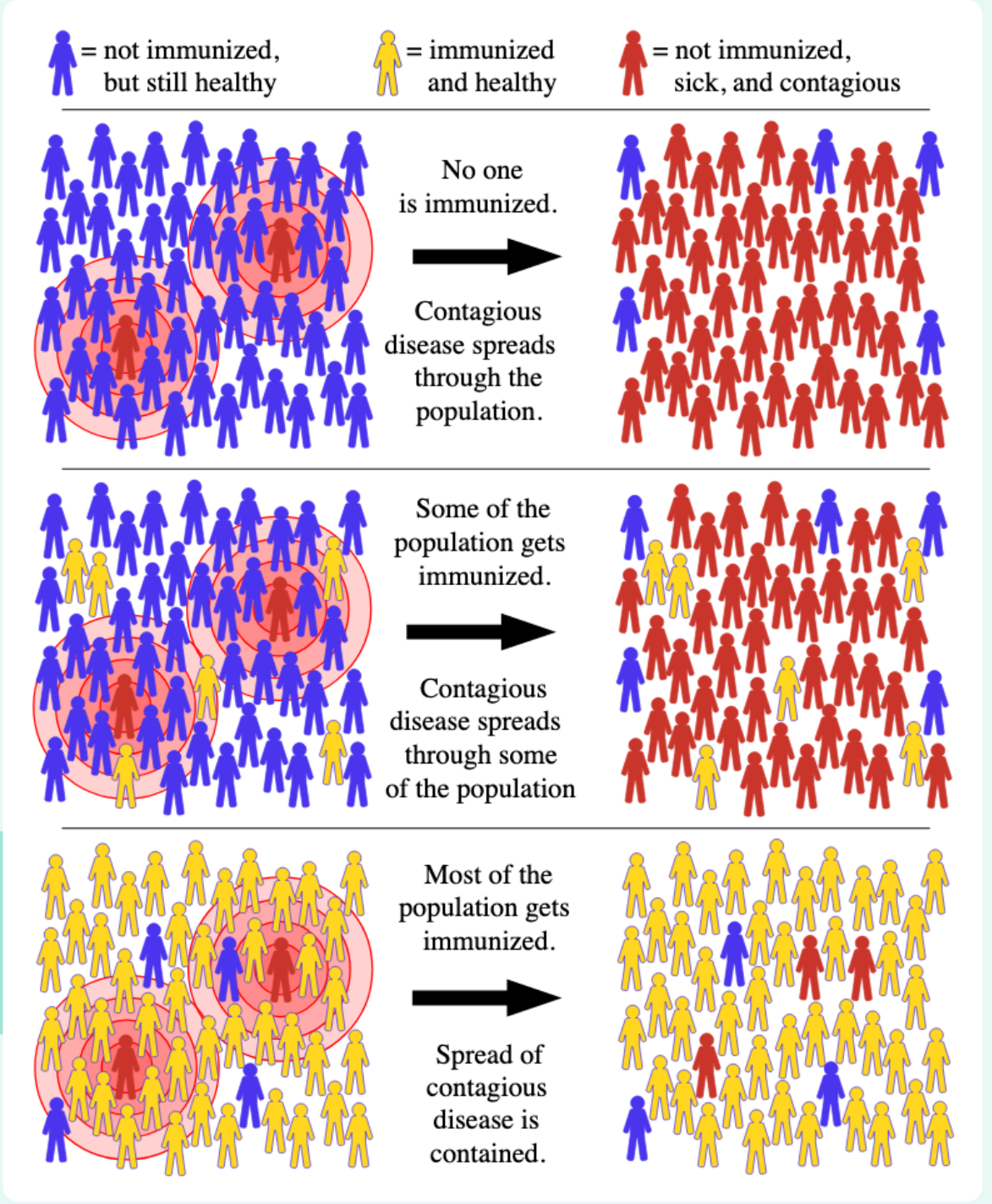
- The World Health Organization (WHO) recognizes vaccine hesitancy as one of the top threats to global health
    - Undermines herd immunity and equitable access to preventative care

- Vaccine hesitancy varies across populations, vaccine types, and geographic regions
    - Influenced by sociocultural, political and historical factors

