Tips for Procedures in Tots

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Tips for Procedures in Tots

CDC vaccine guidelines

1983

2016

Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2016.

FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE (FIGURE 2). These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1 to determine minimum interval between doses. See the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.

This schedule includes recommendations in effect as of January 1, 2016. Any dose not administered at the recommended age or time may be given at any time thereafter. The routine immunization schedule is in effect for all children, 0 through 18 years of age, unless otherwise indicated in footnotes. Any child who does not receive all recommended doses should complete the schedule as soon as possible. Immunization status can be determined by chart review, patient recall, or other methods. This schedule is based on the Advisory Committee on Immunization Practices (ACIP) recommendations available online at http://www.cdc.gov/vaccines/recs/schedules/default.htm. All recommendations are to be read in conjunction with the footnotes to figure. No recommendations for health care providers include medications. This schedule is intended for use by health care providers and includes the dosage and administration of vaccines for persons aged 0 through 18 years. The recommendation for infant and young children is the same as the recommendation for persons aged 1 through 18 years. This schedule is published annually to provide the most current recommendations. The recommendations are reviewed and updated annually. For an updated version of this table, please visit the CDC web site for the most recent recommendations and updates. The schedule is based on the recommendations of the Advisory Committee on Immunization Practices (ACIP) and is consistent with recommendations of the American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP) and other professional organizations. For information about immunization coverage, see the National Immunization Survey (NIS) reports at http://www.cdc.gov/nhsn/pdfs/niip/nis-report-2013-300.pdf. For information about the status of vaccines recommended for use in the United States, see the Vaccine Use Reports at http://www.cdc.gov/vaccines/vu-facts.html. For information about the status of vaccines recommended for use in the United States, see the Vaccine Use Reports at http://www.cdc.gov/vaccines/vu-facts.html. For information about the status of vaccines recommended for use in the United States, see the Vaccine Use Reports at http://www.cdc.gov/vaccines/vu-facts.html. For information about the status of vaccines recommended for use in the United States, see the Vaccine Use Reports at http://www.cdc.gov/vaccines/vu-facts.html.

NOTE: The above recommendations must be read along with the footnotes of this schedule.

1983 childhood immunization schedule

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Tips for Procedures in Tots

Why Kids Today are More Afraid of Shots

Fig. 1 Scheduled vaccines by year in the USA (cdc.gov, Eliot J 1955) compared to reported needle fear in 18 studies from 1958 – 2015. Of 8459 subjects, 36% were under the age of 18, and average birth year ranged from 1931 to 2003. ©2016 Baxter AL info@mmjlabs.com
Tips for Procedures in Tots
Creating a calm and controlled setting

- **Distractors**
  - iPad, cellphone – videos, games, viewing photos
  - Music
  - Bubbles

- Prepare everything you need on tray outside of room
- Keep tray covered and out of view of patient and family
- Limit negotiation time
- Explain the procedure step by step with age appropriate language
- Securing the patient on the exam table
- Praise the child
- Rewards at end of procedure (ie stickers, lollipops)
Tips for Procedures in Tots
*Cantharidin for Molluscum contagiosum*

- Compounded vs commercial preparation
- **Set expectations**
  - Handouts
  - Photos of expected blistering
  - Associated stinging, burning after treatment
  - Temporary pigmentary changes
  - Pock scars
- **Locations**
  - Face – avoid proximity to eyes
  - Axillae, inguinal – treating multiple lesions can be painful!
- **Hypersensitivity reactions**
  - Gianotti-Crosti-like reaction
  - Sterile abscess
- **Post-procedure discomfort**
  - Distraction
  - Ice packs
  - Acetaminophen, ibuprofen
Tips for Procedures in Tots

Cantharidin for molluscum

**Molluscum Contagiosum**

Molluscum contagiosum is a common viral infection that causes small bumps on the skin.

