

Anesthesia and Intradermal Injections

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FINANCIAL DISCLOSURE

- I do not have any relevant financial relationships to disclose.



Objectives

- Definition
- Anesthesia vs. analgesia
- Forms of anesthesia
- Focus on local anesthesia
- Medications, allergies, and contraindications
- Anaphylaxis
- Approaching supplies and set up
- Ways to minimize pain
- Performing
- Post-injection

Anesthesia

- Temporary loss of sensation for medical purposes in a controlled environment

- Concisely, “without feeling or sensation”

Anesthesia

- “an”, as a Greek prefix means “without” or “lacking”
- “esthesia”, as a Greek suffix means “feeling” or “sensation”

Analgesia

- Temporary alleviation of pain through chemical means usually without loss of consciousness
- Concisely, without pain or capacity to feel pain

Analgesia

- “an”, as a Greek prefix means “without” or “lacking”
- “algesia”, as a Greek suffix means “pain”

Anesthesia vs. Analgesia

- Anesthesia is with a lack of total sensation
 - Where analgesia is with a lack of pain sensation
- *All anesthetics provide analgesia
 - While not all analgesics provide anesthesia*

Anesthesia vs. Analgesia

- Patients are often awake while utilizing analgesics aside from certain scenarios, combination with other drugs, or cases of overdose
- While patients under anesthesia may be conscious or often unconscious, depending on the category of anesthesia being employed
- Many analgesics are patient controlled
- While anesthetics are controlled by qualified providers, not patients

Features of Anesthesia

- Suppression of autonomic and skeletal responses to stimuli
- Suppression of voluntary motor response
- Analgesia
- Amnesia



Held Stafford, DVM. "Minimizing the Risks of Anesthesia in Dogs." Preventive Vet, 14 June 2014. <https://www.preventivetvet.com/dogs/minimizing-the-risks-of-anesthesia-in-cats-and-dogs>.

Types of Anesthesia

- General anesthesia:
 - “What most people think of”
 - Patients are unconscious and lack awareness and sensation
 - Many different options of drugs
 - May be given as a gas or IV
 - Side effects may be numerous and adverse events may occur
 - Care must be taken in administration, monitoring, and paying attention to allergies and contraindications
 - (That goes for all types of anesthesia aside from general)



"Anesthesia: Types, Procedure, Side Effects and Risks." Netmeds, <https://www.netmeds.com/health-library/post/anaesthesia-types-procedure-side-effects-and-risks>.

Types of Anesthesia

- IV monitored sedation:
 - “twilight”
- Administered through IV
 - To induce drowsiness and relaxation
 - Deeper levels of sedation may be achieved
 - Depending on procedure type or patient preference
- Sound familiar?
 - Milder sedation allows the patient to respond to questions or instructions
 - Moderate sedation may cause the patient to doze off, but awake if prompted
 - Deeper sedation, close to general anesthesia, but patient can self respire



"Intravenous Sedation." NY/NJ Anesthesia, LLC. <http://www.ny/njanesthesia.com/intravenous-sedation>.

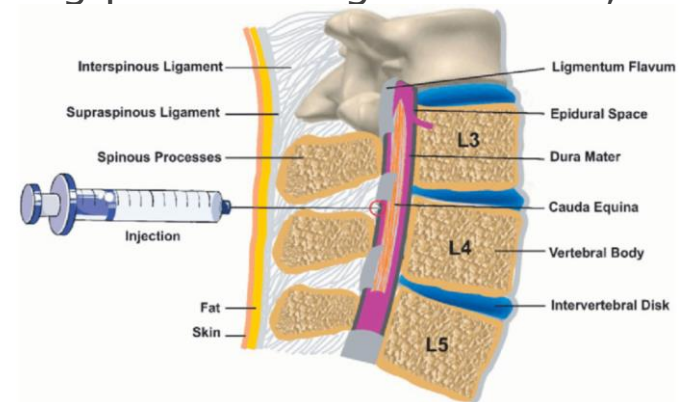
Types of Anesthesia

- Regional anesthesia:

- A “local” anesthetic is applied to a specific area of the body, preventing all sensation and response
 - Like limbs, portions of limbs, etc.
 - Acts on a large nerve bundle, ganglion, branching point exiting a foramen, etc.

- Spinal and epidural anesthesia are examples

- Used in child birth or total knee replacement
- Sometimes epidural catheters are left in place after surgery
 - To provide continuous anesthesia for a determined period of time



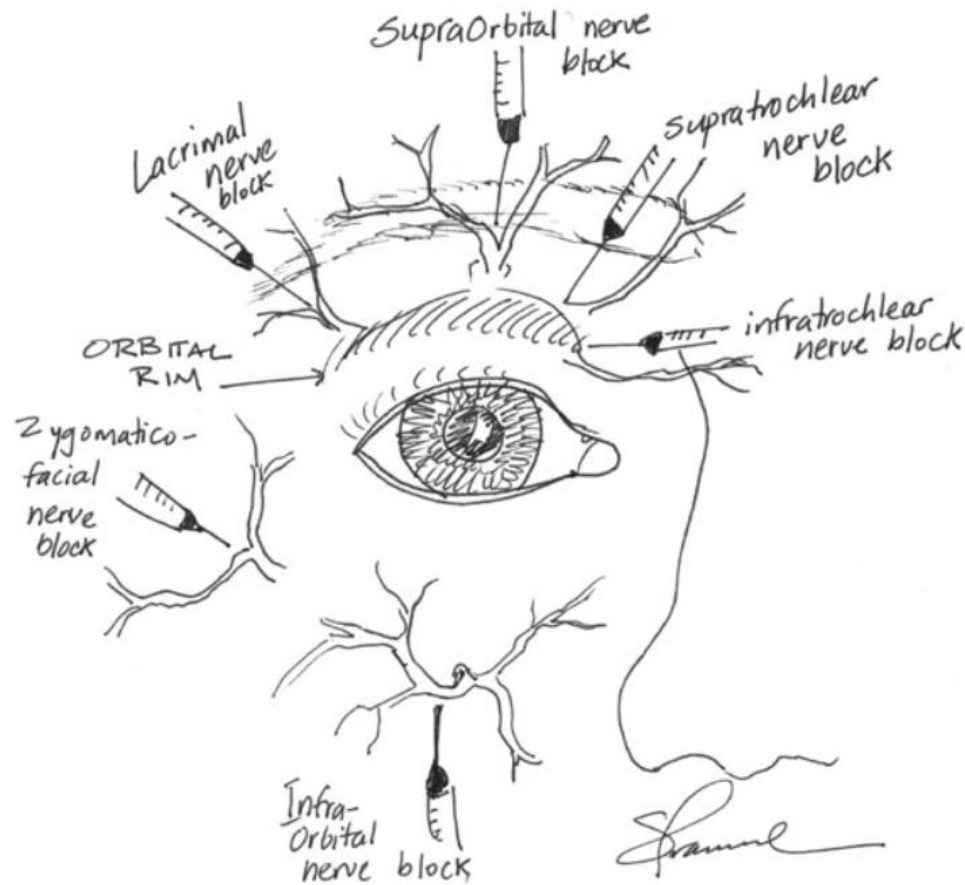
"Category:Epidural Anaesthesia." Wikimedia Commons, https://commons.wikimedia.org/wiki/Category:Epidural_anaesthesia.

