VACCINATION BEST PRACTICES

THE BASICS & BEYOND

This resource is not meant to be comprehensive.

For more information, consult the professional standards for medication administration; full product Prescribing Information; and guidelines from the Centers for Disease Control and Prevention (CDC), the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and your state health department or agency.

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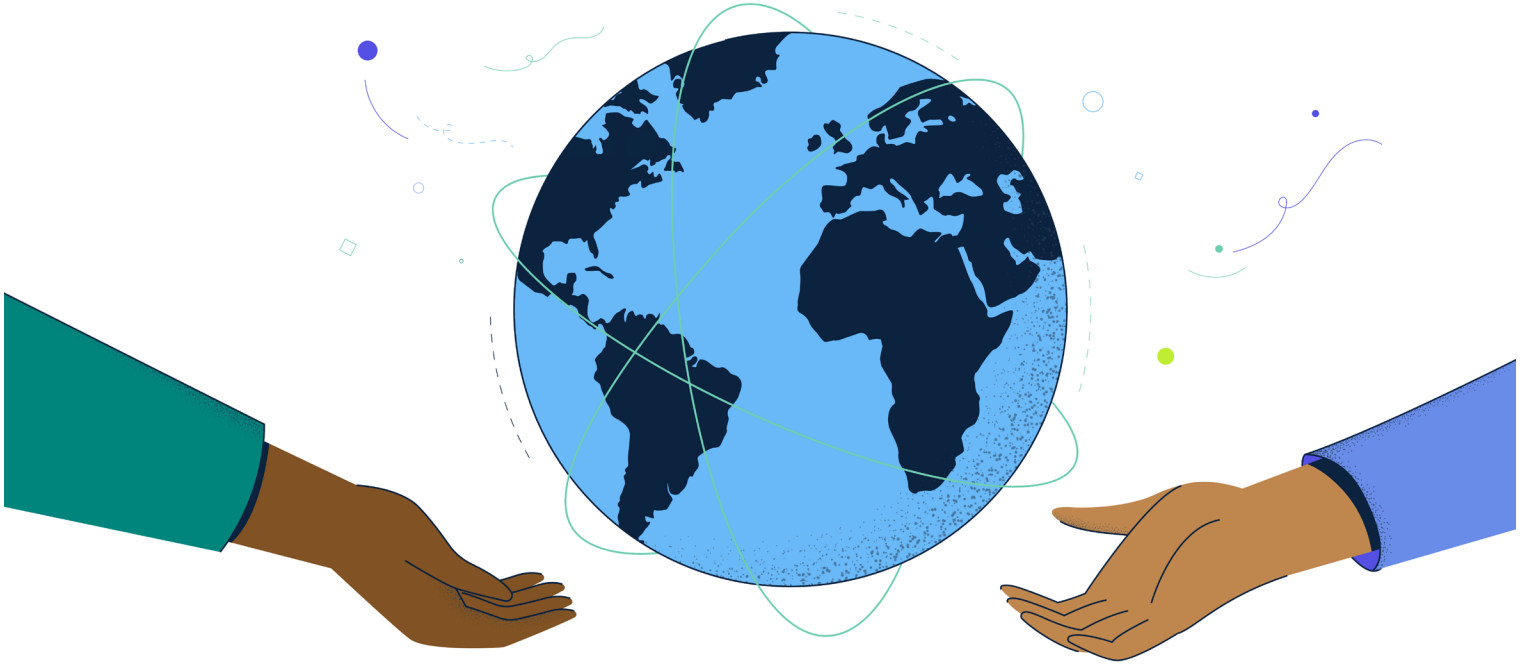
The importance of vaccines

Vaccines have greatly reduced diseases that once routinely harmed babies, children, and adults. People all over the world—including in the US—still become seriously ill or die from diseases that vaccines can help prevent.[1]



Timely vaccination throughout childhood helps provide immunity before children are exposed to potentially life-threatening diseases. Monitoring a child's status to ensure that all vaccinations are being given and the child is up-to-date is essential.[2,3]

Immunity from childhood vaccines can wear off over time, however, and adults are at risk for different diseases based on age, health conditions, job, lifestyle, and travel habits. It is therefore important for adults to keep their vaccinations up-to-date, too.[4]

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Shared health goals

In order to help protect communities from preventable diseases, it is important to establish shared health goals. **Healthy People 2030** is a national effort that sets goals and objectives to improve the health and well-being of people in the United States by establishing data-driven, national objectives over the course of the decade.[5]

The overarching goals include[5]:

Attaining

healthy, thriving lives, and well-being free of preventable disease, disability, injury, and premature death

Eliminating

health disparities, achieving health equity, and attaining health literacy to improve the health and well-being of all

Creating

social, physical, and economic environments that promote attaining the full potential for health and well-being for all

Promoting

healthy development, healthy behaviors, and well-being across all life stages

Engaging

leadership, key constituents, and the public across multiple sectors to take action and design policies that improve the health and well-being of all

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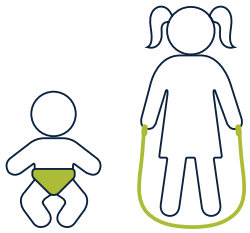
Shared health goals *(continued)*

Increasing vaccination rates can help achieve these national health goals. Every year in the US, many people get diseases that vaccines can prevent. One focus of Healthy People 2030 is to prevent certain infectious diseases by increasing vaccination rates.[6]



Infants and children[6]

need to get vaccinated to prevent certain diseases. Although most children get recommended vaccines, some US communities have low vaccination coverage that puts them at risk for outbreaks. **Strategies to make sure more children get vaccinated — like requiring vaccination for children who are in school — are key to reducing rates of infectious diseases.**

Adolescents, adults, and older adults[6]

also need vaccines. For example, almost everyone age 6 months and older needs a yearly flu vaccine. **Teaching people about the importance of vaccines, sending vaccination reminders, and making it easier to get vaccines can help increase vaccination rates in adolescents and adults.**

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Shared health goals *(continued)*

Healthy People 2030 selected vaccination core objectives

	Baseline	Target
Children by age 2[7,a] Reduce the proportion of children who receive 0 doses of recommended vaccines by age 2 years	1.3%	1.3%
All individuals[8,b] Increase the proportion of persons aged ≥6 months who are vaccinated annually against seasonal influenza	51.6%	70.0%

To review additional vaccination core objectives, please visit
https://health.gov/healthypeople/objectives-and-data/browse-objectives

[a]Baseline refers to children born in 2015.[7]

[b]Baseline refers to the flu season of 2019 to 2020.[8]

