# Vaccine Administration Strategies

Many patients (especially children) have anxiety and fears around needles and vaccine administration.[1] A positive vaccination experience can help reduce anxiety, increase vaccination rates, and may help decrease the risk of a an ongoing general fear of needles and injections that can impact future healthcare visits.[1] The following is a checklist of strategies to help reduce a patient's fears, make the injections less painful, and prevent injuries.[2]

| Topic/Issue | Suggestions/Pertinent Information |
|---|---|
| **Strategies to Minimize Patient Anxiety** | ☐ Be calm, collaborative, well-informed, and comfortable with immunizing patients.[2] Maintain a positive attitude throughout.[1]<br>☐ Let patients and caregivers know what will happen, how it will feel, and what they can do. Provide information in advance.[1]<br>☐ Use neutral phrases like "Here I go." rather than "Here comes the sting."[2]<br>☐ Be truthful to promote trust.[2] Do not tell them it won't hurt. Tell them they will feel a pinch but that it won't hurt for long.[3]<br>☐ Ensure privacy to help decrease anxiety.[2]<br>☐ If more than one vaccine is being given, administer the most painful vaccine last (e.g., *M-M-R II*, *Prevnar*).[1]<br>☐ Let caregivers know that their behavior can influence a child's response and distress. Give them information and tools to help them remain calm.[1] Let caregivers know they should never threaten or scare a child about injections.[3]<br>☐ Make sure caregivers remain present with children, especially if less than ten years old.[1]<br>o Infants and children should be held by their caregivers in a position that is most comfortable for them (e.g., sitting on their laps, in a bear hug [can help to hold their arms still], etc).[1,2]<br>o If standing, have caregivers brace themselves (e.g., against a table or a desk) to prevent accidental falls.[1]<br>☐ Do not have patients (including infants and children) lie down for injections.[1]<br>o If patients have a history of fainting, you can consider having them lie down for the injection (when possible).[2]<br>☐ Do not forcibly restrain a child as this will increase their fear.[1,2]<br>☐ Consider having parents hold neonates with skin-to-skin contact to reduce acute stress.[1]<br>☐ Recommend breastfeeding infants before, during, and/or after injections.[1,2,18] This can reduce stress with physical comfort, sucking distraction, and sweet-tasting ingestion.[1] Pacifiers or bottle feeding throughout may provide some benefit as well.[2,18]<br>☐ Use a variety of distractions with children (e.g., toys such as bubbles, pop-up books) or conversation (ask about pets, school).[2]<br>o Encourage caregivers to bring a child's favorite toy, book, blanket, other comfort item, or smartphone from home.[3,18]<br>o Have caregivers tell stories, cuddle, sing, or talk softly with the child.[3]<br>o Focus on and interact with the child throughout the procedure. Try to keep their attention on the distraction. Praise them for engaging in the distractions.[1] Offer fun, colorful bandages or a lollipop (with parent permission) as a reward.<br>☐ As a last resort, consider and discuss deferring pediatric vaccines to another day if your safety or the child's safety is at risk.<br>☐ Consider referring children and adults with severe fear or phobia of needles (which interferes with vaccination despite the use of anxiety and pain-reducing strategies) for cognitive behavioral therapy.[19] |