Types of Anesthesia

- Regional anesthesia:
 - Nerve blocks are a type of regional anesthesia working on a smaller area
 - Local anesthetic is applied to a large nerve exiting a foramen at a branching point
 - Such as supra or infraorbital nerve blocks
 - Can consider this option as an optometrist if you want to prevent tissue distortion from a bolus, working on a larger area with multiple lesions, or involving much of the lid
 - May not be necessary in majority of instances
- Regional anesthesia may sometimes be used in combination with other types of anesthesia

Types of Anesthesia

- Regional anesthesia:
 - Nerve blocks



EyeFounds.org: Retrobulbar Block, Peribulbar Block and Common Nerve Blocks in Ophthalmology, <https://weboyo.ophth.uioowa.edu/eyeforum/tutorial/retrobulbar-nerve-blocks.htm>.

Types of Anesthesia

- Local anesthesia:

- Indications

- *Pain prevention or relief in
 - *Procedures (incisions)
 - *Trauma (lacerations)



- Motor block

- Diagnostic nerve block
 - To allow more accurate exam in setting of trauma or other disease



"CME Activity: Eyelid Laceration: Osteopathic Medicine." CME Activity | Eyelid Laceration | Osteopathic Medicine, <https://www.stalpearls.com/physician/cme/activity/27007/tdag-DO>.

Types of Anesthesia

- Local anesthesia:
 - Anesthetics, such as lidocaine, injected locally to a focal area or applied topically
 - Often provides enough relief for many, if not most, out patient procedures
 - Especially optometric procedures
 - Utilized for making small incisions, lesions shaves, excisions, suturing, filling cavities, etc.

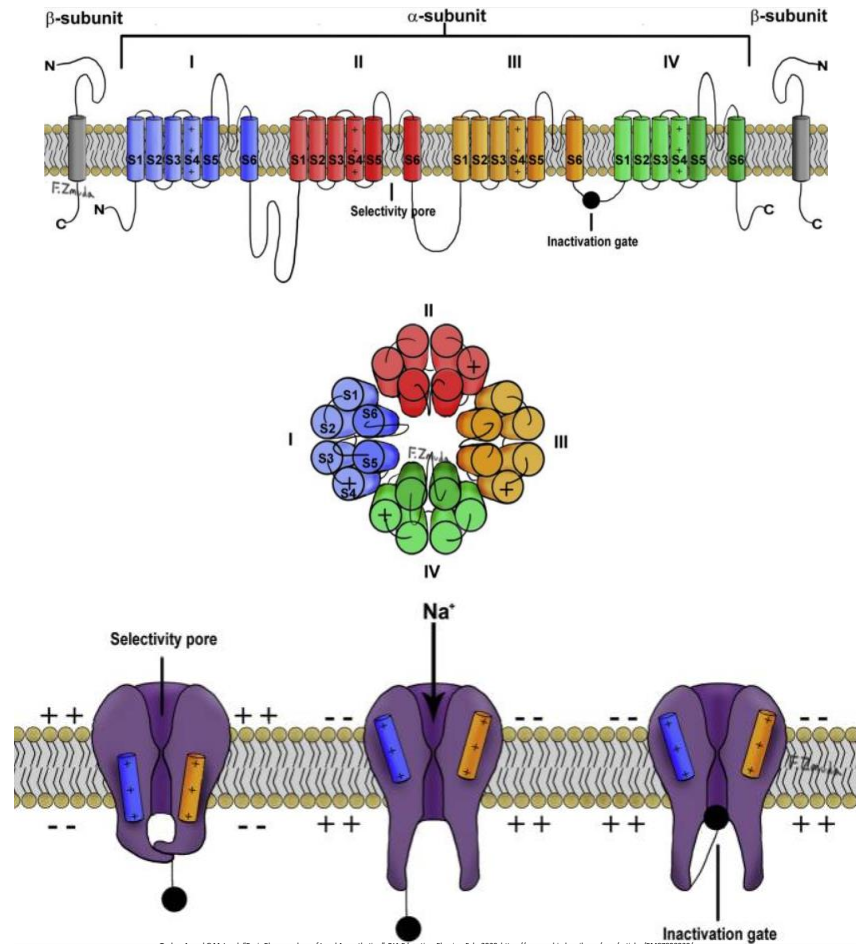
- Around the eyes for dermatologic procedures:
 - Injected intradermally
 - A small bolus or “wheel” is created under the lesion
 - Typically safe and well tolerated
 - But care must be taken with allergies, other contraindications, signs of anaphylaxis and other complications

Types of Anesthesia

- Local anesthesia vs topical anesthesia (gels, creams, refrigerants, etc.)
 - Local has good reliability and safety profile
 - Although may at times require larger amounts or multiple injections to cover an area
 - Process of injection may be painful and cause psychological discomfort
 - Wheel bolus may distort tissue
 - Topical has less reliability and safety profile
 - Often needs to be compounded
 - Should never be applied to an open wound
 - Does not distort tissue like an intradermal injection may
 - Refrigerants like ethyl chloride may be flammable

Local Anesthesia

- Mechanism of action of local anesthetics in the briefest sense is as follows:
- Action potentials in excitable tissues are suppressed by blocking voltage-gated Na^+ channels
- By this process they inhibit action potentials in nociceptive fibers and so block the transmission of pain impulses



Taylor, A, and G McLeod. "Basic Pharmacology of Local Anesthetics." BJA Education, Elsevier, Feb. 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7088630/>

