

Chapter 11

Diagnostic Agents in the Pediatric Eye Examination

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ABSTRACT

In this chapter, the author reviews the most common topical ophthalmic drops for diagnostic use in a pediatric eye exam. Topical diagnostic agents have become an integral part of an ocular health examination even in infants and young children. Topical local anesthetics are commonly used for eye procedures such as tonometry, gonioscopy, and minor office procedures. The proper use of mydriatic drugs allows clinicians to identify and diagnose various ocular abnormalities that might otherwise go undetected. Cycloplegic refraction is a reliable procedure to determine the true refractive status of patients with accommodative esotropia, pseudomyopia, and latent hyperopia. Cycloplegic refraction is also useful in non-communicative or uncooperative patients and when a functional vision problem is suspected such as when visual acuities do not correlate with symptoms or clinical expectations. Many times, diagnostic drops can help a clinician be more confident of the patient's clinical findings.

INTRODUCTION

Topical diagnostic agents have become the mainstream of an ocular health examination. At times, installation of drops in infants, toddlers and preschool children can be quite a challenge. It is useful to utilize the parents as your helper. Parents can cradle the patients like holding a baby and the practitioner can insert the drop on the nasal aspect of the eye. This chapter will present the most commonly used diagnostic drops in clinic and its use for the pediatric population.

BACKGROUND

This chapter will discuss topical anesthesia, dilation and diagnostic cycloplegic drops. Different concentrations of diagnostic agents and its usage based on the different age groups and the instillation methods will also be covered.

Prior to instilling diagnostic eye drops in children, we need to obtain parental consent from all children younger than 18 years old. Once verbal consent is obtained, briefly explain to the guardian the side effects of the diagnostic agents. Educate the patient and the parents to avoid near task for the next few hours. They can also stay indoor to avoid light sensitivity if necessary.

ANESTHESIA

Topical anesthesia aids in intraocular pressure (IOP) measurements especially with the Goldmann applanation and the Tonopen technique (see section on IOP measurements). There are two basic ophthalmic anesthesia commonly used in clinic. They are Proparacaine Hydrochloride ophthalmic solutions and Fluress ophthalmic solutions.

Proparacaine Hydrochloride Ophthalmic Solutions

Proparacaine Hydrochloride ophthalmic solutions are topical anesthesia used to anesthetize the eye and increase corneal penetration. For older children one drop of Proparacaine can be used to increase corneal penetration followed by Tropicamide 1% and Phenylephrine 2.5% for dilation. In some children where we have limited opportunity to instill drops, we may skip Proparacaine and go straight to the dilating agents. A fluorescent strip can be added to Proparacaine Hydrochloride to measure intraocular pressure. This is a two-step procedure involving the instillation of topical anesthetic followed by separate application of sodium fluorescein strip to anesthetize the cornea prior to applanation.

Fluress Ophthalmic Solutions

Fluress is an ophthalmic combination drop that consists of fluorescein sodium and benoxinate hydrochloride. It can also be used as an ophthalmic anesthesia prior to tonometry measurements instead of the two-step procedure with Proparacaine Hydrochloride and a fluorescent strip.

Figure 1 shows a picture of Proparacaine HCL ophthalmic solution, Figure 2 shows a picture of Fluress strip and Figure 3 shows a picture of Fluress which is the combination fluorescein and anesthesia.

In clinic we usually use Fluress to measure IOP with Goldmann applanation tonometry followed by dilation drops and cycloplegic drops if needed. In younger children where we are not measuring Goldmann applanation tonometry, we tend to use Proparacaine followed by dilation drops and/or cycloplegic drops such as Tropicamide, Phenylephrine and Cyclopentolate to increase corneal penetration.

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