Molluscum is very common in children, although it can also occur in adults. It is spread by direct skin-to-skin contact or by contact with infected items. The virus enters the skin and causes the growth of a molluscum body.

**Symptoms**

- Molluscum lesions begin as dome-shaped, shiny bumps with a central dimple or “pit.”
- They are pink or skin-colored, and may be located on the face, neck, shoulders, and buttocks.
- The bumps can range from 1 to 20, and are often grouped together.
- The skin around the molluscum may become pink, red, and itchy.

**Diagnosis**

Doctors can typically recognize molluscum by looking at the skin. Occasionally, a biopsy is done to confirm the diagnosis.

**Management**

- Be sure to keep the bumps clean, as the virus can spread easily.
- Avoid scratching or picking at the bumps.
- If there is an itchy rash or eczema, apply a topical steroid (over-the-counter hydrocortisone or prescription) for 2 weeks.
- Avoid towel sharing and skin-to-skin contact while bathing with siblings.
- Avoid sharing eating or sexual contact, with areas that have molluscum.
- If the molluscum is on the nose, a common home remedy is to apply a toothbrush to the bump.

**TREATMENT WITH CANTHARIDIN**

The normal action of this medication is to form a blister underneath the molluscum. The blister formation causes sloughing of the molluscum body. On occasion, a blister may be painful, inflamed, or itchy.

The following are guidelines on what to expect and what to do:

- As a general rule, patients can expect the following:
  - **WASH OFF AT:** ***
  - **2 HOURS:** Wash off medication with soap and water. This is important because this amount of time will control the amount of blistering. If there is a stinging sensation prior to 2 hours, wash off the medication immediately.
  - **4 HOURS:** Mild discomfort may occur; control with bathing and medication. (see below)
  - **24 HOURS:** Blisters usually fully formed. Occasionally, there may be some blood in the blister fluid; don’t be alarmed at this.
  - **4 DAYS:** Crusted blisters fall off leaving superficial abrasions. Medication may be needed to control night time itching.
  - **7 DAYS:** Healed with temporary residual redness. Any resistant lesions can be treated.

**Possible Side Effects of Cantharidin treatment:**

1. Mild to moderate pain - Please use Tylenol (acetaminophen) for this.
2. Burning sensation - Please use cold water or ice water compresses to relieve this.
3. Itching/Eczema
   - You may use antihistamine ***, *** ml every *** hours to help control the itchiness.
   - Any itchy rash or eczema should be treated. Please apply *** twice daily to relieve itch.
4. Post treatment hypo-pigmentation, or hyperpigmentation (temporary loss of normal pigmentation or slight darkening often occurs, but no scarring)
   - May take weeks / months to resolve. No treatment needed.
5. Recurrence
   - If molluscum remain, or if new molluscum appear, we can repeat the treatment in a few weeks.
   - If you have any additional questions or concerns, please call your physician at 551.996.8697
# Tips for Procedures in Tots

**Topical anesthetics**

**TABLE 1.**

<table>
<thead>
<tr>
<th>Uses of EMLA and Other Topical Anesthetics for Dermatologic Procedures in Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before lidocaine injection (&quot;prenumbing&quot;)</td>
</tr>
<tr>
<td>Molluscum contagiosum curettage</td>
</tr>
<tr>
<td>Intrallesional injection of corticosteroids (for alopecia areata, keloids/hypertropic scars, cysts, etc)</td>
</tr>
<tr>
<td>Laser surgery (pulsed dye, KTP, Er:YAG, diode, others)</td>
</tr>
<tr>
<td>Tissue debridement including ulcerated hemangiomas</td>
</tr>
<tr>
<td>Before cryotherapy of mucosal and nonmucosal lesions</td>
</tr>
<tr>
<td>Verruca vulgaris paring</td>
</tr>
<tr>
<td>Trichloroacetic acid/podophyllin application (eg, condyloma acuminatum)</td>
</tr>
</tbody>
</table>