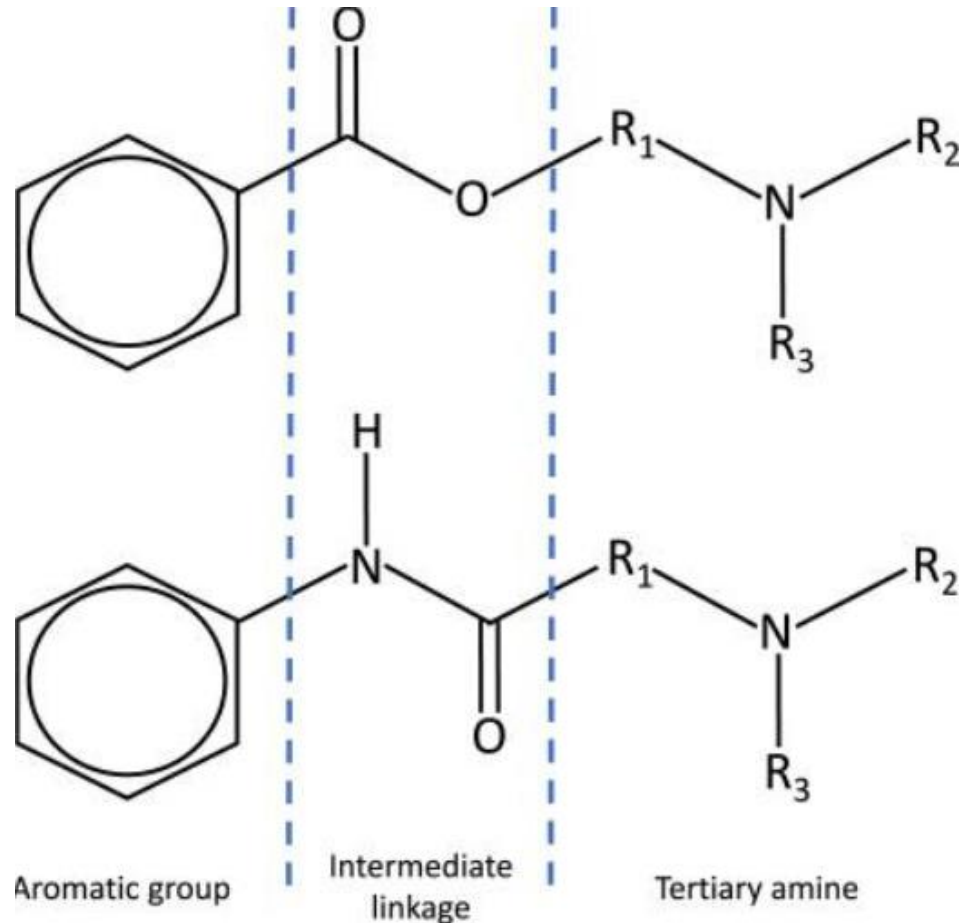
Amides vs. Esters

- Local anesthetic drugs are water-soluble salts of lipid-soluble alkaloids

- Structure of local anesthetics consists of three components:

- Lipophilic aromatic group, an intermediary link and a hydrophilic amine group

- The intermediary link categorizes local anesthetics into esters or amides



Taylor, A. and G. McLeod. "Basic Pharmacology of Local Anesthetics." MA Education, Elsevier, Feb. 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7808930/>

Amides vs. Esters

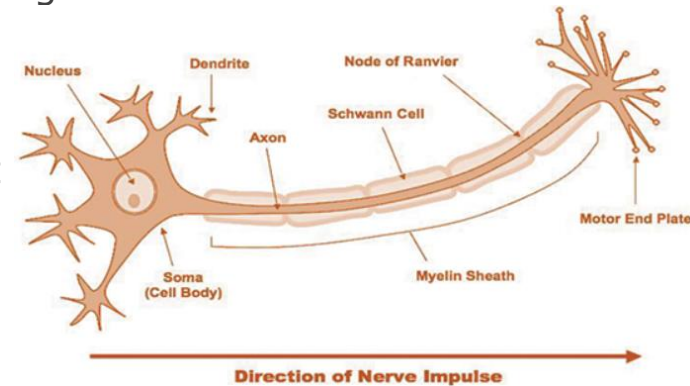
- Esters typically have fast onset and shorter duration
 - Metabolized locally, quicker than amides, into para-aminobenzoic acid, can cause allergy
- Amides typically have fast to slower onset and a longer duration
 - Metabolized in the liver, typically causes less allergic reaction

	Structural classification	MW	pKa	Protein binding (%)	Partition coefficient	Onset	Elimination half-life (min)
Cocaine	Ester	311	8.6	95	-	Fast	100
Chloroprocaine	Ester	271	9.1	-	17	Fast	6
Prilocaine	Ester	220	7.7	55	50	Fast	100
Lidocaine	Amide	234	7.8	70	110	Fast	100
Mepivacaine	Amide	246	7.7	77	42	Fast	115
Bupivacaine	Amide	288	8.1	95	560	Moderate	210
Ropivacaine	Amide	274	8.1	94	230	Moderate	120
Levobupivacaine	Amide	288	8.1	95	-	Moderate	210

Taylor, A. and G.McLeod. "Basic Pharmacology of Local Anesthetics." BMJ Education. Elsevier, Feb. 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7098030/>

Efficacy

- We need the local anesthetic to penetrate the cell membrane to get into the axon
- Anesthetics we use are typically weak bases
 - But are formulated in fairly acidic solutions
 - Contributes to a painful stinging sensation for the patient



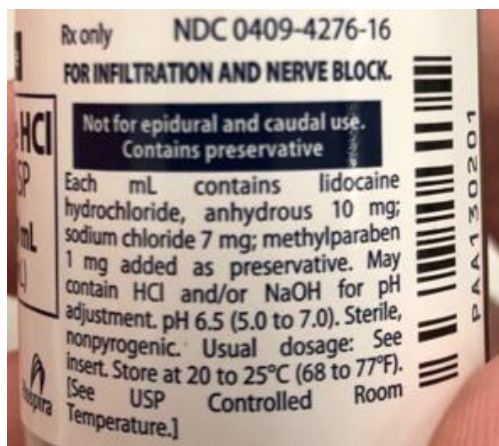
*Axons: The Cable Transmission of Neurons. Queensland Brain Institute, 17 Mar 2021, <https://qbi.uq.edu.au/brain-anatomy/axons-cable-transmission-neurons>.

- When using lidocaine for example,
 - There is ionized lidocaine and unionized lidocaine in the solution
 - Much more ionized form
 - But the unionized form is what actually penetrates into the axon
- This leads us to consider increasing the pH of the solution through adding a buffer
 - Gets us more unionized lidocaine available
 - Gets us more penetration and less sting from acidity

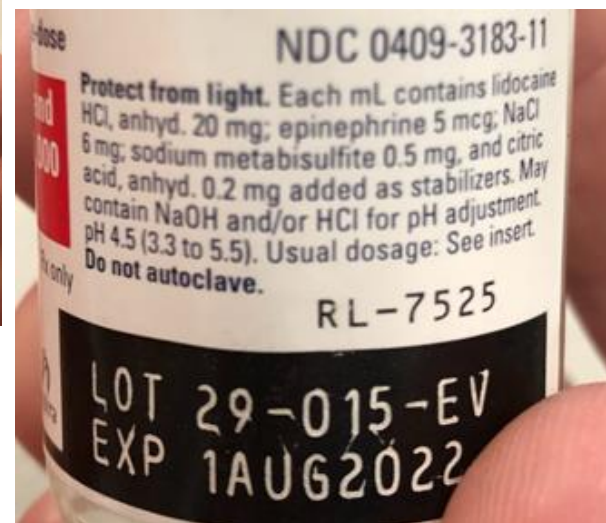


The Relevant Drugs

- The 2 anesthetics that are typically all you may need:
 - Lidocaine (0.5%, 1% or 2%)
 - Pretty much only one you need for what we do*
 - May or may not have epinephrine included



- Epinephrine (1:200,000 and 1:100,000)
 - Added in with anesthetic to promote
 - Vasoconstriction
 - Reduce bleeding
 - Slow anesthetic absorption into systemic circulation



- Bupivacaine (0.25%)
 - Acceptable to use, but has much longer duration and is generally unnecessary
 - May or may not have epinephrine included
 - Use is typical to mix 50/50 with lidocaine to achieve faster acting with longer duration

The Relevant Drugs

Type	Name	Percent Concentration	Onset	Duration (minutes)	Max Single Dose	Dosing in mg/Kg
Amide	Lidocaine (Xylocaine)	0.5%, 1%, 2%	Fast ~30 seconds	30-120 60-400 w/epi	300mg 500mg w/epi	4.5 mg/Kg (Not exceeding max single dose)
Amide	Bupivacaine (Marcaine)	0.25%	Slow ~5 minutes	120-240 240-480 w/epi	175mg 225mg w/epi	2.5 mg/Kg (Not exceeding max single dose)

How Much Lidocaine?