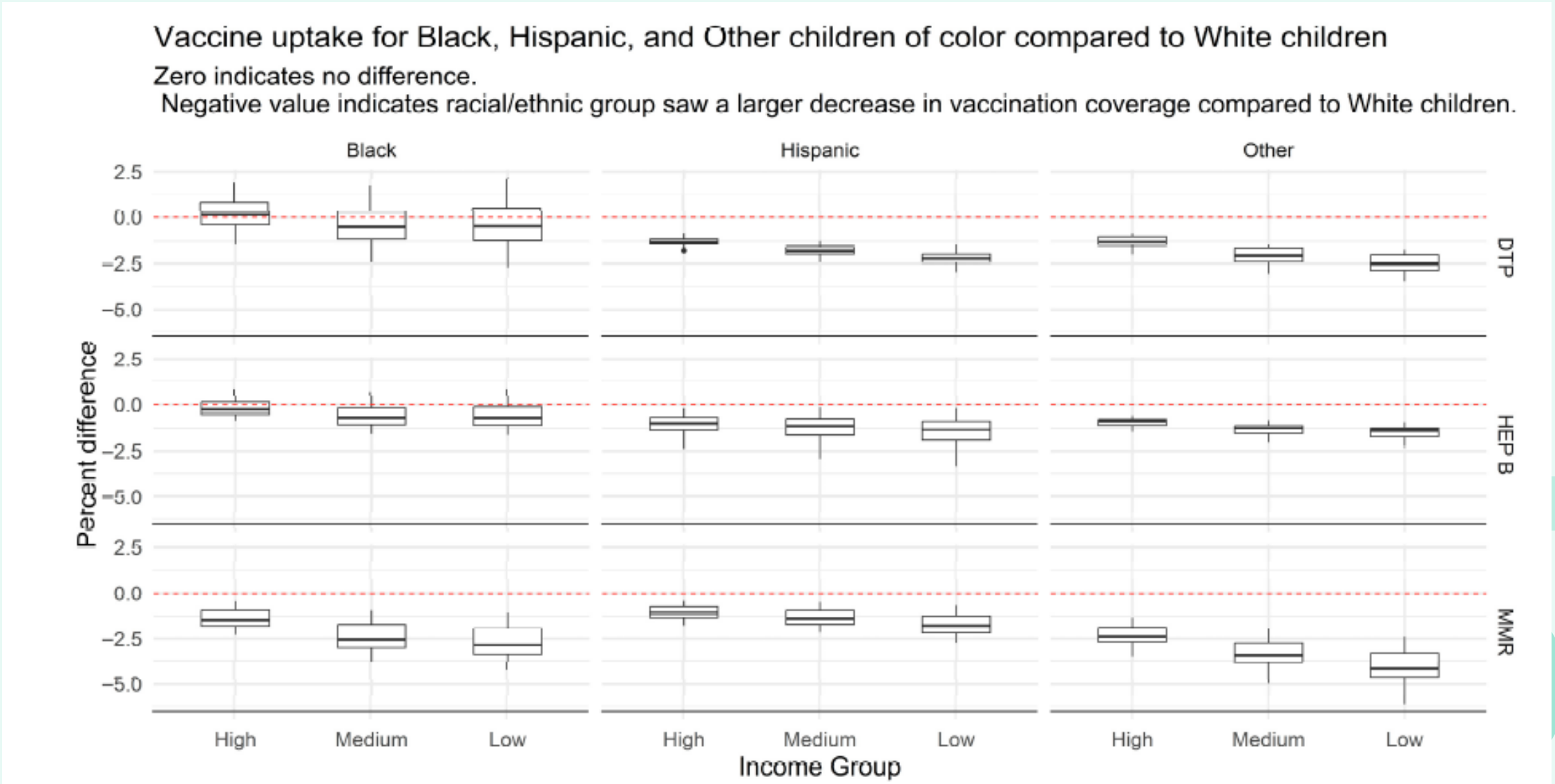
- Health care workers are a critical component to providing education and answering questions about vaccines to mitigate misinformation

What is Herd Immunity?