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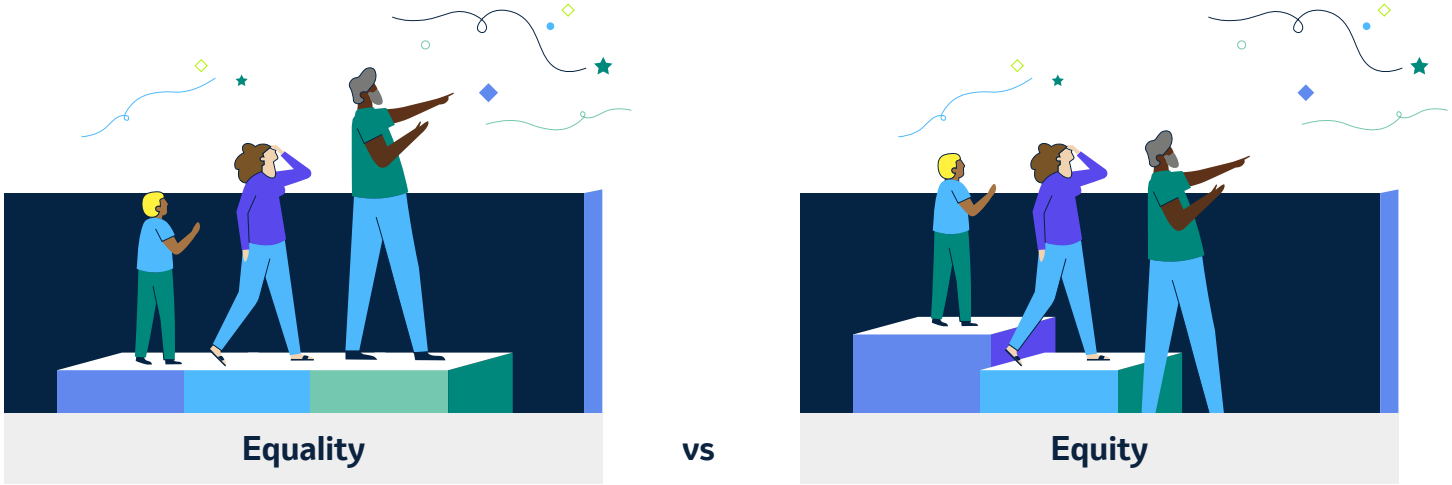
Health and vaccine equity

All appropriate persons should have the opportunity to get vaccinated. In 2020, CDC launched the *Partnering for Vaccine Equity* (P4VE) program to help increase equity in adult immunization, with a focus on equity in vaccine access and uptake for groups that experience disparities in immunization. **P4VE addresses disparities in vaccination among those belonging to racial and ethnic minority groups by partnering with national, state, local, and community organizations who are working on the ground to increase vaccine confidence and access in their communities.**[9,10]

Health equity is the state in which everyone has a fair and just opportunity to attain their highest level of health, and vaccine equity is achieved when everyone has fair and just access to vaccination.[10,11]

Ensuring health equity requires valuing everyone equally with focused efforts to address avoidable inequalities, injustices, and health care disparities.[10]



Equality is achieved when each person or group of people is given the same resources or opportunities for their health.[12]
Equity involves recognizing that each person or group of people has different circumstances, and health resources should be allocated accordingly to reach an equal outcome.[12]

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How we get there

In order to achieve greater health and vaccine equity, and to work toward the shared health goals established by Healthy People 2030, we must begin by addressing vaccination best practices within individual health care facilities. These practices will help your facility to participate in improving health and well-being nationwide.

In this deck, we will review:

Barriers

Common barriers to vaccine access and uptake

Methods

Strategies and techniques for increasing vaccination coverage

Management

Storage, handling, and administration of vaccines

Development

Continuous learning practices for both staff and patients

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Accessibility

There are various reasons that people may not be up-to-date on certain vaccines, and barriers to vaccination may be physical or psychological.

Physical barriers might include inconvenient clinic hours for working patients or parents, long waits at a clinic, or transportation issues, while psychological barriers may pertain more to an individual's unpleasant past experiences.[13]

Other recognized barriers to adult vaccination include[13]:

- Multiple competing priorities for providers
- Low awareness among adults about recommended vaccines and their benefits
- Challenges in coordinating care for adults who have more than one health care provider (HCP)
- A complicated adult vaccination schedule
- Vaccine cost and reimbursement

Determine needs of the patient population[13,14]

Recognize psychological barriers to health care[13]

Address barriers to health care[13]

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Missed opportunities[13]

Missed opportunities occur at health care encounters when a person is eligible to receive a vaccine but is not vaccinated completely. Missed opportunities can occur in any vaccine setting, whether routine or not.

At the provider level:

- Many HCPs avoid simultaneous administration of multiple injectable vaccines, citing concerns about reduced immune response, adverse events, or perceived parental objections, which are not supported by scientific data
- HCPs might be unaware that the child or adult needs a vaccination
- HCPs sometimes follow invalid contraindications. (A list of conditions incorrectly perceived as contraindications or precautions can be found in ACIP's General Best Practice Guidelines for Immunization)

At the system level:

- Larger system issues, such as policies of only vaccinating children at well-care visits or not vaccinating siblings, likewise contribute to missed opportunities
- Institutional or bureaucratic regulations, such as state insurance laws denying reimbursement if a vaccine is administered during an acute-care visit, create missed opportunities, too

Several studies have shown eliminating missed opportunities could increase vaccination coverage by up to 20%. Providers should implement systems to ensure the practice never misses an opportunity to vaccinate. Establish a policy to vaccinate at every visit, not just well-care visits, and schedule the next vaccination appointment before the patient leaves.

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Missed opportunities *(continued)*[13]

Foster support for vaccination in your practice

The best ways to facilitate increased vaccination are to[13]:

Save time

Spend less time in vaccine conversations by involving all staff in reinforcing vaccine recommendations and implementing effective workflow processes

Save money

Spend less money on lost vaccines by adhering to proper vaccine storage, handling, and administration practices

Empower families

Strengthen trust with families by helping patients and parents make informed decisions

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Standards for adult practice

National Vaccine Advisory Committee (NVAC) Practice Standards for all HCPs[15]

- Assess vaccination status of all your patients at every clinical encounter
- Strongly recommend appropriate vaccines that patients need
- Administer or refer your appropriate patients to a vaccination provider
- Document vaccinations received by your patients

Vaccine needs assessment[15]

Vaccine recommendation[15]

Vaccine administration referral[15,16]

Vaccine documentation[15,17]

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Vaccines for Children Program[18]

The Vaccines for Children (VFC) Program helps provide vaccines to children whose parents or guardians may not be able to afford them, so that all children have a better chance of getting their recommended vaccinations on schedule.

Vaccines available through the VFC Program are those recommended by the ACIP. These vaccines protect babies, young children, and adolescents from 16 diseases.

Children are eligible for VFC vaccines if they are younger than 19 years of age and are one of the following:

- Medicaid-eligible
- Uninsured or underinsured
- American Indian or Alaska Native

What does “underinsured” mean?