- **60Kg** patient (132.277 lbs)
- Max dose for this patient using lidocaine without epinephrine (**not exceeding 300mg**) using **4.5mg/Kg**
 - $4.5 \frac{mg}{Kg} \times 60 Kg = 270mg$ maximum allowable for this patient
- How does this translate into how many mL we can use?
 - Depends on the concentration of lidocaine you use
 - Using your selected concentration, move the decimal 1 place to the right to get **mg/mL**
 - **0.5%** concentration = **5mg/mL** of your lidocaine solution
- So again, how many mL can we use?
 - $\frac{270mg}{5mg/mL} = 54mL$ maximum allowable

How Much Lidocaine?

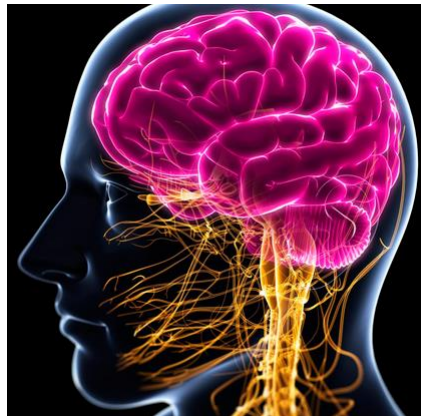
- To use 54mL of lidocaine on a patient for what we do would be **RIDICULOUS**
- We typically use 1mL tuberculin syringes to inject local areas for chalazions, papillomas, cysts, etc
 - May only use 0.3-0.6mL or so per intradermal injection per lesion to achieve an adequate wheel
- **In order to reach the maximum allowable dose for our example patient**
 - **You would need to inject 54 separate 1ml tuberculin syringes into the patient!!!**
- Patients often have multiple lesions, but it would be wildly unlikely for you to need this much medication for a patient

Contraindications to Local Lidocaine (other than allergy)

- Hx of central nervous system reactions with local anesthetic
 - Tremor/seizure
 - Visual disturbances
 - Tinnitus
 - Numbness around the mouth
- Hx of cardiovascular/pulmonary reaction with local anesthetic
 - Bradycardia
 - Hypotension
 - Arrhythmia
 - Hypoventilation
- Severe liver disease (amides)
- Pseudocholinesterase deficiency (esters)
- Medication:
 - Dihydroergotamine
 - Dronedarone
 - Saquinovir
 - Vernakalant(Miniscule intradermal amounts likely negligible, but preferable to avoid use)

Side Effects to Local Lidocaine and Signs of Adverse Events (other than allergy)

- If any, some redness or itch at the site of injection
- Can cause local vasodilation
- Small amounts of periorcular intradermal lidocaine unlikely to find its way into the brain or cardiac tissue to cause an adverse event, but for some reason if it would, pay attention for:
 - Tremor/seizure
 - Visual disturbances
 - Tinnitus
 - Numbness around the mouth
 - Bradycardia
 - Hypotension
 - Arrhythmia
 - Hypoventilation



"5 Ways Quitting Drinking Affects Your Brain." Renewal Lodge | <http://www.renewalodge.com/5-ways-quitting-drinking-affects-your-brain/>



PhD, Patricia Silva. "Abdominal Muscles Involved in Cardiopulmonary Pathology in ...". Muscular Dystrophy News, 13 Mar. 2015. <https://muscular dystrophynews.com/2015/03/13/abdominal-muscles-involved-in-cardiopulmonary-pathology-in-subjects-with-muscular-dystrophy/>

Contraindications to Local Epinephrine (other than allergy)

- Contaminated wounds***
- Cardiovascular event in past 6 months and unstable
- Insulin use (can counter-act)
- Cerebrovascular event in past 6 months and unstable
- Tricyclic antidepressants and MAO inhibitors
- Unstable angina
- Beta blocker use
- Refractory arrhythmia
- Uncontrolled thyroid
- Uncontrolled congestive heart failure
- Oxytocic use
- Coronary insufficiency
- Severe peripheral vascular disease (including diabetes)
- Stimulant abuse
- Uncontrolled HTN or malignant HTN levels
- Labor and delivery

Side Effects to Local Epinephrine and Signs of Adverse Events (other than allergy)

- If any, some irritation at the injection site
- Pallor around injection site due to vasoconstriction

- Small amounts of periorcular intradermal epinephrine unlikely to cause an adverse event, but nonetheless pay attention for:
 - Anxiousness
 - Tremors
 - Weakness
 - Dizziness
 - Sweating
 - Palpitations
 - Nausea or vomiting
 - Headache
 - Difficulty breathing



"5 Ways Quitting Drinking Affects Your Brain." Renewal Lodge | <https://www.renewalodge.com/5-ways-quitting-drinking-affects-your-brain/>.

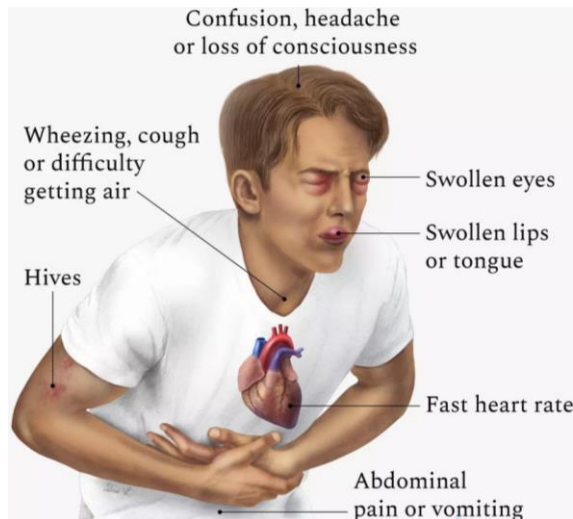


PhD, Patricia Silva. "Abdominal Muscles Involved in Cardiopulmonary Pathology in..." Muscular Dystrophy News, 13 Mar. 2015. <https://muscular dystrophynews.com/2015/03/13/abdominal-muscles-involved-in-cardiopulmonary-pathology-in-subjects-with-muscular-dystrophy/>.

Anaphylaxis

- Severe, potentially life-threatening allergic reaction
 - Can occur within seconds or minutes
- Causes the immune mediated shock
 - Blood pressure drops suddenly and the airways narrow, blocking breathing

- Signs
 - Urticaria
 - Hypotension
 - Bronchospasm
 - Weak and rapid pulse
 - Nausea, vomiting, or diarrhea
 - Syncope



Chandra Manupellai, MD. "Allergic Reaction and Anaphylaxis." Symptoms & Treatment, Buoy Health, Inc., 30 Mar. 2022, <https://www.buoyhealth.com/learn/allergic-reaction-anaphylaxis>.

