Amethocaine (Tetracaine) 2018

Newborn Use Only

Alert	Prolonged ophthalmic use is not recommended due to risk of severe keratitis and corneal adverse effects. Safety data is lacking and therefore use the lowest concentration available.
Indication	Local anaesthesia for eye examination (including RetCam) and procedures (laser) in newborn infants in conjunction with other pharmacological and/or non-pharmacological analgesic methods.
Action	Local anaesthetic.
Drug Type	Ester-type local anaesthetic.
Trade Name	Minims Amethocaine Eye Drops (Tetracaine (amethocaine) hydrochloride)
Presentation	Eye drops 0.5% (5 mg/mL), 1% (10 mg/mL) approximately 0.5 mL. Excipients include hydrochloric acid and purified water. No preservatives.
Dosage / Interval	One drop each eye as required 1–5 minutes prior to examination. Further drops may be needed to achieve a complete anaesthetic effect.
Maximum daily dose	No information.
Route	Topical instillation into the eyes from the container or use a microdrop (5–7 microL) cannula.
Preparation/Dilution	Eye drops (clear, colourless, sterile) 0.5% (5 mg/mL), 1% (10 mg/mL), approximately 0.5 mL.
Administration	Apply pressure to the lacrimal sac during and for 60 seconds after instillation of eye drop to minimise systemic absorption. Wipe away excess medication. Normal corneal sensitivity can be expected after approximately 1 hour.
Monitoring	
Contraindications	Hypersensitivity to any of the components of the preparation. Eye infection.
Precautions	The cornea may be damaged by prolonged or frequent application of anaesthetic eye drops. Prolonged use of topical ophthalmic local anaesthetics has been associated with severe keratitis and permanent corneal opacification and scarring with accompanying reduction of visual acuity or visual loss. Systemic toxicity typical of local anaesthetics could occur if sufficient amounts were absorbed systemically. Systemic absorption of tetracaine (amethocaine) may be reduced by compressing the lacrimal sac at the medial canthus for a minute during and following the instillation of the drops.
Drug Interactions	Metabolism may be inhibited by anticholinesterases with prolongation of the effects of tetracaine (amethocaine). May competitively enhance the neuromuscular blocking action of suxamethonium.
Adverse Reactions	Local burning and stinging sensation. Blurred vision, keratitis, hyperaemia, lacrimation and allergic conjunctivitis. Systemic (if systemic absorption occurs) – Rare. Apnoea, cardiac arrest, ventricular arrhythmias, irritability and excitation. Prolonged ophthalmic use may lead to severe keratitis and corneal adverse effects.[10] For decontamination after eye exposure, irrigate eyes with sodium chloride 0.9%.
Compatibility	Cyclopentolate, phenylephrine, tropicamide
Incompatibility	No information.
Stability	Discard immediately after use.
Storage	Store at 2°C to 8°C. (Refrigerate. Do not freeze.) Protect from light. Each Minims unit should be discarded after a single use.
Special Comments	Not approved for use in preterm infants by FDA (Food and Drug Administration of USA) in view of the immaturity of the enzyme system that metabolises the ester type of local anaesthetic.[11] The American Academy of Ophthalmology in January 2013 suggested the use of proparacaine to assess premature infants.[12] Proparacaine is not registered in Australia. Consensus among Australian ophthalmologists during the development of this formulary was to continue to use tetracaine(amethocaine) as no reported adverse effects in neonates in Australia.

Evidence summary	**Efficacy:** No clinical trial has assessed the effect of tetracaine (amethocaine) topical eye drops in newborn infants undergoing eye examination for ROP. Three RCTs in newborn infants evaluated the effects of topical anaesthetic eye drops (proparacaine HCL 0.5% ophthalmic solution) during ROP examination [1-3]. Proparacaine eye drops prior to examination were found effective in reducing pain responses and/or the number of infants with high pain scores on eye examination. However, the effect was not great and a substantial proportion of infants still had high pain scores. Another RCT compared topical anaesthetic eye drops (proparacaine HCL 0.5% ophthalmic solution) to oral sucrose during ROP examination [4]. There was no difference between pain scores. Three systematic reviews found that although there is evidence that topical eye anaesthetic reduces pain, its effect is incomplete and screening remains a painful procedure [5]. There is no single pain intervention recommended for ROP examinations [6]. A multi-modal approach to eliminating pain is required. **Conclusion:** Pain Study Group of the Italian Society of Neonatology 2009 recommended, in the case of RetCam screening, applying local anaesthesia with oxybuprocaine 0.4% or tetracaine (amethocaine) 1% eye drops. For laser therapy for ROP, in general, combine a local anaesthetic with a general anaesthesia. [7] **Safety:** There are no safety data for the use of topical amethocaine eye drops in newborn infants. Systematic review [8] of the use of topical tetracaine (amethocaine) gel 4% for procedural pain in newborn infants found three studies reported a statistically significant reduction in pain compared to placebo during venepuncture and one study reported a statistically significant reduction in pain compared to placebo during cannulation. One study reported no statistical difference between the two groups during intramuscular injection. There was no increased risk of local redness, swelling or blanching after use of tetracaine (amethocaine) gel. In adults, instillation of tetracaine (amethocaine) eye drops had a longer and more severe duration of stinging than proxymetacaine 0.5% eye drops [9]. Prolonged ophthalmic use may lead to severe keratitis and corneal adverse effects[10]. **Pharmacokinetics/pharmacodynamics:** No pharmacokinetics reported in newborn infants. Onset of anaesthesia after instillation into the eye is 10 to 20 seconds, and duration of anaesthesia is 10 to 20 minutes (Minims Amethocaine Eye Drops product information).
References	1. Cogen MS, Parker JS, Sleep TE, Elsas FJ, Metz TH, McGwin G. Masked trial of topical anesthesia for retinopathy of prematurity eye examinations. Journal of American Association for Pediatric Ophthalmology and Strabismus 2011;15(1):45-8. 2. Marsh VA, Young WO, Dunaway KK, Kissling GE, Carlos RQ, Jones SM, Shockley DH, Weaver NL, Ransom JL, Gal P. Efficacy of topical anesthetics to reduce pain in premature infants during eye examinations for retinopathy of prematurity. Annals of Pharmacotherapy 2005;39(5):829-33. 3. Mehta M, Mansfield T, VanderVeen DK. Effect of topical anesthesia and age on pain scores during retinopathy of prematurity screening. Journal of perinatology 2010;30(11):731-5. 4. Nesargi SV, Nithyanandam S, Rao S, Nimbalkar S, Bhat S. Topical anesthesia or oral dextrose for the relief of pain in screening for retinopathy of prematurity: a randomized controlled double-blinded trial. Journal of tropical pediatrics 2014;61(1):20-4. 5. Dempsey E, McCreery K. Local anaesthetic eye drops for prevention of pain in preterm infants undergoing screening for retinopathy of prematurity. Cochrane Database of Systematic Reviews 2011. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD007645.pub2/abstract. 6. Francis K, Gephart S. What Is Best Practice for Providing Pain Relief During Retinopathy of Prematurity Eye Examinations?. Advances in Neonatal Care 2016;16(3):220-8.

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Original version Date: 13/03/2018	**Author: NMF Consensus Group**
Current Version number: 1	**Current Version Date:** 13/03/2018
Risk Rating: Medium	**Due for Review:** 13/03/2021

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