*Abbreviations: EMLA, eutectic mixture of local anesthetics; KTP, potassium-titanyl-phosphate; Er:YAG, erbium:yttrium-argon-garnet.*
Tips for Procedures in Tots

**EMLA cream**

- **Eutectic mixture of local anesthetics**
  - 2.5% lidocaine/2.5% prilocaine

- **Apply under occlusion 60-120 minutes prior to procedure**
  - Shorter for mucosal, genital skin
  - Diseased skin

- **Maximum recommended dose**
  - 10g with 1-2g/cm2

- **Obtain maximum depth of 5mm of analgesia**

- **Patch formulation**

Buckley MM, Benfield P. Drugs 1993;46(1):126-51
Calobrisi MD. Pediatrics 1998; Mar;101(3 PT 1):471-3
Tips for Procedures in Tots

**EMLA cream**

- **Local effects**
  - Transient erythema, blanching, edema
  - Eye irritation – corneal de-epitheizlization
  - Allergic contact dermatitis (prilocaine)

- **Petechial and purpuric eruption**

- **Methemoglobinemia (prilocaine)**
  - Mottled, pale skin, perioral and acral cyanosis, poor peripheral perfusion
  - Use with caution in children < 3yrs
  - Incomplete maturation of NADH-methemoglobin reductase system

References:

Tips for Procedures in Tots

Liposomal lidocaine

- Liposomal lidocaine 4%
- Over the counter
- 30 minutes before procedure +/- occlusion
- Longer duration of analgesia vs EMLA
- Does not contain prilocaine
Tips for Procedures in Tots

*Topical anesthetic failure*

- Application with air-permeable bandages or gauze dressings
- Aggressively rubbing cream into skin in absence of dressing
- Inadequate application time
- Inadequate amount of cream
- Leakage of EMLA from occlusive dressing

Tips for Procedures in Tots

Iontophoretic devices

- **Numby**
- Takes advantage of polarity of lidocaine molecule
- Low voltage electric current applied to skin to drive absorption of lidocaine solution or lidocaine invested patch
- More rapid onset of anesthesia (5-10 min)
- Excellent penetration of cutaneous anesthesia, minimal pain, no need for needle sticks

Limitations

- Anesthesia limited to small patches of skin
- Expense
- Mild discomfort associated with electric current

Tips for Procedures in Tots

**Vibration and cooling**

- Vibration physiologically mediates transmission of painful stimuli under Melzack and Wall’s Gate Control Theory of pain.

- Vibration and temperature may suppress transmission of painful stimuli when applied proximal to procedure site.

- **Buzzy**
  - Solid ice pack
  - Secure with velcro or tourniquet
  - Vibration remains on: 15-30 seconds

Tips for Procedures in Tots

Injectable lidocaine

- 1% solution (10mg/mL)
- Epinephrine
  - Decreases rate of lidocaine absorption
  - Increases duration of action
  - Decreases risk of systemic toxicity
- Maximum recommended dose
  - 1% lidocaine - 2.5-5mg/kg or 0.5mL/kg
  - 1% lidocaine + with epinephrine - 7 mg/kg or 0.7mL/kg
- Maximum volume for 4 kg neonate
  - 1% lidocaine => 2 ml
  - 1% lidocaine with epinephrine => 2.8 ml
Tips for Procedures in Tots

Injectable lidocaine

- **Best results**
  - Buffering with sodium bicarbonate
    - 1:10 ratio of 8.4% sodium bicarbonate (1 mEq/mL)
    - Do not use for cultures
  - Pre-warmed
  - Slowly injected

- **Avoid epinephrine in penis, distal digits**

- **Lidocaine toxicity**
  - Allergic reactions are rare
  - CNS – drowsiness, circumoral numbness, nausea, vomiting
  - Increasing doses – nystagmus, diplopia, tremors, convulsions, respiratory failure, death