- If occurs:
 - Call 9-1-1
 - EpiPen
 - Benadryl for more local allergic reactions

CNS Toxicity/ Cardiopulmonary Events and Other Rarities

- If occurs, as discussed on previous slides:
 - Call 9-1-1
 - Oxygen mask for CNS toxicity if available
 - BLS until paramedics arrive



Vectoryart. "Download Medical Ambulance in a Flat Cartoon Style on a Light Blue Background Vector Image, Icon for Free." Vectoryart, Vectoryart, 20 Apr. 2021. <https://www.vectoryart.com/vector-art/2299542-medical-ambulance-in-a-flat-cartoon-style-on-a-light-blue-background-vector-image-icon>.

- Methemoglobinemia
 - Extremely rare association with local anesthetic
 - (Incredibly unlikely or even possible with such small amounts)
 - Oxidizes hemoglobin
 - Prevents oxygen carrying
 - Causes refractory cyanosis
 - Treated with methylene blue



Forlas, Ioh. "Methemoglobinemia." EMCRIT Project, 30 Nov. 2021. <https://emcrit.org/ibcc/methemoglobinemia/>

Allergic Patients

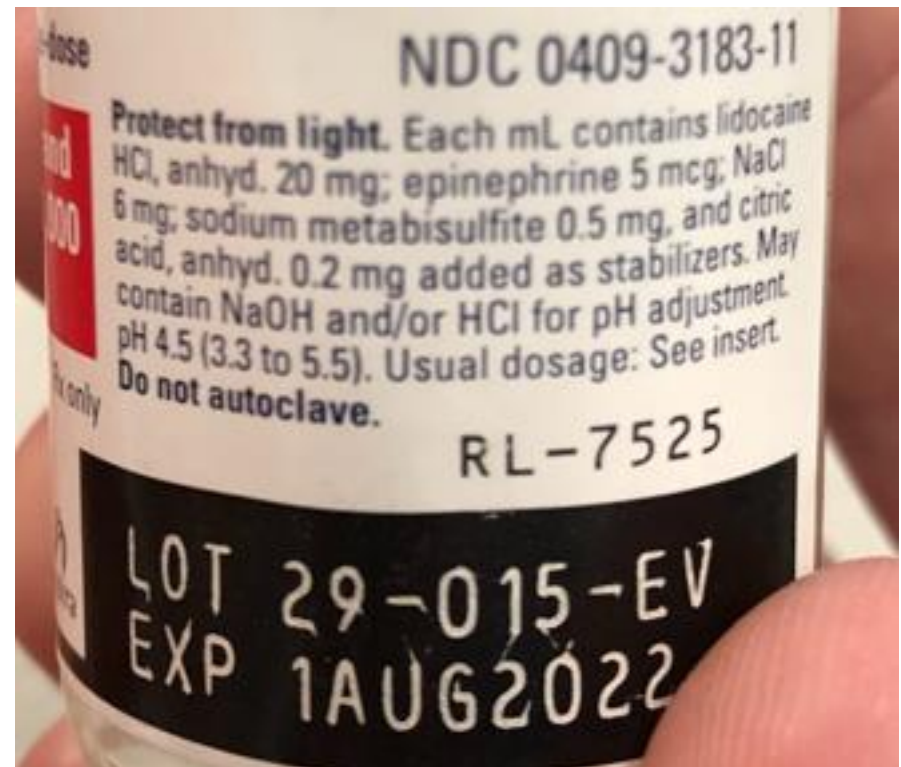
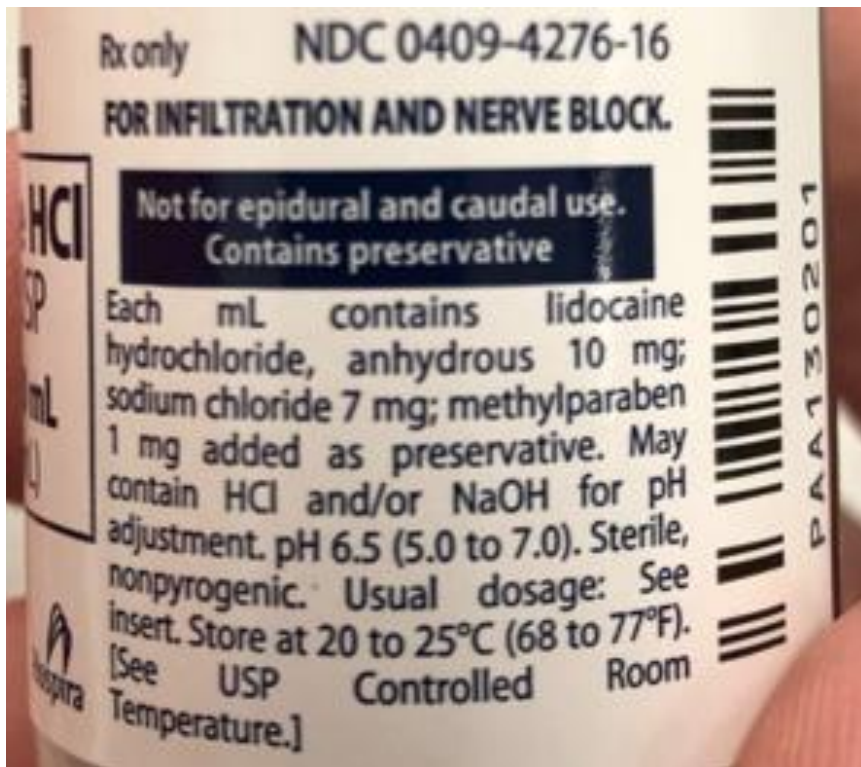
- *Most problems with local anesthetic is mostly due to the epinephrine, in general
- Regarding allergy, an actual epinephrine allergy is overwhelmingly improbable
 - *Any allergic reaction is likely due to bi-sulfite preservative in epinephrine formulation
- *If any contraindication to epinephrine...just use lidocaine without epinephrine*

- Local anesthetic allergies are also very uncommon
 - *Esters and amide classes have minimal cross reactivity
 - Esters more prone to allergic reaction

- Most allergic reactions to local anesthetic is due to methylparaben preservative
 - *Can obtain preservative single dose vials of lidocaine for these people

- What if they are allergic to amides and you don't have (or want to try) an ester???

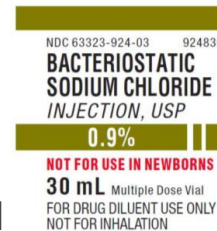
Allergic Patients



Allergic Patients

- What if they are allergic to amides and you don't have (or want to try) an ester???
- If procedure is very simple like a single stalked smaller papilloma...consider no anesthetic?
- Liquid diphenhydramine has been documented to have some anesthetic properties

- Bacteriostatic 0.9% saline preserved with benzyl alcohol
 - Very short duration, but works to similar level as lidocaine



Bacteriostatic Sodium Chloride Injection, USP. U.S. National Library of Medicine, National Institutes of Health.
<https://dailymed.nlm.nih.gov/dailymed/lookupDrug.cfm?setid=65225d1-0058-40c9-9645-3ae402f992&type=display>



Sterile, Nonpyrogenic
Each mL contains:
Sodium chloride 9 mg;
benzyl alcohol 0.9%;
Water for Injection q.s.
HCl and/or NaOH may
have been added for
pH adjustment.