Underinsured means the patient has health insurance, but it won’t cover the vaccine(s) because the insurance:

- Doesn’t cover any vaccines
- Doesn’t cover certain vaccines
- Covers vaccines, but it has a fixed dollar limit or cap for vaccines. Once that fixed dollar amount has been reached, the patient becomes eligible for VFC vaccines

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Vaccines for Children Program *(continued)*

Benefits of the VFC program for your practice[19]

- Keep patients in their medical home
- Reduce up-front costs to patients
- Help provide quality care to vulnerable children and adolescents

Becoming a VFC provider[19]

Any HCP authorized by their state to prescribe vaccines can be a VFC provider, including non-Medicaid providers. To become a VFC provider:

- Contact state/local/territory VFC coordinator to request enrollment
- Complete and return the State Provider Enrollment forms
- Prepare for a site visit to go over the program's administrative requirements and proper storage and handling of vaccines

The CDC estimates that vaccination of children born between 1994 and 2021 will[20]:

Prevent 472 million illnesses

(29.8 million hospitalizations) **more than the current population of the entire US**

Help avoid 1,052,000 deaths

greater than the population of Seattle, Washington

Save nearly $2.2 trillion

in total societal costs (that includes $479 billion in direct costs) **more than $5,000 for each American**

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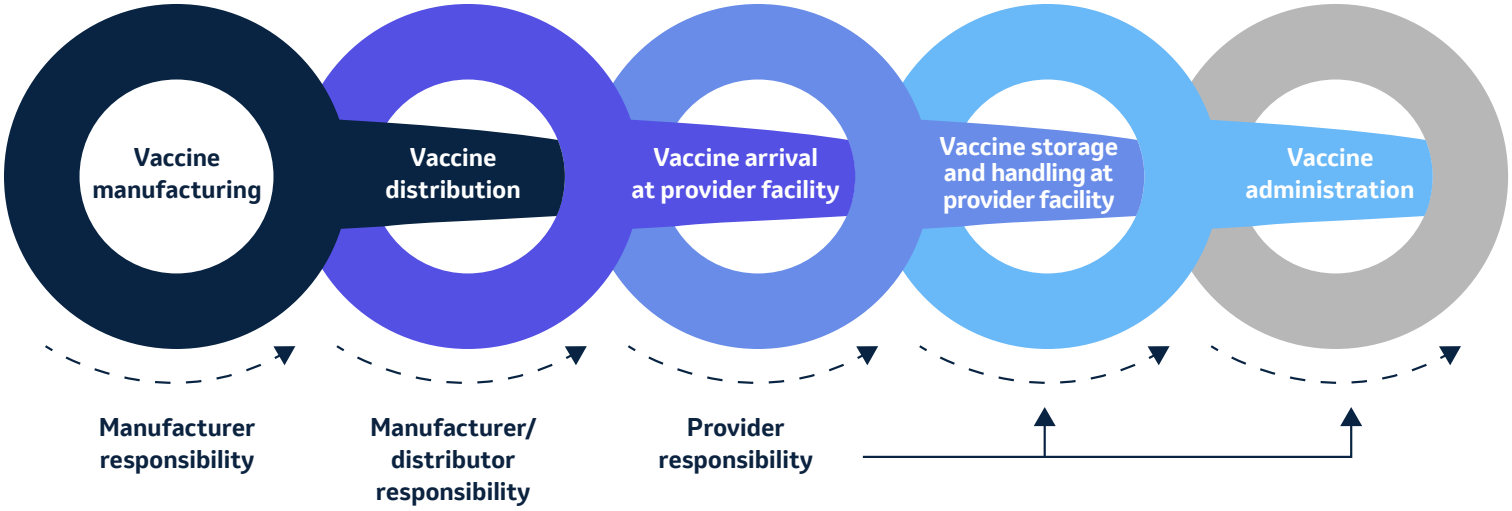
Vaccine storage equipment

Vaccines must be kept at the proper temperature at all times — this is called "maintaining the cold chain."[21]

Cold chain flowchart[22]

The cold chain begins with cold storage at the manufacturing plant and extends to the transport, delivery, and storage of the vaccine until administration to the patient.



This section provides guidance on vaccine storage and equipment per the CDC. Individual projects and state/local health department vaccination programs may have specific requirements for providers who receive VFC vaccines or other vaccines purchased with public funds. Consult your vaccination program for more information.

Check the full Prescribing Information on the vaccine manufacturer's website for specific storage temperature instructions.

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Vaccine storage equipment *(continued)*[21]

In order to maintain the cold chain, refrigerators should maintain temperatures between 2°C and 8°C (36°F and 46°F), and freezers should maintain temperatures between -50°C and -15°C (-58°F and +5°F). Refrigerator or freezer thermostats should be set at the factory-set or midpoint temperature, which will decrease the likelihood of temperature excursions.

- Purpose-built or pharmaceutical-grade units designed to either refrigerate or freeze biologics, including vaccines, are preferred. These units can be compact, under-the-counter style, or large units.
- If a purpose-built or pharmaceutical-grade unit is not available, a stand-alone, household-grade unit may be an acceptable option in some practice settings.[a]
- All units should have enough space to store the largest inventory expected at the busiest point in the year (eg, flu season) without crowding.

Never store any vaccine in a dormitory-style or bar-style combined unit. These units pose a significant risk of freezing vaccines due to their design, even when used for temporary storage.

Visit www.cdc.gov for more on storage units and thermometers.

[a]Only the refrigerator compartment of a household-grade combination refrigerator/freezer unit should be used. The freezer compartment of this type of unit is not recommended for storing vaccines and there may be areas of the refrigerated compartment that should not be used as well.

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Monitoring vaccine temperatures[21]

Storage unit minimum and maximum temperatures should be checked and recorded at the start of each workday.

A temperature monitoring log sheet should be placed on each storage unit door (or nearby), and the following information should be recorded:

- Minimum/maximum temperature (or current temperature if using a device that does not record minimum/ maximum temperatures)
- Date
- Time
- Name of person who checked and recorded the temperature
- Any actions taken if a temperature excursion occurred

If a reading is missed, leave a blank entry in the log. Such entries should be distinguished from entries in which the temperature monitoring device (TMD) failed to display a reading.

Daily: Check unit doors throughout the day and always at the end of the day to ensure they are tightly closed.

Weekly: Review storage unit temperature readings for changes in temperature trends that might require action. Temperature data should be kept for 3 years (unless state statutes or rules require a longer period).

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Monitoring vaccine temperatures *(continued)*[21]

Temperature monitoring devices (TMDs)

Every vaccine storage unit must have a reliable TMD. The CDC recommends the use of a continuous monitoring and recording device called a digital data logger (DDL), set at recording intervals of at least every 30 minutes. DDLs provide details on how long a unit has been operating outside the recommended temperature range. Each DDL should have a current and valid Certificate of Calibration Testing to ensure device accuracy.

Temperature data from a DDL can be downloaded to a computer using software or retrieved from a website for user review, which is critical to ensuring vaccine safety. The software or website may also allow the user to set the frequency of temperature readings.

