

Vaccine Administration Presentation Notes

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Title

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Disclosure Statements

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Objectives

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Why Do We Immunize Slide: We Immunize to Prevent Diseases

The Impact of Vaccines: This next slide is a chart that illustrates the impact of vaccines in the United States. Historically, Vaccines are one of the greatest success stories in public health as illustrated by this table.

The 2nd column of this chart shows the number of cases in the peak year of the 20th century (prevaccine) for each of the VPDs listed in the 1st column.

The 3rd column shows the number of cases reported in 2014.

The last column shows the percent reduction in those disease cases after the introduction of vaccine.

You can clearly see the impact vaccines have made. However, pertussis is the only vaccine-preventable disease with increasing case numbers and without a percent reduction greater than 90%.

Slide 6/7 Vaccine Administration Technique Training

Proper vaccine administration is a critical component of a successful immunization program. It is a key part of ensuring that vaccination is as safe and effective as possible.

Staff Training and Education

Improper administration of vaccines may result in injuries or prevent the vaccines from providing optimal protection. Staff Training and Education before administering vaccines, all personnel who administer vaccines should receive competency-based training validate knowledge and skills Integrate training into new staff orientation Annual education requirements when vaccine administration recommendations are updated when new vaccines are added to the inventory

Trainings should also be offered to temporary personnel who may be filling in on days when the facility is short staffed or helping during peak times such as flu season.

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Strategies for Communication

Communication is the **KEY** to a client's understanding about vaccines and being compliant in returning for recommended vaccines. Prior to administering vaccines, the nurse should first establish communication with the client or the parent/guardian. After assessing the client's record, discuss which vaccines are recommended for this visit.

The law under the 1986 National Childhood Vaccine Injury Act requires that parents or guardians be provided with the most current Vaccine Information Statements (VIS) published by CDC. This publication date is on the bottom corner of the sheet. You need to document that the parent was given the VIS by recording the publication date of each VIS given.

Identify any possible precautions and contraindications.

After asking if parent reviewed the VIS, ask if they have concerns and address each concern.

Have parent sign consent form.

Discuss what immunizations will be due on next visit and give the date.

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We will briefly discuss each of these key issues that should be considered when administering vaccines.

- Comforting Techniques
- Positioning
- Pain Control

For IM injections:

- The patient's limb should be positioned to allow relaxation of the muscle injected.
- For the deltoid, some flexion of the arm may be required.
- For the anterolateral thigh, some degree of internal rotation may be helpful.

Infants and Young Children:

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- Infants and young children may exhibit less pain behavior when held on the lap of a parent or caregiver. The parent should be instructed to hold the child securely.
- When the child is held on the mother's lap for an injection, her leg can be crossed over the leg of the child to hold the leg securely. The mother should hug the child with both arms to secure the child's arms.
- Older children may be more comfortable sitting on the parent's lap or on the edge of the exam table, hugging their parent's chest while the injection is being given.
- Adolescents and adults should be seated for immunizations. "Syncope may occur after immunization, particularly in adolescents and young adults. Personnel should be aware of pre-syncope manifestations and take appropriate measures to prevent injuries if weakness, dizziness, or loss of consciousness occurs. The relatively rapid onset of syncope in most cases suggests that health care professionals should consider observing adolescents for 15 minutes after they are immunized. Having vaccine recipients sit or lie down for 15 minutes after immunizations could avert many syncope episodes and secondary injuries. If syncope develops, patients should be observed until symptoms resolve. Syncope following receipt of a vaccine is not a contraindication to subsequent doses."
(Red Book 2012, p.20-24)

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Pain Control

Information referenced from the Red Book 2012, pages 23-24.

Parents should be educated about techniques for reducing injection pain or distress.

Truthful and empathetic preparation for injections is beneficial, using words that are explanatory without evoking anxiety---for example, "pressure", "squeezing", and "poking" rather than "pain", "hurt", and "shot". Techniques for minimizing pain can be divided into physical, psychological, and pharmacologic. **Note that routine preemptive administration of acetaminophen is not recommended.**

Physical

Skin-to-skin contact between mothers and their infants, breastfeeding, nonnutritive sucking on a pacifier, sitting on parent's lap or examination table edge and hugging their

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parent's chest, and stroking or rocking a child after an injection decreases crying and other pain behaviors. "If multiple injections are to be given, having different health care professionals administer them simultaneously at multiple sites (e.g. right and left anterolateral thighs), may lessen anticipation of the next injection. Allowing older children some choice in selecting the injection site may be helpful by allowing a degree of control."

Psychological

- For younger children, parents may soothe, stroke, and calm the child. For older children, parent demeanor affects the child's pain behavior. Humor and distraction techniques tend to decrease distress, whereas excessive parental reassurance, concern or apology tends to increase distress. Breathing and distraction techniques, such as telling stories, reading books, or use of music are effective.