Usual Dosage:
See package insert.
Store at 20° to 25°C
(68° to 77°F) [see
USP Controlled Room
Temperature].

25 Vials

 **FRESENIUS
KABI**
Lake Zurich, IL 60047
www.fresenius-kabi.com/us

Allergic Patients

REVIEW ARTICLE



Bacteriostatic preserved saline for pain-free periocular injections: review

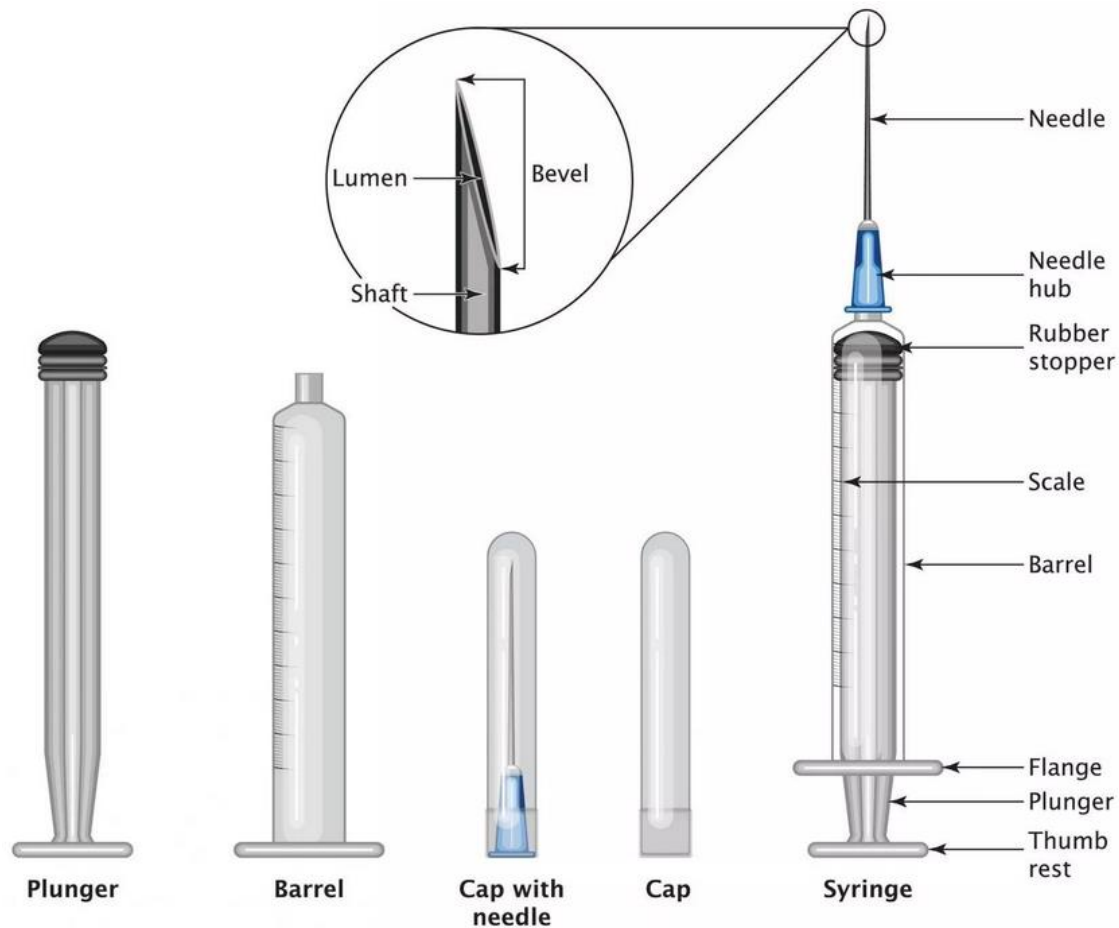
Samantha Vicki Hunt¹ and Raman Malhotra¹

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We review evidence regarding the use of 0.9% benzyl alcohol in 0.9% sodium chloride solution for periocular injections ('preserved saline') including botulinum toxin A injections and local anaesthesia. A literature search was undertaken using search terms 'bacteriostatic saline', 'benzyl-alcohol saline', 'benzyl alcohol sodium chloride' and 'preserved saline'. Bibliographies identified further sources. There have been 62 studies published on the subject of preserved-saline since 1928. Significantly lower injection-associated pain levels for periocular/facial botulinum toxin injections reconstituted with preserved-saline rather than preservative-free saline are reported by 5 studies. Significantly lower injection-associated pain with preserved-saline diluted lidocaine and epinephrine solution for eyelid anaesthesia compared with unmodified or buffered lidocaine with epinephrine, and adequate anaesthesia, was reported by one study. Thirty-one studies have explored preserved-saline for anaesthetic and seven for bacteriostatic properties, with very low infection rates after periocular botulinum toxin injections, and reduced rates of infection in indwelling catheters when preserved saline is used to flush. A meta-analysis concluded that lidocaine-containing solutions are more effective at reducing pain from insertion of intravenous catheters. Patient-perceived pain related to periorbital injections of local anaesthesia is reduced when the anaesthetic is diluted with benzyl alcohol-preserved saline compared with other dilution or buffering options. Pain is similarly reduced for periocular botulinum toxin injections reconstituted with preserved saline compared with unpreserved saline. Benzyl-alcohol preserved-saline is inexpensive but costlier than unpreserved-saline, with minimal reported complications, particularly with periocular administration, and offers the opportunity to improve the patient experience.

Eye; <https://doi.org/10.1038/s41433-021-01925-z>

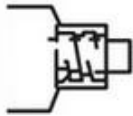
Other Supplies



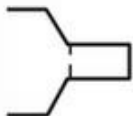
Anna. "What is a 3-Part Syringe?" KMED Leading Infusion Set Manufacturer, Disposable Medicals Supplier. Kmed Kmed. 12 July 2021. <https://www.kmedhealth.com/what-is-a-3-part-syringe/>

Other Supplies

Types of Syringe Tips



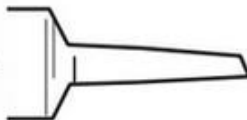
Luer Lok Tip - secure screw type connection.



Slip Tip - slip or push-on connection.



Eccentric Tip - off center tip used for surface veins or artery injections.



Catheter Tip - Longer and tapered slip tip design used for irrigation or with tubing.