Tips for Procedures in Tots
Non-anesthetic techniques

- **Ethyl chloride**
  - Vapocoolant sprays
  - Transient anesthesia
  - No systemic toxicity
  - No risk of methemoglobinemia

- **Oral sucrose**
  - NICU – procedures, circumcision
  - Anterior tip of tongue, dipping pacifier into solution
  - Mechanism of action
    - Activation of sites in brain that decrease pain perception
    - Release of chemicals so babies have less feeling of pain

Cohen Reis E, Holubkov R. Pediatrics 1997;100(6):E5
Tips for Procedures in Tots

Pain management

- Painful ulcerated/eroded conditions
  - Ulcerated hemangioma
  - Lichen sclerosus flare
  - Genital ulcers
  - Hidradenitis suppurativa

- Lidocaine 5% ointment 1:1 petrolatum
  - Apply thin film up to QID
  - Before bathing or cleansing affected area

- Acetaminophen or ibuprofen

- Salt or baking soda in bath water

- Thick layer of petrolatum on non-stick dressing
Tips for Procedures in Tots
*Risks of General Anesthesia*

❖ **Clinical settings**
  ❖ Skin biopsy for diagnosis
  ❖ Magnetic resonance imaging
  ❖ Excision of congenital melanocytic nevi
  ❖ Pulsed dye laser treatment of facial port wine stain

❖ **Uncooperative child, unable to tolerate an “awake” procedure**

❖ **Individual assessment – age, maturity**

❖ **Lesions that may have superior cosmetic result with early surgery**

❖ **Lesions that may affect psychosocial development**
Tips for Procedures in Tots
*Risks of General Anesthesia*

- **Glutamate and gamma-aminobutyric acid**
  - Neurotransmitters important for normal brain development

- **Synaptogenesis => rapid brain growth**
  - Starts during 3\textsuperscript{rd} trimester
  - Mostly complete by 2-3 years of age

- **Neural circuit development**
  - Slows after age 2-5 years
  - Continues throughout childhood and adolescence

- **All anesthetic and sedatives used in infants and children are believed to alter neurotransmitter receptors to varying degrees**
FDA partnered with International Anesthesia Research Society (IARS)

SmartTots

(Strategies for Mitigating Anesthesia-Related neuroToxicity in Tots)

Coordinate and fund research

Resource for physicians and parents
FDA review results in new warnings about using general anesthetics and sedation drugs in young children and pregnant women

Safety Announcement

[12-14-2016] The U.S. Food and Drug Administration (FDA) is warning that repeated or lengthy use of general anesthetic and sedation drugs during surgeries or procedures in children younger than 3 years or in pregnant women during their third trimester may affect the development of children’s brains.
Tips for Procedures in Tots

Consensus statement highlights

- Current concerns raised by animal studies
- Effects of anesthetics in children is unknown
- Some studies suggest there could be concerns in children
- Inability to form solid conclusions with limitations of data/current information
- Need for better research and studies
Tips for Procedures in Tots
Risks of General Anesthesia

- Pregnant and young animal studies
  - Use of general anesthetic and sedation drugs for more than 3 hours
  - Widespread loss of nerve cells in the brain
  - Result in long-term effects on animals’ behavior or learning

- Infants and children
  - Some studies support findings from previous animal studies
  - Particularly after repeated or prolonged exposure to these drugs early in life
  - Possibility of other underlying factors (i.e., underlying medical condition)

- Single, relatively short exposure to general anesthetic and sedation drugs in infants or toddlers is unlikely to have negative effects on behavior or learning
Tips for Procedures in Tots

Prospective Studies

- **Questions**
  - Is anesthesia neurotoxic to developing human brain?
  - What are the high risk age groups?
  - What type of anesthesia/sedation is safe?
  - What length of anesthesia/sedation is safe?