Pharmacologic

- Topical applied agents may reduce the pain of injection. Topical anesthetics (eg, lidocaine/pilocaine). Because topical anesthetics require 30-60 minutes to provide adequate anesthesia, planning is necessary such as applying the cream before an office visit or immediately upon arrival.

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Infection Control

- Hand washing
- Gloving
- Equipment Disposal

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Vaccine Preparation

- Syringe/Needle Selection
- Inspecting Vaccine
- Reconstitution
- Filling Syringes

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Injections

It is important to use the correct route when administering vaccines. It is important to insert the needle at the appropriate angle to insure delivery to the muscle or subcutaneous tissue.

A decision on the site and needle size must be made for each person based upon age, volume of material to be administered, viscosity of material, size of muscle, and the depth into which the material is to be injected. (MMWR, General Recommendations)

The needle for IM injections should be long enough to reach the muscle mass and prevent vaccine from seeping into the subcutaneous tissue, but not so long to endanger underlying neurovascular structures and bone.

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Importance of Administering Vaccines Correctly

- Ensure Optimal vaccine efficacy
- Decrease localized and systemic reactions
- Decrease pain

Preparing and administering medications requires accuracy by the nurse. The nurse must pay full attention to the procedure and try not to do other tasks simultaneously. Accuracy is greatest when the nurse observes the “five rights” of drug administration.

Perry and Potter (1998). *Clinical Nursing Skills and Techniques* St. Louis, MO: Mosby.

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Routes of Administration

- Oral (PO)
- Intranasal (IN)
- Subcutaneous (SC)
- Intramuscular (IM)
- Intradermal (ID)

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It is important to use the correct route when administering vaccines. It is important to insert the needle at the appropriate angle to insure delivery to the muscle or subcutaneous tissue.

PO: Oral (PO) Route - Rotavirus vaccines (RV1/Rotarix, RV5/RotaTeq) and oral typhoid (TY21a/Vivotif) are the only U.S.-licensed vaccines that are administered by the oral route. RV1/Rotarix requires reconstitution prior to oral administration. Oral vaccines should generally be administered prior to administering injections or performing other procedures that might cause discomfort. Administer the liquid slowly down one side of the inside of the cheek (between the cheek and gum) toward the back of the infant's mouth. Care should be taken not to go far enough back to initiate the gag reflex. Never administer or spray (squirt) the vaccine directly into the throat.

IN: Intranasal- Intranasal Route -The live attenuated influenza vaccine (LAIV, FluMist) is currently the only vaccine administered by the nasal route. The patient should be seated in an upright position with head tilted back. Instruct the patient to breathe normally. The provider should gently place a hand behind the patient's head. The tip of the nasal sprayer should be inserted slightly into the naris. Half of the contents of the sprayer (0.1 mL) are sprayed into the nostril; the dose-divider clip is then removed and the procedure is repeated in the other nostril.

The dose does not need to be repeated if the patient coughs, sneezes, or expels the dose in any other way.

SC: SC injections can be administered at a 45 degree angle into the anterolateral aspect of the thigh or upper, outer triceps area by inserting the needle in a pinched-up fold of skin and tissue. The 2012 Red Book (p.21-23) states the following regarding the need to aspirate.

“Aspiration before injection of vaccines or toxoids (i.e. pulling back on the syringe plunger after needle insertion, before injection) is not recommended, because no large blood vessels are located at the preferred injection sites, and rapid plunge may reduce pain.”

IM: For (IM) injections, the choice of site is based on the volume of the injected material and size of the muscle. The needle should be directed at a 90 degree angle. Needles used

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for IM injections should be long enough to reach the muscle mass to prevent the vaccine from seeping into subcutaneous tissue and, therefore, minimize local reactions and not so long as to involve underlying nerves, blood vessels, or bone. Ordinarily, the upper, outer aspect of the buttocks should not be used for active immunizations, because the gluteal region is covered by a significant layer of subcutaneous fat and because of the possibility of damaging the sciatic nerve. However, clinical information on use of this area is limited. Because of diminished immunogenicity, hepatitis B and rabies vaccines should not be given in the buttocks at any age. People, especially adults, who were given hepatitis B vaccine in the buttocks should be tested for immunity and re-immunized if antibody concentrations are inadequate.