DDL characteristics[22]

Calibration testing[22]

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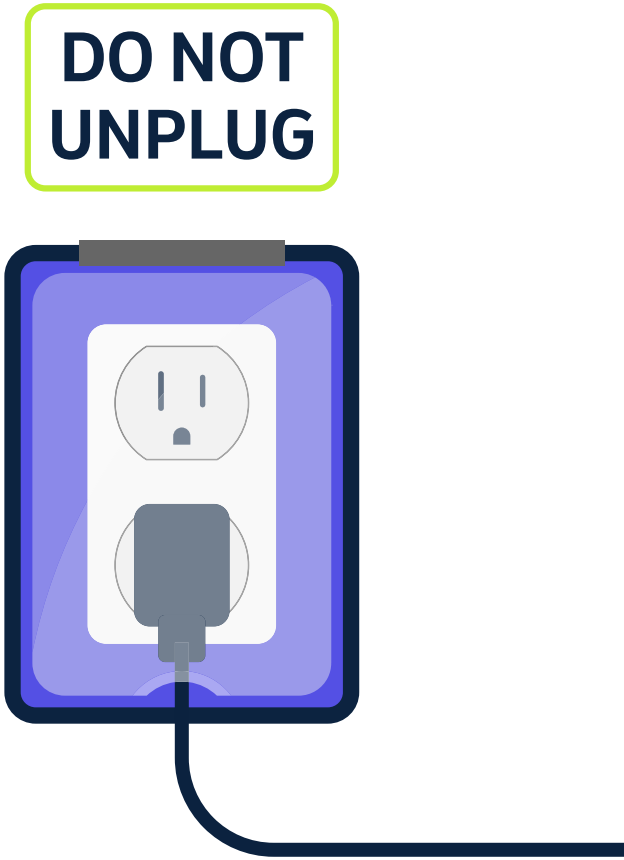
Power supply[21]

To protect the storage unit's power supply:

- Plug in only one storage unit per electrical outlet
- Use a safety-lock plug or an outlet cover to prevent the unit from being unplugged
- Post "DO NOT UNPLUG" warning signs at outlets and on storage units to alert staff, custodians, electricians, and other workers not to unplug units
- Label fuses and circuit breakers to alert people not to turn off power to storage units
- Use caution when using power outlets that can be tripped or switched off and avoid using built-in circuit switches (that may have reset buttons), outlets activated by a wall switch, and multi-outlet power strips



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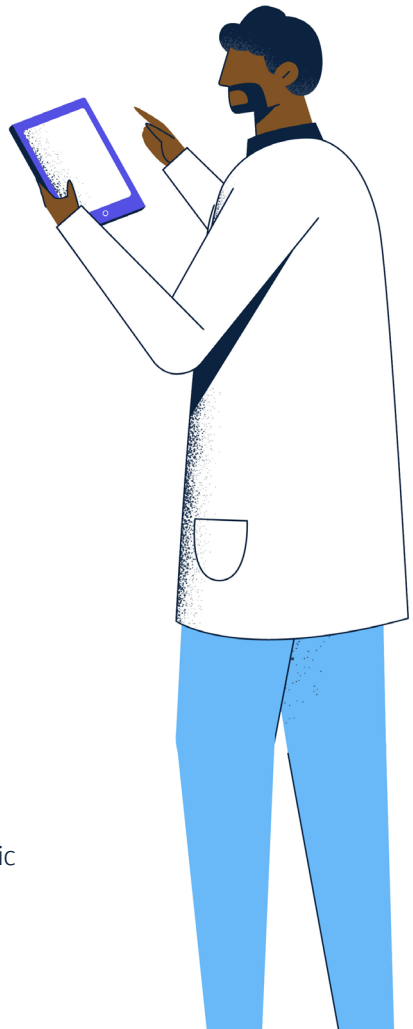
Vaccine storage and handling standard operating procedures (SOPs)[21]

Facilities should develop and maintain clearly written, detailed, and up-to-date storage and handling SOPs. SOPs should be reviewed by all staff and updated by the vaccine coordinator annually.

SOPs should contain plans and information for 3 major areas:

- **General information:** include contact information for vaccine manufacturers, equipment service providers, and important facility staff, as well as job descriptions, regularly used forms, and staff training requirements
- **Routine storage and handling:** include information for all aspects of vaccine inventory management, from ordering to monitoring storage conditions
- **Emergency vaccine storage, handling, and transport:** outline steps to be taken in the event of equipment malfunctions, power failures, natural disasters, or other emergencies that might compromise vaccine storage conditions

VFC providers or those who have vaccines purchased with public funds should contact their vaccination program for guidance regarding routine and emergency SOPs.



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Storing vaccines[21]

To confirm vaccines are stored correctly and to minimize the risk of administration errors:

- Store vaccines in their original packaging with lids closed in separate containers until ready for administration to protect them from light and provide additional thermal stability/protection
- Place vaccines and diluents with the earliest expiration dates in front of those with later expiration dates
- Store vaccines and diluents with similar packaging or names, or with pediatric and adult formulations, on different shelves
- Whenever possible, store diluent with the corresponding refrigerated vaccine; never store diluent in a freezer
- Position vaccines and diluents two to three inches from the unit walls, ceiling, floor, and door
- Arrange vaccines and diluents in rows and allow space between them to promote air circulation
- Avoid placing or storing any items other than vaccines, diluents, and water bottles inside storage units. If other medications and biological products must be stored in the same unit as vaccines, they must be clearly marked and stored in separate containers or bins from vaccines. Potentially contaminated items (eg, blood, urine, stool) should be properly contained and stored below vaccines to avoid contamination from drips or leaks
- Place the TMD in the center of the unit with the vaccines surrounding it; a DDL should be set to measure temperature no less frequently than every 30 minutes

This section provides guidance on vaccine storage and equipment per the CDC. Individual projects and state/local health department vaccination programs may have specific requirements for providers who receive Vaccines for Children (VFC) vaccines or other vaccines purchased with public funds. Consult your vaccination program for more information.

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Inventory management[21]

Conduct a vaccine inventory assessment at least once a month and before placing vaccine orders to ensure adequate vaccines and diluents are on hand. Determining factors for ordering include projected demand, storage capacity, and current vaccine supplies. Many state and local immunization information systems (IISs) have vaccine inventory accounting functions, and VFC providers may be required to use the IIS to track inventory.

Stock records[22]

Vaccine ordering[22]

Stock rotation and removal[21,22]

Vaccine disposal[21,22]

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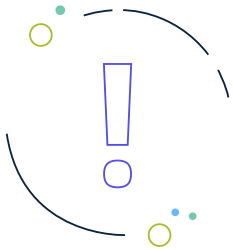
Shipments[22]

Vaccines and diluents must be carefully unpacked, stored at recommended temperatures, and documented immediately after they arrive. Do not place an unopened and/or unpacked shipment box in a vaccine storage unit because the cool packs shipped with the vaccine may make the packaged vaccine too cold if placed inside the storage unit.