- **Prospective studies**
  - MASK: Mayo Anesthesia Safety in Kids
  - GAS: General Anesthesia for Effects on Neurodevelopmental Outcome and Apnea in Infants
  - PANDA: Pediatric Anesthesia NeuroDevelopment Assessment project
Original Investigation

Association Between a Single General Anesthesia Exposure Before Age 36 Months and Neurocognitive Outcomes in Later Childhood

Lena S. Sun, MD; Guohua Li, MD, DrPH; Tonya L. K. Miller, MD; Cynthia Salorio, PhD; Mary W. Byrne, PhD, MPH; David C. Bellinger, PhD, MSc; Caleb Ing, MD, MS; Raymond Park, MD; Jerilynn Radcliffe, PhD; Stephen R. Hays, MD, MS; Charles J. DiMaggio, PhD; Timothy J. Cooper, PsyD; Virginia Rauh, ScD; Lynne G. Maxwell, MD; Ahrim Youn, PhD; Francis X. McGowan, MD

- Sibling-matched observational cohort study
- Single anesthesia exposure children under 3 years
  - Healthy children for hernia repair
  - Mean duration of anesthesia 84 minutes
- Primary outcome
  - Measure global cognitive function (IQ) at 10.6 years
- Secondary outcome
  - Measure domain-specific neurocognitive functions and behavior at ages 8 to 15 years
- No statistically significant difference noted between the groups
Neurodevelopmental outcome at 2 years of age after general anaesthesia and awake-regional anaesthesia in infancy (GAS): an international multicentre, randomised controlled trial

Andrew J Davidson, Nicola Disma, Jurgen C de Graaff, Davinia E Withington, Liam Doris, Graham Bell, Robyn Stargatt, David C Bellinger, Tibor Schuster, Sarah J Arnup, Pollyanna Hardy, Rodney W Hunt, Michael J Takagi, Gaia Giribaldi, Penelope L Hartmann, Ida Salvo, Neil S Morton, Britta von Ungern Sternberg, Bruno Guido Locatelli, Niall Wilton, Anne Lynn, Joss J Thomas, David Polaner, Oliver Bagshaw, Peter Szmk, Anthony R Absalom, Geoff Frawley, Charles Berde, Gillian D Ormond, Jacki Marmor, Mary Ellen McCann, for the GAS consortium*

- Single short exposure (54 min) vs awake-regional anesthesia for hernia repair
- Children younger than 60 weeks born more than 26 weeks gestation
- **Primary outcome**
  - Wechsler Preschool and Primary Scale of Intelligence Third Addition (WPPSI-III)
  - Full Scale Intelligence Quotient (IQ) at age 5 years
- **Secondary outcome**
  - Composite cognitive score of Bayley Scales of Infant and Toddler Development III at age 2 years
- 238 children awake-regional anesthesia, 294 general anesthesia
- At 2 years, no difference in Bayley III development scores between 2 study arms
- Awaiting primary WPPSI-III IQ outcome measure at age 5 years

Tips for Procedures in Tots
Counseling families on general anesthesia
Physician responsibilities

- Become knowledgeable about issue
- Be able to discuss differences between animal studies and studies in children and uncertainty of effect
- No data to suggest that one medication is safer
- Make clear why procedure is being recommended and the necessity of anesthesia/sedation for child’s care
- Discuss timing of procedures
Tips for Procedures in Tots

Patient Handouts/Educational videos

- Acne
- Alopecia Areata
- Atopic Dermatitis (Eczema)
- Hemangiomas
- Isotretinoin
- Moles & Melanoma
- Molluscum
- Nevus Sebaceous
- Pulsed Dye Laser for Port-Wine Stains
- Pediatric Skin Cancer
- Perioral Dermatitis
- Propranolol for Infantile Hemangiomas
- Psoriasis
- Scabies
- Sun Protection
- Tina Infections
- Vitiligo
- Warts

Handouts coming soon:

- PAPULAR URTICARIA
- EPIDERMAL NEVI
- HYPERHIDROSIS
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