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consulting fees for Imprimis
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for the MKO melt medication



Outpatient • Office Based • Non-Operating Room



The Use of Needle and Supplemental Regional Blocks in Ophthalmology

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Objectives

- Be able to recognize that all types of ophthalmic surgeries are ideal for using regional blocks
- Be able to identify the pros/cons of each type of ophthalmic needle block
- Be able to acknowledge choose which supplemental block is beneficial in certain conditions
- Be able to approach sedation in the setting of a regional ophthalmic block
- Be able to properly document your block

When should I use regional? Always! (almost)

- Cataract: complex, iris hooks, myalugian ring
- Glaucoma: aqueous shunt insertion, trabeculectomy, mini-shunt
- Cornea: transplants (PKP, LKP, DSAEK, DMEK), superficial keratectomy, pterygium
- Vitreoretinal: vitrectomy, scleral buckle, removal of lens fragments
- Strabismus
- Enucleation, Evisceration

Block as the primary anesthetic

Pros

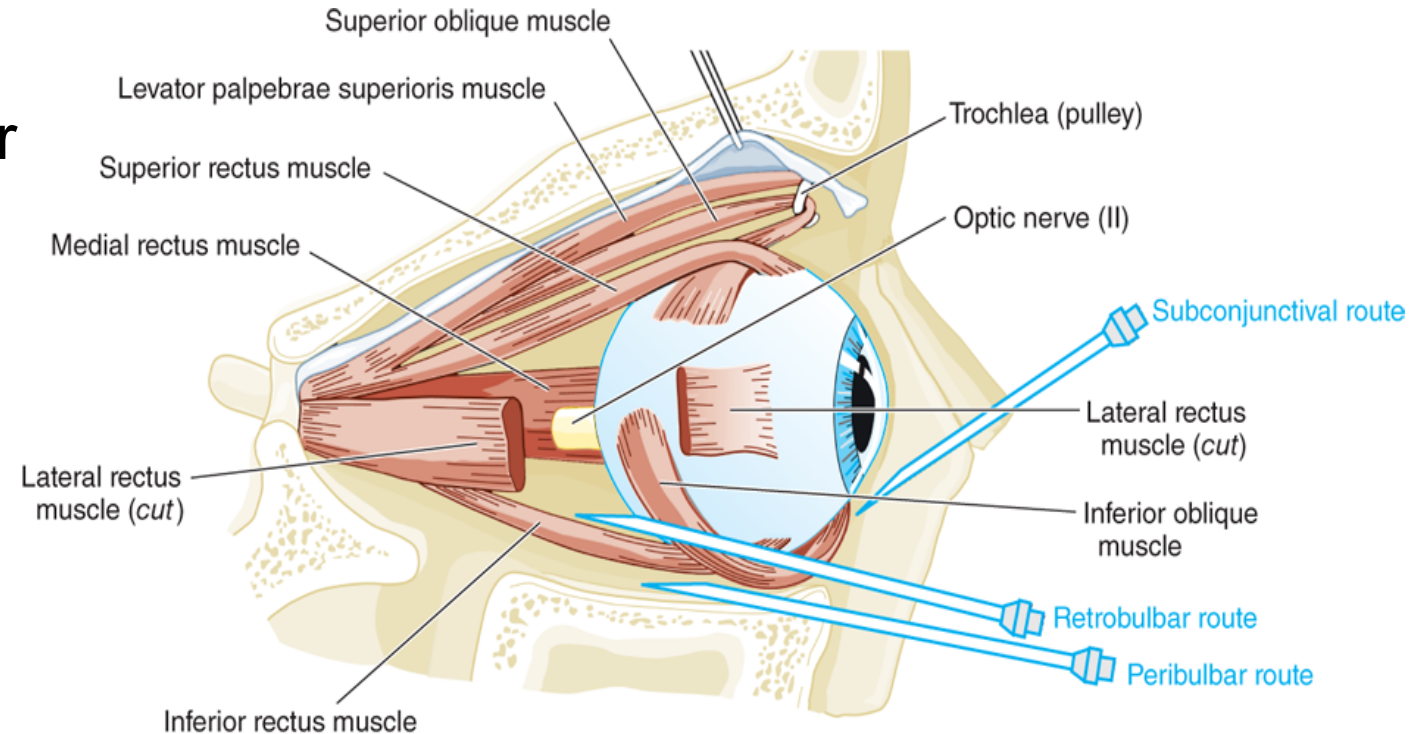
- Fast setup, can be done in preop
- Can avoid drugs used in GA and their complications (e.g. n/v)
- Superior post-op pain control
- No grabbing at the surgical eye during wake-up/recovery
- Can immediately be placed face down after retina surgery
- Faster discharge times