Immediately examine shipments for signs of damage and to guarantee receipt of the appropriate vaccine types and quantities.

- Examine the shipping container and vaccines for signs of physical damage
- Check the contents against the packing list to be sure they match. For frozen vaccines, the packing list will show the maximum time vaccines can be in transit based on shipment date
- If the shipment includes lyophilized (freeze-dried) vaccines, make sure they came with the correct type and quantity of diluents
- Immediately check both vaccine and diluent expiration dates to ensure you have not received any expired or soon-to-expire products
- Immediately check the CCM (if one was included) for any indication of a temperature excursion during transit



Never leave a vaccine shipping container unpacked and unattended. If vaccines and diluents get too warm, they cannot be used. Be sure all staff knows that vaccine deliveries require immediate attention.

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Emergency vaccine storage and handling[22]

Emergencies usually happen without warning and may compromise vaccine storage conditions. Every facility should have clearly defined emergency plans in place.

Alternative storage facility

Establish a working agreement with at least one alternative storage facility even if you have a generator as backup equipment. Make sure you have 24-hour access to this facility. Hospitals, long-term care facilities, state depots, the Red Cross, fire stations, packing plants, and commercial pharmacies are some of the facilities that may be able to assist you.

Accessing your building after hours

Your facility's storage and handling SOPs should include instructions for accessing your vaccine storage units when the building is closed, with a building map/diagram and locations of spare batteries, flashlights, keys, locks, circuit breakers, and emergency transport equipment and materials.

Monitoring unit temperature during a power outage

If your storage unit has an external temperature monitoring display that you can check without opening the unit door, take the following steps:

- Record room temperature (if possible) and the temperature inside the unit as soon as the power goes out
- Record minimum and maximum temperatures reached inside the unit during the outage
- If temperatures have fallen outside of the recommended range, follow your procedures for temperature excursions

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Review vaccination schedules

- Vaccination providers should adhere to recommended vaccination schedules. Administration at recommended ages and in accordance with recommended intervals between doses of multidose antigens provides optimal protection[23]
- Administer all appropriate vaccines during the same visit. Children and adults often need more than one vaccine at the same time. Giving more than one vaccine at the same clinical visit is preferred because it helps keep patients up-to-date[23]
- The most current schedules can be viewed and downloaded at **www.cdc.gov/vaccines/index.html**, the CDC's National Immunization Program website[24,25]

Review manufacturers' guidelines for individual vaccines[26]

- Professional standards for medication administration, manufacturer instructions, and organizational policies and procedures should always be followed when applicable

Screen patients[26]

- Before administering any vaccine, patients should be screened for contraindications and precautions, even if the patient has previously received that vaccine. The patient's health condition or recommendations regarding contraindications and precautions for vaccination may change from one visit to the next
- Many state vaccination programs and other organizations have developed standardized screening tools. Consult your state's vaccination program for more information or visit **www.cdc.gov**
- Screening checklists for Adult and Child Vaccination are available within the Clinic Tools menu at **www.immunize.org**

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Before you start[26]

- Hand hygiene is critical to prevent the spread of illness and disease. Hands should be cleansed with a waterless, alcohol-based hand rub or soap and water

Prepare vaccines

- Prepare vaccines in a clean, designated medication area away from where the patient is being vaccinated and away from any potentially contaminated items. This is to prevent inadvertent contamination of the vial through direct or indirect contact with potentially contaminated surfaces or equipment[27]
- Health care personnel should ensure their clinic has the supplies needed to administer vaccines[27]
- Use a separate needle and syringe for each injection[27]
- Always check the expiration dates on the vaccine and diluent, if needed. Some syringes and needles have expiration dates, so check those, too. NEVER use expired vaccine, diluent, or equipment[27]
- Prepare vaccines only when you are ready to administer them[27]
- Before withdrawing each dose, the vial should be agitated to mix the vaccine thoroughly and obtain a uniform suspension. The vaccine should be visually inspected for discoloration and precipitation or to see if it cannot be resuspended before administration. If problems are noted, the vaccine should not be administered[26]

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Vaccines are available in different presentations, including single-dose vials (SDV), manufacturer-filled syringes (MFS), multidose vials (MDV), oral applicators, and a nasal sprayer. Always check the label on the vial or box to determine:

- It is the correct vaccine and diluent (if needed)
- The expiration date has not passed. Expired vaccine or diluent should never be used

Single-dose vials (SDV)

Most vaccines are available in SDVs. SDVs do not contain preservatives to help prevent microorganism growth. Therefore, vaccines packaged as SDVs are intended to be punctured once for use in one patient and for one injection. Even if the SDV appears to contain more vaccine than is needed for one patient, it should not be used for more than one patient. Once the appropriate dosage has been withdrawn, the vial and any leftover contents should be discarded appropriately. SDVs with any leftover vaccine should never be saved to combine leftover contents for later use.

Manufacturer-filled syringes (MFS)

MFSs are prepared with a single dose of vaccine and sealed under sterile conditions by the manufacturer. Like SDVs, MFSs do not contain a preservative to help prevent the growth of microorganisms. MFSs are intended for one patient for one injection. Once the sterile seal has been broken, the vaccine should be used or discarded by the end of the workday.

Multidose vials (MDV)

A MDV contains more than one dose of vaccine. MDVs are labeled by the manufacturer and typically contain an antimicrobial preservative to help prevent the growth of microorganisms. Because MDVs contain a preservative, they can be punctured more than once. Only the number of doses indicated in the manufacturer's package insert should be withdrawn from the vial. Partial doses from two or more vials should never be combined to obtain a dose of vaccine.

Oral applicators and nasal sprayer

An oral applicator is for use with oral vaccines and contains only one dose of medication. Oral vaccines do not contain a preservative.

A nasal sprayer is used for the live, attenuated influenza vaccine.

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Reconstituting vaccines[28]

1 For most single-dose vaccine products, select a syringe and needle of proper length to be used for both reconstitution and administration of the vaccine.

2 Before reconstituting, check labels on both the lyophilized vaccine vial and the diluent to verify that:
- They are the correct two products to mix together
- The diluent is the correct volume
- Neither the vaccine nor the diluent has expired

3 Reconstitute vaccine just prior to use by:
- Removing the protective caps and wiping each stopper with an alcohol swab
- Inserting needle of syringe into diluent vial and withdrawing entire contents
- Injecting diluent into lyophilized vaccine vial and rotating or inverting to thoroughly dissolve the lyophilized powder

4 Check the appearance of the reconstituted vaccine.
- Reconstituted vaccine may be used if the color and appearance match the description on the package insert
- If there is discoloration, extraneous particulate matter, obvious lack of resuspension, or the vaccine cannot be thoroughly mixed, mark the vial as "DO NOT USE," return it to proper storage conditions, and contact your state or local health department immunization program or the vaccine manufacturer

5 If reconstituted vaccine is not used immediately or comes in a multidose vial, be sure to:
- Clearly mark the vial with the date and time the vaccine was reconstituted
- Maintain the product at 2° to 8°C (36° to 46°F); do not freeze

Once reconstituted, the vaccine should be administered within the time frame specified for use in the manufacturer's package insert; otherwise, the vaccine should be discarded.[26]

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Preventing administration errors[26]

Vaccines, like other medications, can be involved in errors. Vaccine administration errors can have many consequences, including inadequate immunological protection, possible injury to the patient, cost, inconvenience, and reduced confidence in the health care delivery system.