- AKA Herd Effect; Community Immunity; Population Immunity; or Mass Immunity
- An indirect protective effect when a sufficient percentage of the population has become immune to an infection, either through prior infection or vaccination
- Once herd immunity has been reached, disease gradually disappears and may result in eradication (or permanent reduction of infections to zero if achieved worldwide)



Barriers to vaccination	Social determinants of health	Challenges rooted in social and economic conditions, including financial constraints, lack of insurance, limited transportation options, inflexible work schedules, competing demands, and language or literacy barriers that reduce access to vaccination.
	Structural barriers	Physical and systemic obstacles to vaccination access, such as limited availability of healthcare providers in rural or underserved urban areas, clinic hours that do not accommodate working individuals, brief or rushed clinical interactions.
	Data limitations	Gaps in the collection, quality, and use of data hinder the ability to identify disparities, track progress, tailor interventions, and assess the effectiveness of vaccination programs.
	Policy constraints	Restrictive or fragmented policies, underfunded and understaffed public health departments, and a complex healthcare infrastructure that together limit coordination, outreach, and the implementation of effective vaccination strategies.
	Messaging and education	Lack of clear, consistent, and culturally relevant public health communication; limited access to quality health education; and insufficient understanding of vaccine science, safety, and development processes contribute to confusion and reduced confidence in vaccines.


Vaccine uptake for Black, Hispanic, and Other children of color compared to White children
Zero indicates no difference.
Negative value indicates racial/ethnic group saw a larger decrease in vaccination coverage compared to White children.
Black
Hispanic
Other
DTP
HEP B
MMR
Percent difference
2.5
0.0
−2.5
−5.0
High
Medium
Low
Income Group

Drivers of vaccine hesitancy	Misinformation	False or misleading information—often spread through social media and informal networks—that promotes inaccurate claims about vaccine safety, ingredients, or effectiveness, contributing to fear and confusion.
	Concerns with safety or side effects	Fears about immediate or long-term side effects of vaccines, including beliefs that vaccines may cause chronic conditions such as autism or infertility, despite scientific evidence to the contrary.
	Perception of low vaccine efficacy or importance	Belief that vaccines are ineffective in preventing illness, or that the targeted disease is not serious or pervasive enough to warrant vaccination.
	Distrust in institutions	Deep-rooted skepticism toward healthcare systems and government agencies due to historical and ongoing experiences of racism, neglect, and marginalization.
	Impact of COVID-19 pandemic	The COVID-19 pandemic has heightened public doubt through perceived inconsistencies in public health guidance, concerns about rapid vaccine development, increased exposure to misinformation, and lasting distrust in health authorities.
	Religious, cultural, or political reasons	Vaccine hesitancy influenced by religion, cultural beliefs, or political ideology, including preferences for traditional medicine, beliefs in divine protection, or resistance tied to political identity.
	Agency and autonomy	Resistance rooted in feeling coerced, manipulated, or lacking control in the decision-making process, including concerns about mandates and the right to make personal health choices.

Interventions to improve vaccination uptake	Population-specific, tailored strategies	Design interventions that are responsive to the unique needs, concerns, and contexts of different populations, avoiding one-size-fits-all approaches and allowing for flexibility and adaptation over time.
	Community engagement	Engage communities directly in the design, planning, and implementation of vaccination initiatives. Collaborate with trusted local organizations to build relationships and increase vaccine acceptance and access.
	Improve accessibility	Expand vaccine access through mobile clinics, evening and weekend hours, school-based vaccinations, and community events. Provide support services such as transportation and childcare. Eliminate out-of-pocket costs for recommended vaccines.
	Culturally and linguistically competent	Ensure vaccine information is culturally relevant, written in plain language, and available in the languages spoken by the target populations. Clinical interactions should also reflect cultural humility and respect.
	Trusted messengers and workforce representation	Share vaccine information through trusted community voices. Build a diverse healthcare workforce on all levels that reflects the racial, cultural, and linguistic backgrounds of the communities it serves.
	Provider recommendation	Strengthen vaccine uptake through clear and confident provider recommendations, personalized interactions, motivational interviewing, and sufficient time to answer patient questions and concerns.
	Education and communication	Develop community-centered education and outreach efforts that address misinformation, improve health literacy, and connect people to vaccine services. Use storytelling, social media, and short videos to increase reach and engagement.
	Policy priorities	Implement policy measures such as school-entry vaccine requirements and other mandates that improve equity and support higher vaccination rates.
	Data quality and enhancement	Strengthen vaccination data systems by improving local-level data collection, disaggregating by social and demographic factors, and using data to guide targeted outreach and intervention strategies.