Cons

- Difficult in uncooperative patients
- Possible injection complications
- Need trained and willing anesthesia and nursing staff

Different Types of Ophthalmic Blocks

- Primary Blocks
 - INTRAconal aka RETRObulbar
 - EXTRAconal aka PERIbulbar
 - Medial Canthal/Caruncle
 - Sub-tenons
- Supplemental Blocks
 - Medial Canthal/Caruncle
 - Facial Nerve
 - Sub-tenons



Source: Laurence L. Brunton, Randa Hilal-Dandan, Björn C. Knollmann: Goodman & Gilman's: The Pharmacological Basis of Therapeutics, Thirteenth Edition: Copyright © McGraw-Hill Education. All rights reserved.

Retrobulbar Blocks

Pros

- Akinesia and anesthesia more predictable with one injection
- Faster onset
- Less volume

Cons

- Typically spares the orbicularis oculi muscle so the patient can still squint against speculum = discomfort
- May also spare the superior oblique
- Risk of optic nerve injury, brainstem anesthesia, retrobulbar hemorrhage, globe perforation
- More posterior pressure (can be treated with orbital compression)

Peribulbar Blocks

Pros

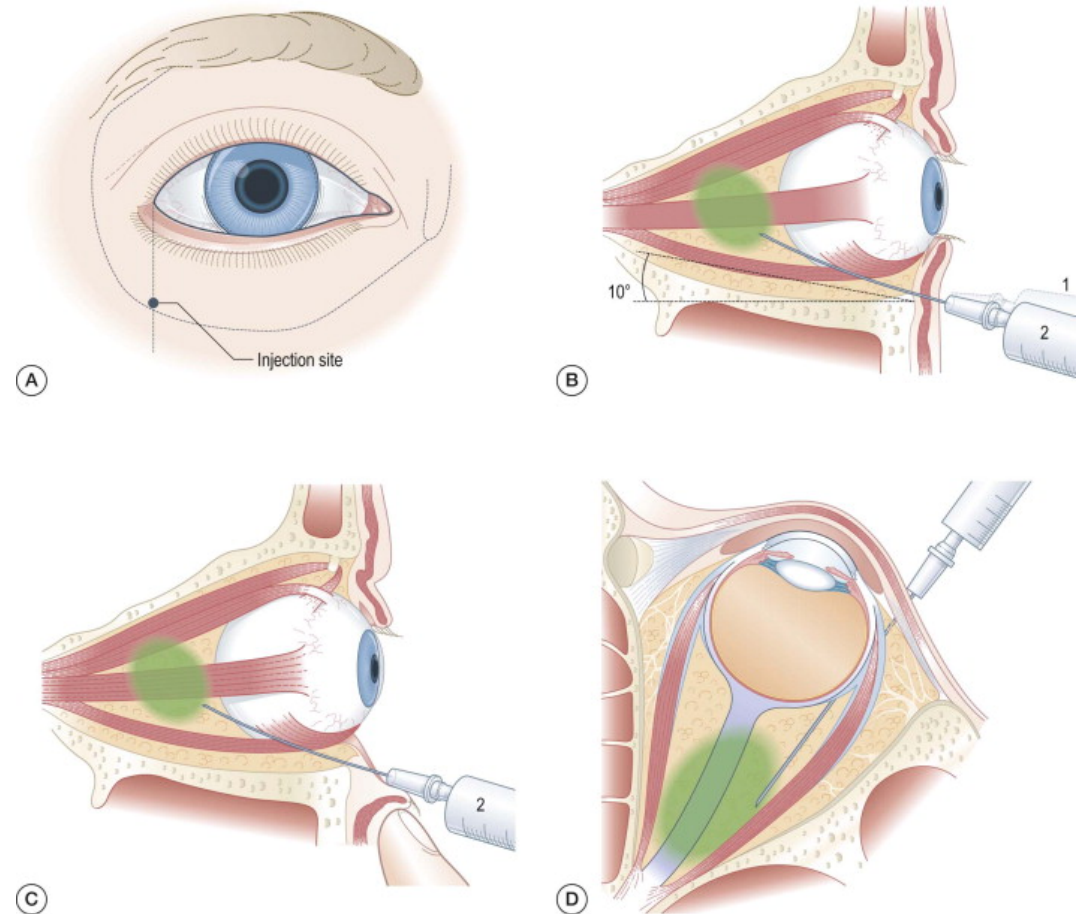
- Less risk of optic nerve injury, brainstem anesthesia, retrobulbar hemorrhage
- Can get complete anesthesia and akinesia when used with supplemental block
- Spread into adipose tissue = block of orbicularis oculi = no blinking or squeezing of eye
- Less pain on injection = easy to do “awake”
- Less posterior pressure