Error reporting helps us understand how errors occur and share ideas to prevent or reduce those errors in the future. Health care personnel should be encouraged to report errors and to trust that the situation and those involved will be treated fairly. When a vaccine administration error occurs, HCPs should determine how it happened and put strategies in place to prevent it in the future. Blame-seeking, on the other hand, fails to address root causes of errors and does not foster an environment that values reporting and investigation.

Common vaccine administration errors[26]

Guidance for handling some common vaccine administration errors is included in ACIP's General Best Practice Guidelines for Immunization.[23]

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Vaccination records

Accurate and timely documentation of administered vaccines helps prevent administration errors and curtail the number and cost of excess vaccine doses. HCPs who administer vaccines covered by the National Vaccine Injury Compensation Program (which include all vaccines listed on the ACIP recommended child and adolescent vaccination schedule) are required by law to ensure the permanent medical record of the recipient indicates:

- Date of administration
- Vaccine manufacturer
- Vaccine lot number
- Name and title of the person who administered the vaccine and the address of the facility where the permanent record will reside
- The edition date of the vaccine information statement (VIS) distributed and the date it was provided to the patient

Records of vaccine refusal

Although there is no national law, it is also important to document when parents or adult patients refuse vaccines despite the vaccine provider's recommendation. Professional organizations such as the AAP and others have developed forms to document when vaccines are refused (**https://downloads.aap.org/DOPCSP/SOID_RTV_form_01-2019_English.pdf**)

IISs

By age 2 years, more than 20% of the children in the US typically have seen more than one HCP, resulting in scattered paper medical records. Vaccine providers are strongly encouraged to participate in an IIS to consolidate vaccination data from multiple providers, and some states mandate documenting vaccinations in an IIS. Laws regarding using an IIS vary by state or region.

Always provide a personal vaccination record to the patient or parent that includes the names of vaccines administered and the dates of administration. Because personal vaccination records or forms can vary between states, please contact your state or local vaccination program for more details.

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HCPs should know the policies and procedures for identifying and reporting adverse events after vaccination.

- **A vaccine adverse event** refers to any medical event that occurs after vaccination which may or may not be related to vaccination. Further assessment is needed to determine if an adverse event is caused by a vaccine
- **An adverse vaccine reaction** is an untoward effect caused by a vaccine

Severe allergic reactions

Severe life-threatening anaphylactic reactions following vaccination are rare. Thorough screening for contraindications and precautions prior to vaccination can often prevent reactions. HCPs should be familiar with identifying immediate-type allergic reactions.

All vaccine providers should be certified in cardiopulmonary resuscitation (CPR) and be skilled in administering epinephrine. Equipment needed for maintaining an airway should be available for immediate use and the provider should be skilled in using the equipment.

Providers should contact emergency medical services immediately if there's an anaphylactic reaction to vaccination, and staff members should know their individual roles in the event of an emergency.

Syncope

All HCPs who administer vaccines to older children, adolescents, and adults should be aware of the potential for syncope after vaccination and the related risk of injury caused by falls. Appropriate measures should be taken to prevent injuries if a patient becomes weak or dizzy or loses consciousness:

- Have the patient seated or lying down for vaccination
- Be aware of symptoms that precede fainting (eg, weakness, dizziness, pallor)
- Provide supportive care and take appropriate measures to prevent injuries if such symptoms occur
- Strongly consider observing patients (seated or lying down) for 15 minutes after vaccination to decrease the risk for injury should they faint

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After vaccinating *(continued)*[29]

Reporting an adverse event

HCPs are required by law to report certain adverse events, and encouraged to report other events, following vaccination to the Vaccine Adverse Event Reporting System (VAERS).

VAERS is a national program managed by the CDC and the US Food and Drug Administration (FDA) to monitor the safety of all vaccines licensed in the US. VAERS collects and reviews reports of adverse events that occur after vaccination. VAERS cannot determine if a vaccine caused an adverse event, but can determine if further investigation is needed.

Additional details on reporting adverse events after vaccination can be found at https://vaers.hhs.gov

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Continuous learning[30]

Working toward increasing vaccination coverage will require continuous learning on the part of providers and patients alike.

This will entail training staff and implementing strategies within your facility. Create roles and responsibilities around vaccination coverage and utilize tools to help keep patients up-to-date. Provide resources for patients and hold conversations to address your patients' concerns.

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Staff training and education[26]

Policies should be in place to validate HCPs' knowledge of, and skills in, vaccine administration.

All HCPs should receive comprehensive, competency-based training before administering vaccines.

- Training, including an observation component, should be integrated into HCPs' education programs including orientation for new staff and annual continuing education requirements for all staff
- HCPs should receive educational updates as needed (for example, when vaccine administration recommendations are updated or when new vaccines are added to the facility's inventory)
- Training should also be offered to temporary staff who may be filling in on days when the facility is short-staffed or helping during peak periods of vaccine administration, such as influenza season
- Once initial training has been completed, accountability checks should be in place to ensure staff follow all vaccine administration policies and procedures

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Vaccine coordinator[13]

Every provider setting should designate a vaccine coordinator.

This individual should be the provider site's point person for activities such as:

- Ensuring all vaccines are stored and handled correctly within the practice
- Confirming all staff are trained in their roles in vaccination delivery and patient education
- Monitoring the practice's vaccination coverage
- Verifying all staff know how to address questions from patients and parents so there is consistent messaging about vaccines
- Promoting and motivating staff implementation of immunization quality improvement strategies to improve vaccination workflow, delivery, and, ultimately, vaccine uptake

By understanding the practice's vaccination coverage and why some patients are not up-to-date with their vaccines, providers can implement interventions to increase coverage in their practice.

Visit the CDC website (www.cdc.gov) for checklists to start a vaccination program in your practice.

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Vaccination champion

Assign a vaccination champion for your practice.[30]

Any clinical provider can serve as a vaccine champion to steward and advocate for vaccinations in your practice. Being the vaccination champion should be written into the provider's job description with time devoted to perform their tasks. Offices should cross-train staff and appoint a different person to complete these duties in case the vaccination champion is unavailable. If the vaccination champion is not a physician, a physician should provide oversight to the vaccination champion.