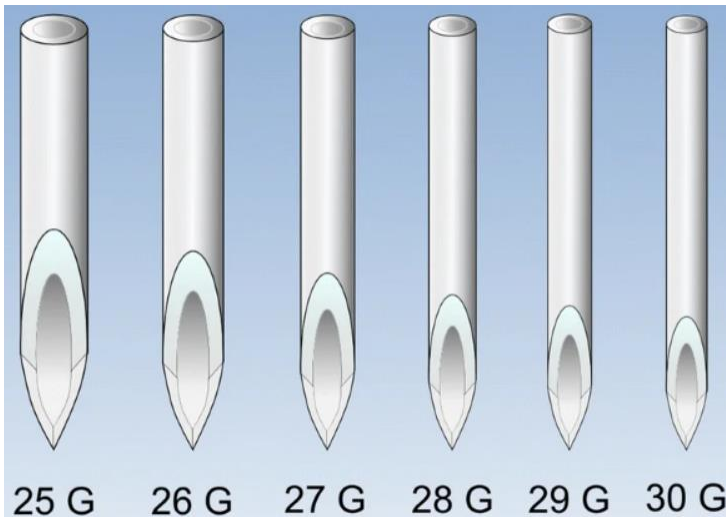


Anna. "What is a 3-Part Syringe?" KIMED Leading Infusion Set Manufacturer/Disposable Medicals Supplier." Kimed, Kimed, 12 July 2021. <http://www.kimedhealth.com/what-is-a-3-part-syringe/>.

Other Supplies



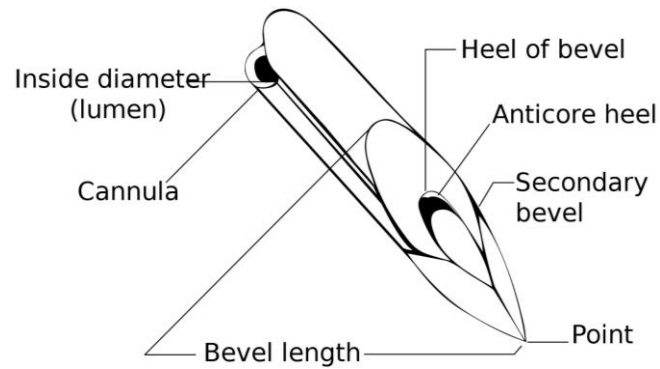
ISO Hub Color Standards for safety-engineered needles



Health, Medlog Bio. "Medical Needle Types, Sizes, Color Coding and Uses." Medlog Bio Health Blogger, 16 Feb. 2022. <https://www.medlogbiohealth.com/2021/03/types-of-medical-needles.html>

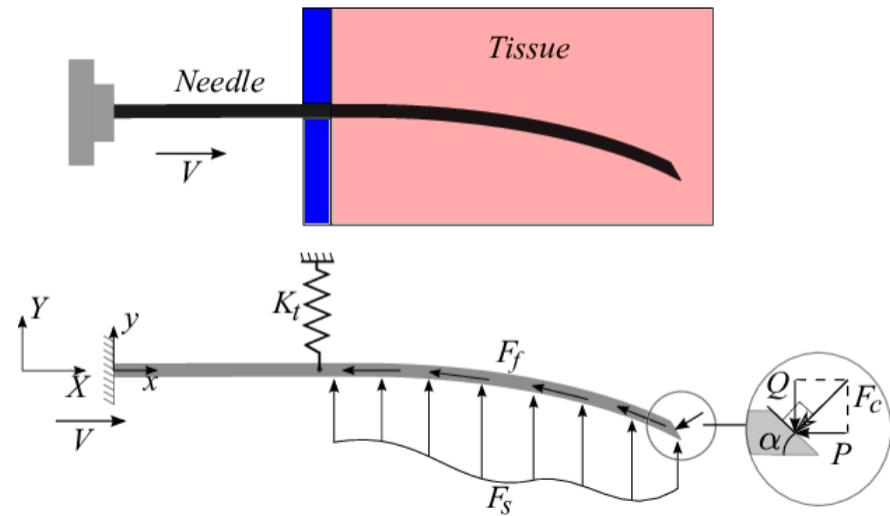
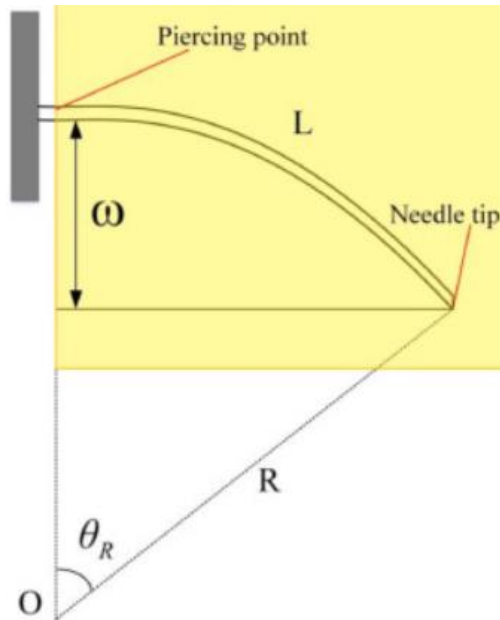
Other Supplies

"BD 305155 - Needle Reg Bevel 22gx1." CIA Medical - Central Infusion Alliance, <https://www.ciamedical.com/bd-305155-ciae-needle-reg-bevel-22gx1>.



Other Supplies

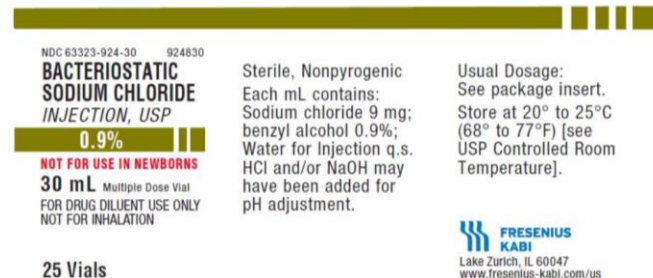
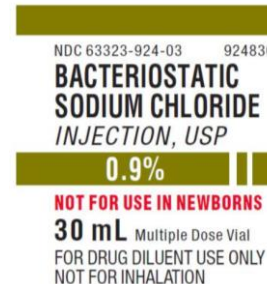
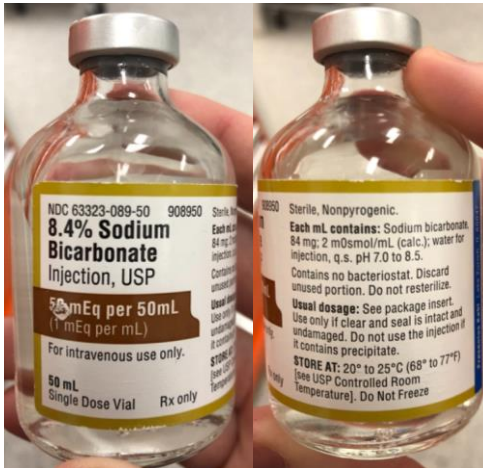
Chen, et al. "Optical Fiber Needle Path Planning Based on Particle Swarm Optimization." Computer Methods and Programs in Biomedicine, Elsevier, 1 May 2020, https://www.sciencedirect.com/journal/computer-methods-and-programs-in-biomedicine/issue/030483070302202.



- Typically use 1/2"- 1 1/2" for optometry procedures
- ~ 3/4" is probably most useful
- *Use shorter length when learning

Helpful Tips For Minimizing Patient Pain

- Make sure they are comfortable with you and talk to them calmly
- Raise the pH with 8.4% sodium bicarbonate buffer to create more unionized lidocaine
 - Will also reduce sting
 - Use 9 parts anesthetic to 1 part sodium bicarbonate
- Bacteriostatic 0.9% saline preserved with benzyl alcohol may also be an effective buffer
 - While having its own intrinsic anesthetic properties



*Bacteriostatic Sodium Chloride Injection, USP." U.S. National Library of Medicine. National Institutes of Health. <https://dailymed.nlm.nih.gov/dailymed/foia/foia.cfm?setid=4562551-058-40c9-9645-3ae402f95281npe-dsplay>.