Cons

- Slower onset, higher volumes
- Often need supplemental block for full akinesia as spread can be uncertain or incomplete
- Myopic staphyloma which occur in highly myopic eyes (“long”, >26mm) could lead to globe perforation
- Conjunctival chemosis

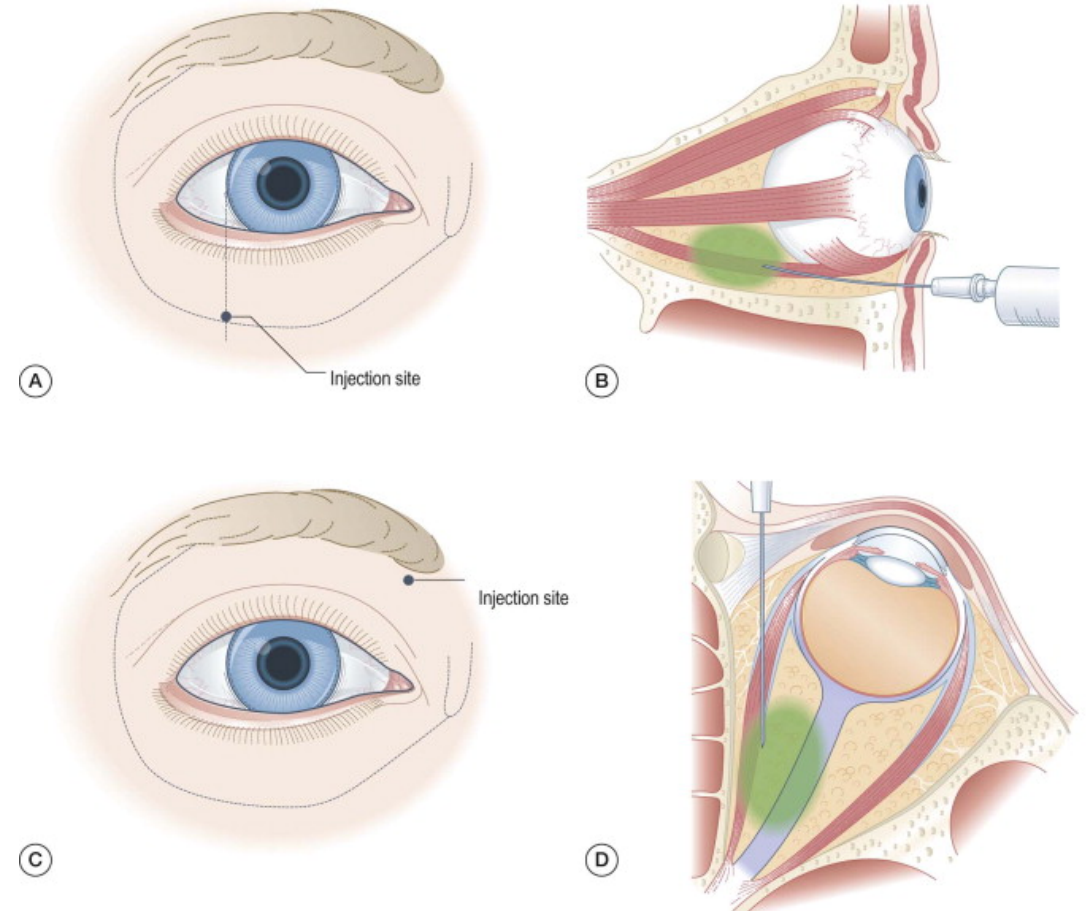
Retrobulbar

- 1.25 to 1.5 inch, 25- gauge, sharp or blunt (Atkinson)
- Smaller volume, 3-5 ml in the literature
- Either a transcutaneous or transconjunctival approach may be used (C)
- The midsagittal plane of the eye should not be crossed because the optic nerve lies on the nasal side of this plane (D)



Peribulbar

- 25 gauge 1" or 7/8" needle, sharp or blunt (Atkinson)
- Larger volume, 6-10ml
- Either a transcutaneous or transconjunctival approach may be used (C)



Medial Canthal Blocks

- Great supplement to an infero-temporal peribulbar block when complete akinesia is desired (e.g. corneal transplant, retina)
- Blocks the medial rectus - a muscle often missed with a standard peribulbar block