| Topic/Issue | Suggestions/Pertinent Information |
|---|---|
| **Strategies to Minimize Injection Pain** | ☐ Consider **pre-application** of topical anesthetic creams, gels, or patches if there is significant anxiety or fear of pain.[1,2]<br>o Timing of application (typically one hour) and cost vary by product.[1,2]<br>o Make sure patients apply to correct injection sites (e.g., deltoid of both arms if applicable).[1]<br>☐ Recommend sucrose (e.g., sugar water, *TootSweet*) in infants less than two years if they are not breastfed during vaccination.[1]<br>o The dose is 2 mL of a 24% to 50% solution one to two minutes before the injection. Parents can mix one teaspoon (or one packet) of white sugar with two teaspoons (10 mL) of water.[1,18]<br>o Alternatively, give rotavirus oral vaccine first (if using) as it contains sucrose.[1]<br>☐ Generally, do not recommend topical ethyl chloride and other vapocoolants due to lack of proven effectiveness.[5]<br>☐ Do not recommend oral analgesics (e.g., acetaminophen) prior to injections as they are unlikely to help and it has been suggested that they could decrease the immune response.[2,5-7] Save for after the injections for fever or discomfort.[2]<br>☐ Have the patient keep their arm muscle loose, encourage slow deep breaths, and then give shot during exhalation.<br>o Have children blow out into a toy pinwheel, party blower, or bubble blower.[8]<br>o Adults can give a slight cough as you inject the vaccine but be sure to avoid arm movement and breath holding.[2]<br>☐ DO NOT warm the vaccine (rubbing between your hands), rub or pinch the injection site (manual stimulation), rub the skin adjacent to the injection site, or apply pressure or cold (e.g., ice packs) prior to the injection.[13]<br>☐ Do not pull back the plunger with IM administration.[1,2,4] It is unnecessary, lengthens injection time, and increases pain.[1,2]<br>☐ Be aware of devices marketed to reduce the pain of injections. For example:<br>o The *Buzzy* (~$40) device may reduce pain with vibration and cold [Evidence Level B-1].[9,10]<br>o The *ShotBlocker* is a disposable disk that surrounds the injection site to "saturate the sensory signals." Studies are small and many **do not** show decreased pain in patients getting injections [Evidence Level B-1].[11,12] |
| **Strategies to Reduce Risk of Injury** | ☐ Choose the proper needle size based on route of administration and your patient (i.e., age and weight).<br>o A needle that is too short causes more pain, may decrease efficacy, and increases the risk of skin reactions.[14,16]<br>o A needle that is too long can hit bone or a nerve, increasing the risk of pain and injury.[14,16]<br>☐ Position yourself correctly (sit if the recipient is sitting, or kneel, elevate, etc) to help get to eye level to ensure the injection is at a 90-degree angle into the correct area of the deltoid.[15,21]<br>☐ Avoid lowering a patient's shirt down over their shoulder to reduce the risk of injecting too high.[17]<br>☐ When injecting IM vaccines into the deltoid (adults, usually children ≥3 years), **always** inject into the central, thickest part of the muscle.[20] This animated image is an example of how to locate the proper injection area.<br>o Injections that are too high (i.e., upper third of the arm) have been associated with severe shoulder injuries (e.g., rotator cuff tears, bursitis, tendonitis).[4,15]<br>o Shoulder Injury Related to Vaccine Administration (SIRVA) is rare. It occurs when an IM vaccine is administered too high on the arm, into the shoulder joint instead of the deltoid muscle.[14-16] Symptoms (e.g., permanent pain, weakness, and impaired mobility) typically start about 48 hours after injection.[15,16]<br>☐ Use caution with the "Three Finger Rule" (i.e., inject IM vaccines three finger widths below the upper crest of the arm or acromion process) to find the right spot for injection. This "rule" won't always guide you low enough on the arm. |

*Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.*

## *Levels of Evidence*

In accordance with our goal of providing Evidence-Based information, we are citing the **LEVEL OF EVIDENCE** for the clinical recommendations we publish.

| Level | Definition | Study Quality |
|---|---|---|
| **A** | Good-quality patient-oriented evidence.***** | 1. High-quality RCT<br>2. SR/Meta-analysis of RCTs with consistent findings<br>3. All-or-none study |
| **B** | Inconsistent or limited-quality patient-oriented evidence.***** | 1. Lower-quality RCT<br>2. SR/Meta-analysis with low-quality clinical trials or of studies with inconsistent findings<br>3. Cohort study<br>4. Case control study |
| **C** | Consensus; usual practice; expert opinion; disease-oriented evidence (e.g., physiologic or surrogate endpoints); case series for studies of diagnosis, treatment, prevention, or screening. | |

***Outcomes that matter to patients** (e.g., morbidity, mortality, symptom improvement, quality of life).
**RCT** = randomized controlled trial; **SR** = systematic review
[Adapted from Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *Am Fam Physician* 2004;69:548-56. http://www.aafp.org/afp/2004/0201/p548.pdf.]

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