Unloading, stocking, and monitoring vaccines[31]

Managing vaccine inventory[31]

Ordering vaccines[31]

Implementing office-wide strategies to increase vaccination coverage[31]

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Standing orders[30]

Another proven way to increase vaccination rates is to use standing orders. Standing orders may be in place to instruct all health care personnel to administer vaccinations to patients for whom they're recommended. Standing orders include procedures for screening patients for contraindications and vaccinating eligible patients.

For details, see:

- Immunize.org (**immunize.org/standingorders/**)
- State or city vaccination coalitions

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Electronic health records

Your team should take advantage of the capacity of the electronic health record (EHR) to provide reminders when vaccines are needed. EHRs communicate with the state's or city's IIS to identify which vaccines a patient needs and increase adult vaccination rates. If your practice isn't using its state or city IIS, contact your state or city IIS manager for information about benefits and practice enrollment.[32]

Use EHR systems to:

- Prompt providers to determine patients' vaccination needs and recommend appropriate vaccinations[30]
- Identify patients who are not up-to-date with their vaccinations and send a notice to these patients to schedule an appointment for vaccinations[30]

Vaccination reminder-recall systems[30]

are cost-effective methods to identify and notify patients who are due soon for vaccinations (reminder) or are already behind (recall).

Reminder and recall systems help ensure optimal vaccination rates. Staff members first pull a list containing names and contact information of patients who are due or overdue for vaccinations and then contact those patients to schedule a time to receive vaccinations.[30]

Update vaccination records and family contact information at every visit in order to use reminder-recall systems effectively. Building these practices into patient flow is key.[30]

For details, see:

- The Community Guide (**thecommunityguide.org/vaccines/clientreminder.html**)

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Provide resources to patients

Provide vaccine information statement (VIS)[33]

The National Childhood Vaccine Injury Act (NCVIA) legally requires VISs be provided to the patient, parent, guardian, or legal representative by vaccine providers before each dose of vaccine. Documentation that the VIS was provided is also required. Copies of VISs are available from state and local vaccination programs or can be downloaded.

What are VISs?[26]

VISs are documents that inform vaccine recipients or their parents about the benefits and risks of a vaccine. Everyone, including adults, should be given the appropriate VIS when receiving a vaccine covered under the law.

The VIS must be given:

- **Before** the vaccine is administered
- **Regardless of the age** of the person being vaccinated
- **Every time** a dose of vaccine is administered, even if the patient has received the same vaccine and VIS in the past

Where to obtain VISs:

- CDC: **www.cdc.gov/vaccines/hcp/vis/**
- Immunize.org: **www.immunize.org/vis**
- Your State Health Department. Downloadable versions of VISs can be ordered from your local health department and are suitable for reproducing as handouts for patients.

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HCPs can play an important role in parents' decisions regarding vaccination.[34]

Many parents who change their minds about either delaying or refusing a vaccination for their child list "information or assurances from HCP" as the main reason.

Recommendation from an HCP for a vaccination can be a strong predictor of patient compliance.[13] Conversely, the failure of HCPs to discuss vaccination with patients is a common reason for vaccine noncompliance.[35]

In one survey, **79% to 85% of consumers indicated** they were likely to receive the vaccine if their HCP recommended it, depending on the vaccine.[35,a]

More than 50% of HCPs admitted that they did not always discuss the consequences of missed vaccinations with patients.[35,a]

All HCPs should develop counseling approaches that individualize the message concerning vaccines for each patient.[13]

Patients should be encouraged to accept the vaccinations they need and be advised of infection risks. Any concerns about vaccine efficacy and safety should be discussed, and any misconceptions should be respectfully corrected using facts to address myths.

Conversation tips[13]

[a]Surveys were conducted on 2,002 adult consumers and 200 HCPs in 2006. Surveys focused on general vaccination attitudes in the US as well as knowledge of 3 specific vaccines recommended for routine use in adults. Consumers were contacted by random digit dialing, and HCPs were randomly recruited from a national database of >16,000 primary care practices.

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Create communication for the group meant to receive it.[36]

All public health professionals and partners at the federal, state, and local levels are encouraged to:

- Use a health equity lens when framing information about health disparities
- Consider key health communications principles, such as using person-first language (eg, "a person with diabetes" instead of "a diabetic") and avoiding unintentional blaming
- Use preferred terms for select population groups and communities while recognizing that there isn't always an agreement on these terms
- Consider how communications, messages, and products are developed while looking for ways to improve health equity and inclusivity

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Key communication principles[37]

INSTEAD OF THIS...	TRY THIS...
Vulnerable groups	Groups that have been economically/socially marginalized
Marginalized groups	Groups that have been marginalized
Hard-to-reach communities	Communities that are underserved or have limited resource access
Underserved communities	Under-resourced communities
Underprivileged communities	People who are not equitably served by [programs, initiatives, infrastructure, or systems]
Disadvantaged groups	Groups experiencing disadvantage because of [reason]
High-risk groups	Groups placed at increased risk/put at increased risk of [outcome]
At-risk groups	Groups with higher risk of [outcome]
High-burden groups	People living with increased risk of [outcome] because of [reason]

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Health equity lens[38]

Intentionally examine the potential positive and negative impacts of proposed messages. Use a health equity lens in communication planning, development, and dissemination, to be inclusive, avoid bias and stigmatization, and effectively reach intended audiences.

This approach includes getting input from the intended audiences. When framing health disparities and discussing public health implications, you are encouraged to:

Avoid perpetuating inequities in communication. Long-standing systemic social and health inequities have put some population groups at increased risk of getting sick, having overall poor health, and having worse outcomes when they do get sick.

Recognize and reflect the diversity of the community being reached to help make public health programs, policies, and practices more likely to succeed.

Promote community engagement. This is foundational to developing culturally relevant, unbiased communication for health promotion, research, or policy making.

Remember that not all members of your audience of focus may have the same level of literacy. This includes both the ability to read and the ability to understand the content.

Note that health equity is intersectional. Individuals may have overlapping health and social inequities, as well as overlapping strengths and assets.

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Vaccine hesitancy and confidence

Health mistrust can cause poor provider-patient relationships and can lead to decreased adherence to public health recommendations.[39] HCPs must recognize misconceptions and knowledge gaps in the public.[13, 39-43]

HCPs should[44]:

- Strongly support the benefits of vaccination
- Address parental questions about vaccines
- Acknowledge concerns and correct misconceptions

Vaccine hesitancy refers to a delay in acceptance or refusal of vaccination, which[45]:

- Varies across time, place, and vaccine
- Is influenced by factors such as complacency, convenience, and confidence
- Encompasses patient and/or parental attitudes, beliefs, and behaviors

Vaccine confidence refers to the trust that patients, parents, and/or HCPs have in[46]:

- Recommended vaccinations
- Providers who administer vaccines
- Processes that lead to vaccine licensure and the recommended vaccination schedule