- Superior nasal block will also block the medial rectus and superior oblique but is a riskier block due to location in relation to orbit (risk for perforation) and vascular supply
- Avascular location and lacks vital anatomic structures
- This block could also be used as your primary injection site

Medial Canthal Block

- 27 gauge ½” needle - Inject approx 2ml, can often feel it spreading around globe with fingers
- Apply topical drops to area prior to injection - I prefer tetracaine
- Needle is inserted medial to the caruncle, aim towards nose at about 30 degree angle.
- Can get some bleeding at medial canthus, usually minimal and self limited
- Can induce sneezing so be prepared if patient has sharp inhale
- With the shorter needle no need to worry about needle depth

From: Ophthalmic Blocks at the Medial Canthus
Anesthes. 2001;86(8):1633-1636.

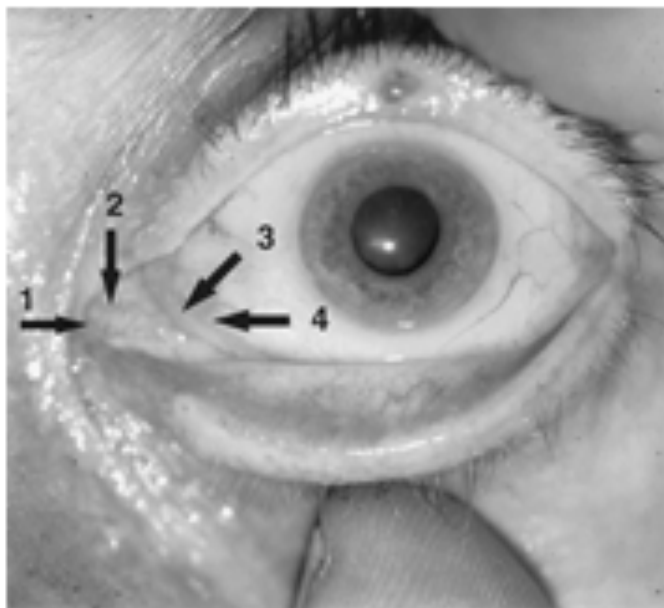


Figure Legend:

Fig. 1. Site of introducing the needle. 1 = Site of introducing the needle for the technique of Hustead; 2 = caruncle; 3 = semilunar fold of the conjunctiva; 4 = site of introducing the needle for our technique.