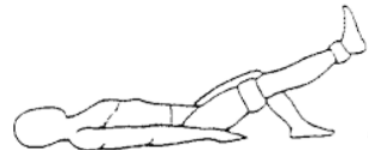
Helpful Tips For Minimizing Patient Pain

- Warm the medications with a baby bottle warmer



Amazon.com: Philips Avent Fast Baby Bottle Warmer with... <https://www.amazon.com/Philips-Temperature-Control-Automatic-Over-0019900170022>

- Have patient raise their leg



"Lumbar Activities Booklet" Lumbal Activities Booklet - Comprehensive Center, http://www.physio.com/Content_Articles/Comprehensive_Center.html

- Pinch the patient's skin to reduce ability to discriminate the location of the pain



"The Elasticity of Your Skin with a Pinch Test" Healthy Skin & Beauty Treatment Center, 20 Oct. 2020, <https://healthy-skin.com/over-the-elasticity-of-your-skin-with-a-pinch-test/>

- Have patient keeps their eyes open



"Shocking Duggan: Crazy Eyes" IMDb.com, http://www.imdb.com/title/tt1040718/characters/nm1040718?ref_=chicago_character

Helpful Tips For Minimizing Patient Pain

- Use smaller gauge needles to inject
 - 27g or 30g*
- Inject medication slowly



- Insert needle quickly



- Can consider a topical anesthetic
 - Really not necessary

Performing



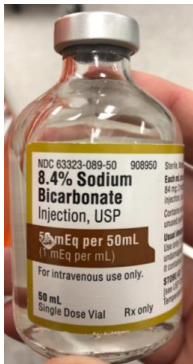
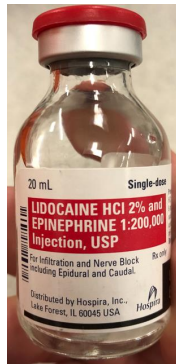
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30G x 1/2



Amazon.com: PHILIP AUSTIN First Aid Baby Bottle Wiper with... <https://www.amazon.com/PHILIP-Alexander-Temperature-Control-Antibiotic-Clout-0769082170102/>



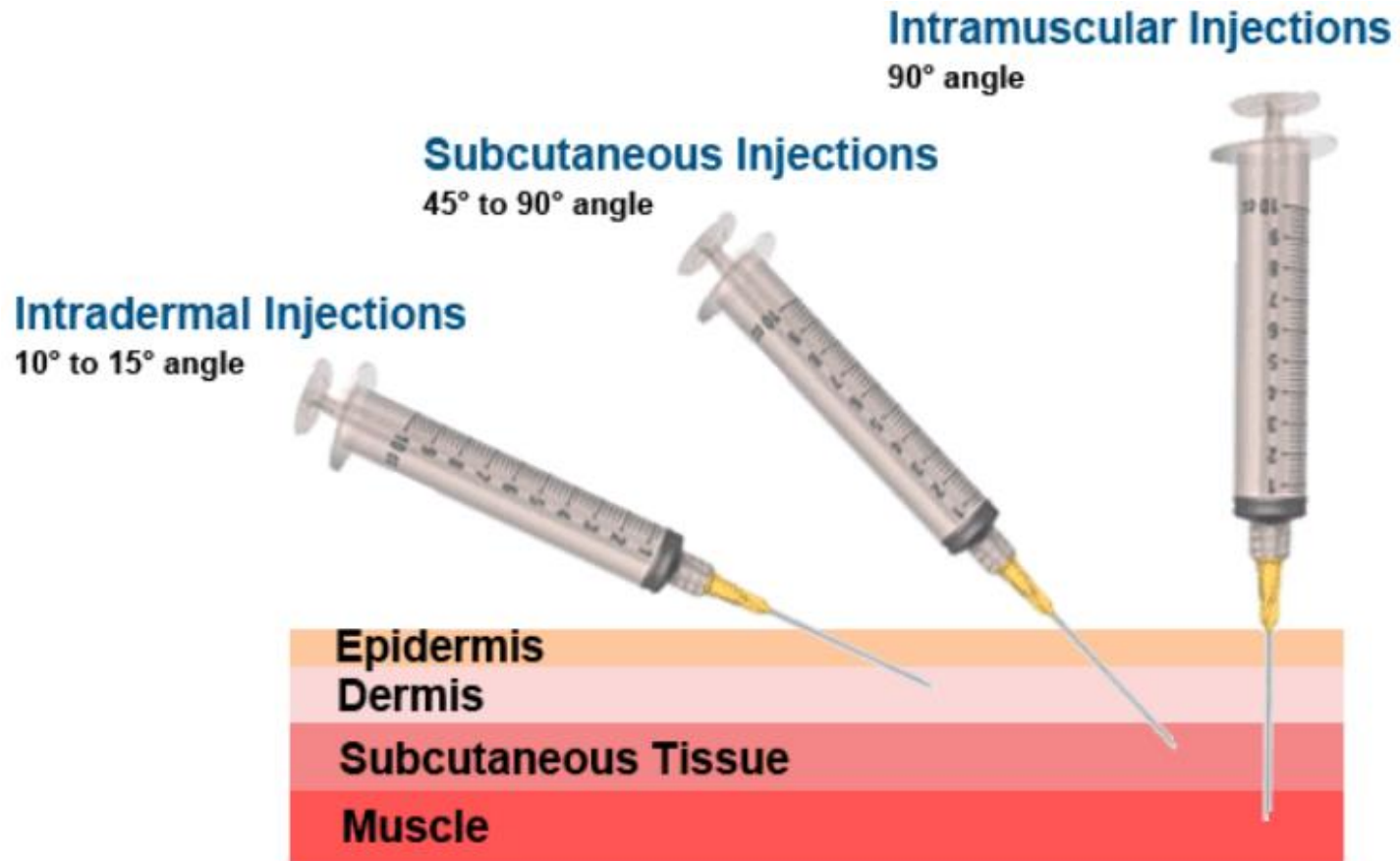
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Performing



Technical Tips

- Always be aware of your angle of approach
- Tighten skin in the direction parallel to your needle approach
- Always try to approach with the needle NOT facing the globe
- Insert 1-2mm in front of the lesion
- Don't need to aspirate, because eyelid vessels are too fine to have needle inside of a vessel
- Get under the lesion or just slightly past, and inject as you retract the needle
 - Always inject while retracting

Post-injection

- Tamponade any bleeding with sterile CTA/gauze pad
- Mechanical deturgescence
- Monitor patient for signs of adverse reaction
- Prep yourself for the remainder of the procedure

Cognitive Tips

- Always make sure you assess patients for level of risk
- Always pay attention for adverse reactions
- Always make sure you are drawing and injecting the right medications
- Always make sure your informed consent forms cover risk of anesthetic/epinephrine

Questions?

- Thank you

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