ID Intradermal: • Intradermal (ID) Route. Fluzone Intradermal is the only U.S.-licensed vaccine that is administered by the intradermal route. It is approved only for use in persons 18 through 64 years of age. This Fluzone formulation is not the same as intramuscular formulations of inactivated influenza vaccine (IIV). Other IIV formulations should NOT be administered by the intradermal route. -Site - The site of administration is the deltoid region of the upper arm. The patient should be seated with the arm bent at the elbow and the hand on the hip to ensure that the site of administration is prominent. -Technique -The syringe should be gently shaken before the needle cap is removed. Hold the syringe between the thumb and the middle finger. Using a short quick motion insert the needle perpendicular to the skin into the deltoid region of the upper arm. Push on the plunger with the index finger without aspirating. Because the needle is very short the vaccine will be delivered just under the skin into the dermal layer. This vaccine should NOT be administered into the volar aspect of the forearm or by the intradermal technique used to administer a tuberculin skin test. Intradermal (ID) PPD ($\frac{1}{4}$ - $\frac{3}{4}$ " volar surface 25-27 gauge of forearm Fluzone (ID) 18-64Yrs; Deltoid area

Slide 23-26 Special Situations

Multiple Injections: When multiple vaccines are administered, separate sites should ordinarily be used if possible, two vaccines may be given in the same limb at a single visit, the thigh is the preferred site for infants and smaller children, distance for separating two injections is arbitrary but should be sufficient (1-2 inches apart) so that

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local reactions are unlikely to develop and multiple vaccines should not be mixed in a single syringe unless specifically licensed and labeled for administering in one syringe

Bleeding Disorders- Prior to administration of IM vaccines the patient or family should be instructed about the risk of hematoma formation from the injection. If the patient periodically receives antihemophilia or similar therapy, IM vaccine administration should be scheduled shortly after such therapy is administered. A 23-gauge or finer needle should be used and firm pressure applied to the site for at least 2 minutes after injection. The site should not be rubbed or massaged. Patients receiving anticoagulation therapy presumably have the same bleeding risk as patients with clotting factor disorders and providers should follow the same guidelines for intramuscular administration.

Non-standard administration: CDC discourages deviating from the recommended route, site, dosage, or number of doses for any vaccine. Deviation can result in reduced protection and increase the risk of an exaggerated local reaction.

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Pre-Drawing Vaccines

Problems Associated with Pre-drawing Vaccines

CDC discourages pre-drawing vaccines and has identified the following problems associated with this practice to administration errors.

Pre-drawing vaccines leads to vaccine waste and increases the risk of vaccine storage under inappropriate conditions.

Most syringes are designed for immediate administration and not for vaccine storage. Bacterial contamination and growth can occur in syringes with pre-drawn vaccine that do not contain bacteriostatic agents.

No stability data are available for vaccines stored in plastic syringes. Vaccine components may interact with the polymers in plastic syringes over time potentially reducing vaccine potency.

An individual should only administer a vaccine he or she has prepared and drawn up. If a vaccine is drawn up by one person and then administered by a different person, the person administering the vaccine cannot be sure of the composition and sterility of the dose. This is a quality control and patient safety issue and a best practice standard of medication administration.

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Influenza Clinics and Pre-drawing Vaccines

Vaccine manufacturers do not recommend that influenza vaccines be pre-drawn in advance of a large influenza vaccination clinic because there are no data on the stability of vaccines stored in syringes that have been filled by providers. CDC discourages this practice for the reasons noted in the previous section. As an alternative to pre-drawing vaccines, CDC recommends using manufacturer-filled syringes for large immunization events such as community influenza clinics. These syringes are designed for both storage and administration.

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Management of Adverse Events: Maintain an accessible emergency kit, staff certified in CPR, conduct mock emergency drills and report any adverse events on the Vaccine Adverse Events Reporting System (VAERS). VAERS is a national vaccine safety surveillance program co-sponsored by the Centers for Disease Control and Prevention and the Food and Drug Administration. Also, the National Vaccine Injury Compensation Program (NVICP) provides compensation to individuals found to be injured by or have died from certain childhood vaccines.

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Documentation: National Childhood Vaccine Injury Act requires documentation of: date of administration, manufacturer, lot number, name and address, and title of person administering vaccine, adverse effects (if any), and publication date of VIS (Vaccine Information Statement). It is also required that client's personal immunization record be documented in GRITS.

The 7 Rights of Vaccine Administration

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Avoiding Vaccine Errors

- When possible, involve staff in selection of vaccine products
- Keep current reference materials on each vaccine
- Rotate vaccines
- Consider the potential for product mix-up

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- Triple check your work

Test Your Knowledge Questions

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Vaccine Injury Compensation Program/VAERS

Slides 42

Recommended vaccines for healthcare workers/personnel; Considerations for HCW Immunization plan/policy for maintaining HCW immunization records, catch-up programs for current employees and policies for newly hired workers, work restriction policies for susceptible workers after exposure, management and control of outbreaks and options for refusal of vaccination by employees.

Slides 43-44

Georgia Immunization Program Resources and other Internet Immunization related Resources