Take away statements regarding vaccine hesitancy…

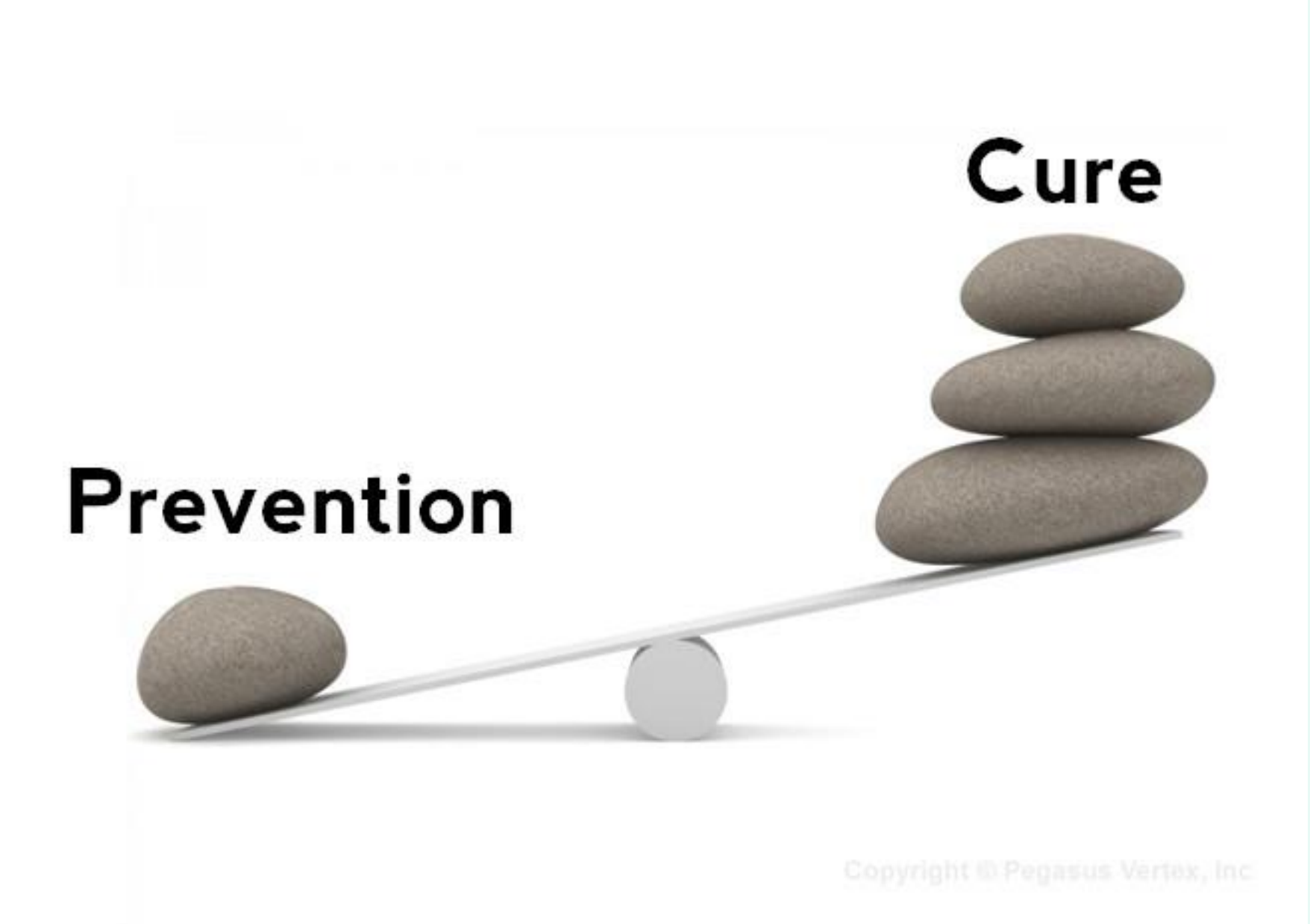
- Overcoming vaccine hesitancy requires more than correcting misinformation or implementing one-size-fits-all policies
- We need a comprehensive, equity-focused approach
- It is necessary to rebuild public trust and address systemic barriers
- Community voices in the development and delivery of various inventions are crucial

Conclusion: The Vital Role of Vaccinations in Transplant Health

Vaccinations are **essential** for improving outcomes in solid organ transplant recipients

- Reduce the risk of serious infections and even some cancers
- Enhance long-term health
- Improve quality of life

Vaccination is a cornerstone of post-transplant care.



“An ounce of prevention is worth a pound of cure”
– Benjamin Franklin