Facial Nerve Blocks - Anatomy

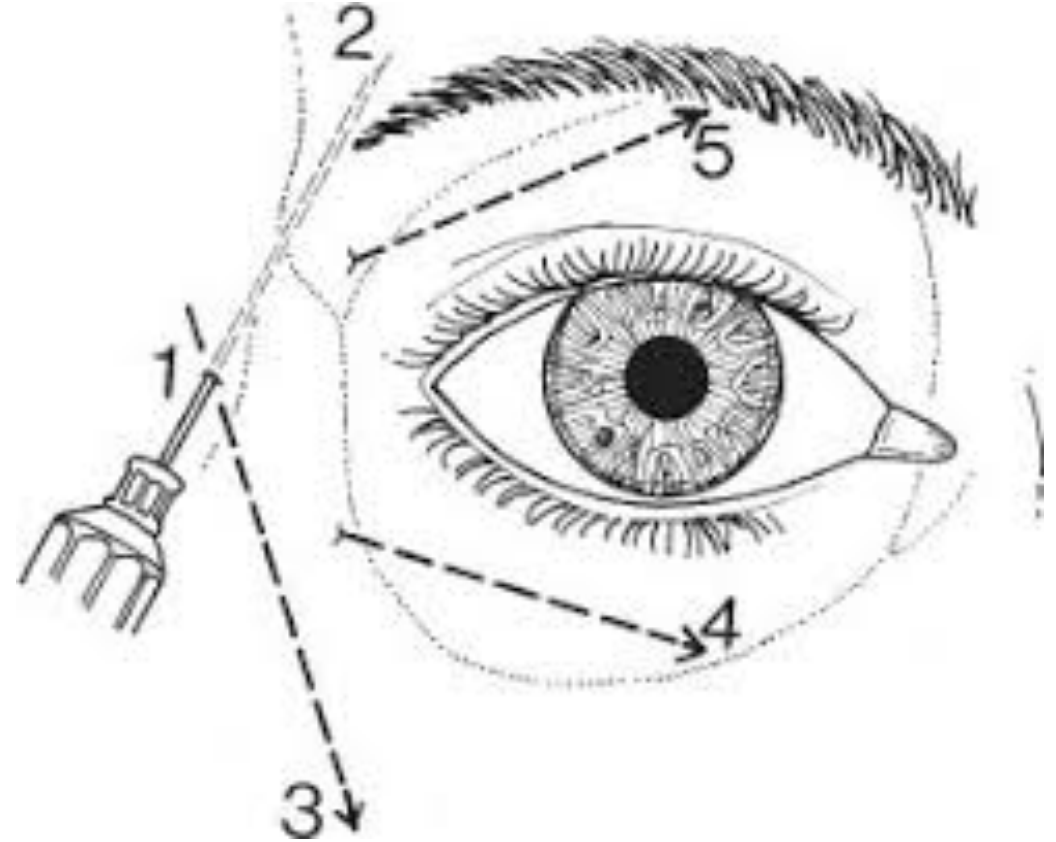
Blocking the orbicularis is important – it reduces the risk of forcing out the ocular contents if the patient tries to close his eyelids forcibly after the surgeon opens the globe – it also adds additional analgesia to the speculum

Facial nerve (CN VII)

- Temporal branch – typically blocked by peribulbar adipose spread
 - Frontalis
 - Orbicularis Oculi (upper lid)
 - Corrugator Supercillii
- Zygomatic branch – modified Van Lindt used to block
 - Orbicularis Oculi (lower lid)

Modified Van Lindt

- Introduce needle 1cm from lateral canthus
- Raise a wheel of anesthetic
- Insert needle inferiorly and superiorly, injecting 1-2ml while withdrawing – don't remove needle from skin
- Optional to supplement with additional injections across orbital rim (usually not needed if did peribulbar block)



Block Solutions to Choose From

- **2% lidocaine + 0.75% bupivacaine + hyaluronidase**
 - Most common
 - Fast onset and long duration, 6-8 hours block time
 - Can be ordered pre-mixed from compounding pharmacies
 - Hyaluronidase to facilitate spread and decrease myotoxicity
- **2% plain lidocaine**
 - Medium duration, approximately 1-2 hours
- **3% Chloroprocaine**
 - Short duration, approximately 45 minutes - 1 hour
 - Best for monocular patient who requires their “good” eye to be blocked. Observe patient for return of sensory and motor before d/c
 - In practice, provides more sensory block than motor unfortunately
- **Epinephrine can be added to prolong block duration**

Medications to use during the block

Table 1. Pharmacokinetic Comparison of Anesthetic Agents

	Methohexital	Propofol
Onset of action	Ultra-short-acting	Short-acting
IV induction dose	1-2 mg/kg	1.5-2.5 mg/kg
Elimination half-life	3.9 h	1.8 h
Minimal hypnotic level	10 mcg/mL	1.1 mcg/mL
Clearance	10.9 mL/kg/min	30 mL/kg/min
Metabolism	Phase 1	Phase 2

min: minute. Source: References 6, 7.