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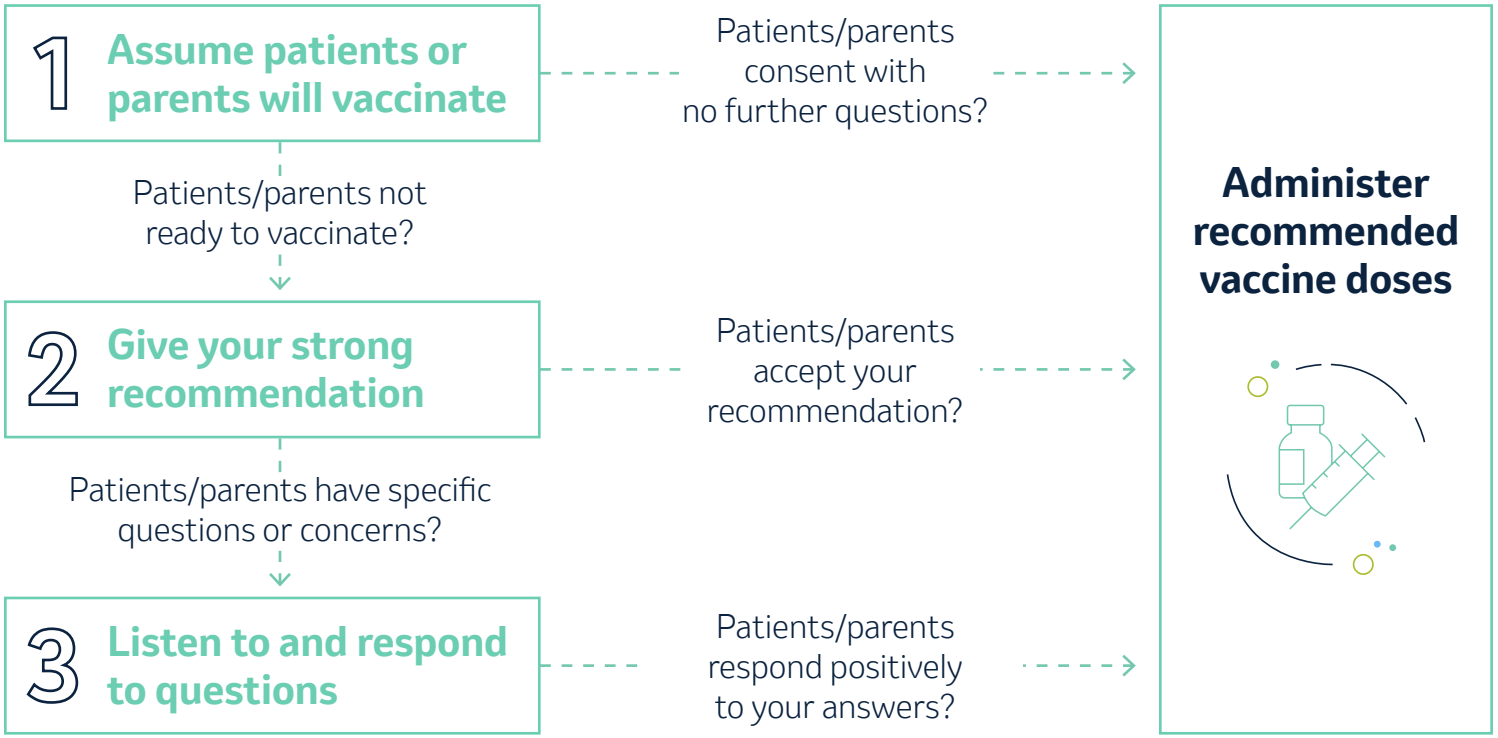
The presumptive approach[13]

Research has also shown the way a recommendation is presented makes a difference.

The presumptive approach to conversations with patients assumes that patients or parents will choose to vaccinate. The presumptive approach is more effective at gaining vaccine uptake than a participatory approach, which presents patients or parents with a decision to make.

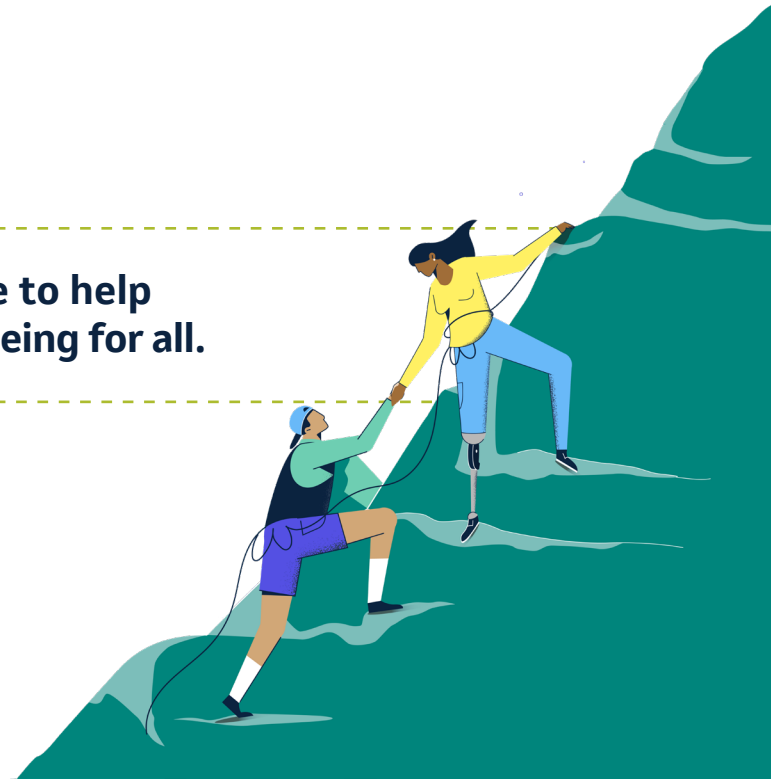


Conclusion

You can help work toward certain health goals established by Healthy People 2030 Initiative by ensuring that your staff are up-to-date on[5]:

- Methods of increasing vaccination coverage[13]
- Storage, handling, and administration of vaccines[21,26]
- Communication strategies for difficult conversations about vaccinations[13]
- Roles and strategies for creating an environment of continuous learning in your practice[30]

Together, we can improve vaccine uptake to help attain a healthier world and greater well-being for all.



Acronyms

AAP	American Academy of Pediatrics
ACIP	Advisory Committee on Immunization Practices
CCM	cold chain monitor
CDC	Centers for Disease Control and Prevention
CPR	cardiopulmonary resuscitation
DDL	digital data logger
EHR	electronic health record
FDA	Food and Drug Administration
HCP	health care providers
IIS	immunization information system
MDV	multidose vials
MFS	manufacturer-filled syringes
NCVIA	National Childhood Vaccine Injury Act
NVAC	National Vaccine Advisory Committee
P4VE	Partnering for Vaccine Equity
SDV	single-dose vials
SOP	standard operating procedure
TMD	temperature monitoring device
US	United States
VAERS	Vaccine Adverse Event Reporting System
VFC	Vaccines for Children
VIS	vaccine information statement

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