- None!
- Light sedation e.g. midazolam
- Go to sleep briefly (see chart)
 - dose-dependent blood pressure drop is seen because of vasodilation
 - Pain on injection, which can be mitigated with prior lidocaine administration
 - Prices vary but Methohexital about \$10/patient (50mg) and Propofol about \$5/patient (200mg)

Documentation of your block

- When reviewing litigation cases, one common thread is the lack of or poor documentation of the block
- One should document the following:
 - Brief discussion of risk (temporary or permanent loss of vision possible but unlikely)
 - Start/stop time, actual block time
 - Time out, confirmation of laterality, aseptic technique, O2/monitors used, aspiration -
 - Axial length (if available, risk of myopic staphyloma)
 - Needle(s) used, LA used/volume, technique(s) used
 - Anesthesia (if any), vital signs
 - Complications noted
- In my opinion, when reviewing cases, I would like to see documentation be on the side of “more” and not “less” so that I can easily re-create the series of events.

Eye Block

JEFFRIES, MAGGIE E 66yr
M
DOB: 07/19/55
DOS: 02/08/21
Ht: 172.7 cm Wt: 74.84 kg
MRN: 004333
Account #: 00000000
VisitType:

Discontinuous Start: 02/08/2021 12:35 Discontinuous Stop: 02/08/2021 12:38

- ☒ Placed before start time
☐ Placed after induction
☐ Block requested by surgeon for post-op pain control

☒ Risks specific to the block discussed with patient including blindness

Axial Length: ☒ <22 ☐ 22-26 ☐ >26 ☐ Not Available

☒ Timeout Performed ☒ Aseptic technique ☒ O2 & Monitors placed

☒ Aspiration Negative Laterality: [Right]

Needle: ☒ 25G 1" ☐ 27G 1/2" ☐ Atkinson 7/8 inches ☐ Other

Block: [Peribulbar] **Approach:** [Percutaneous]

Volume Injected: Peribulbar: 5 mL Medial canthal: mL Supraorbital: mL

Local Anesthetic Solution
☒ 1% lidocaine + 0.375% bupivacaine + 0.5mL hyaluronidase/mL
☐ 3% chloroprocaine + 0.5mL hyaluronidase/mL

☐ Brief IV general anesthetic ☒ Sedation ☐ No Meds

☒ refer to nursing note for vitals signs

Medications Given

☐ Lidocaine mg
☐ Brevital mg
☐ Propofol mg

Block Performed at: 02/08/2021 12:37

☐ Honan pressure reducer placed at less than 50 mmHG

Complications:

☐ Eyelid hematoma ☐ Other Complication ☒ No complications noted

Comment:

Electronically signed by Jeffries, Maggie on 02/08/2021 12:38

Summary

- All ophthalmic surgeries can be performed under block +/- sedation
 - Keep it simple with sedation: Valium PO, titrated in midazolam, MKO melt
 - Avoid narcotics when possible due to potential for n/v
 - Combinations of meds with caution as obstruction during surgery is problematic
 - Avoid medications that will make patient completely disoriented (e.g. propofol)
- With ageing, sicker patient population, ability to block is crucial
- Choice of block depends on type of surgery – experience matters!
 - Anesthesia +/- akinesia needed (e.g. cataract): peribulbar block
 - Anesthesia + akinesia needed (e.g. PKP, vitrectomy): peribulbar + medial canthal block
 - Anesthesia + akinesia + lid relaxation (e.g. scleral buckle, squinter): peribulbar + medial canthal + Van Lindt block

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