

Review: Retinal Photography

What is Retinal Photography?

Also known as "Fundus Photography", Retinal photography is photographic documentation of the features in the back of the eye. A specialized camera system uses intricate optics and a focused light source to allow light to pass through the eye and return back to the imaging sensor.¹

Why is Retinal Photography performed?

Retinal Photography is used to inspect, document, and follow anomalies associated to diseases that affect the back of eye. Retinal Photography is even used to identify many disease processes outside of the eye, such as multiple sclerosis, diabetes, and brain tumors.¹

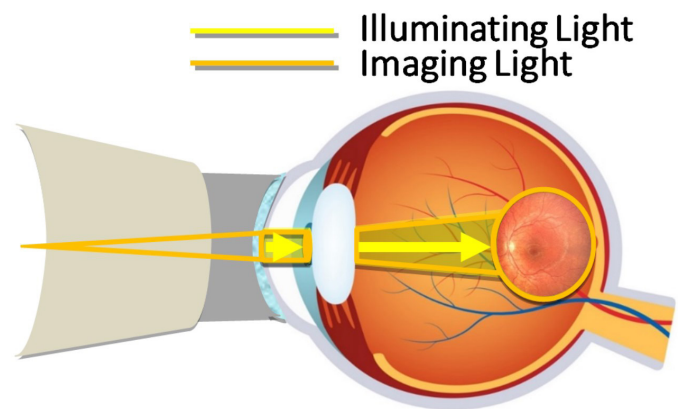
As related to pediatric eye disease, Retinal Photography is used to document the extent of a possible disease. For example in ROP, imaging is used to document how far the retina has vascularized, if any disease is present, and how severe those findings may be.²

In Retinoblastoma, photography is used to document the size and extent of tumors, their growth patterns, and to document the success of treatments. In Abusive Head Trauma, retinal photography is used to prove that with retinal hemorrhaging covering much of the retina and many layers of the retina, abuse is a likely cause.²



What is the Theory of Operation for Retinal Photography with the RetCam?

With the RetCam, illuminating light from the camera will advance through the cornea, the anterior chamber, the dilated pupil, the vitreous humor, and on to the retina. Once the retina (fundus) is illuminated, the imaging light ray will return to the camera sensor to produce a retinal image. It is important that all these ocular structures be clear of artifacts such as haze. Any structure that blocks illuminating light from getting into the eye will then effect imaging light returning to the sensor and will effect image quality.¹



How is Retinal Photography performed?

A clear based ophthalmic coupling gel is applied to the front of the eye. It is important that the gel be viscous as it will act as a barrier between the eye and the lens tip. The gel also acts as refractive agent by bridging any gaps between the eye and camera as peripheral imaging is done and focusing light to the retina. Only gentle physical contact between the coupling gel and the lens is necessary. Ensure the camera is supported (held) in a manner that does not put direct pressure on the cornea. Natus recommends practice with the simulator eye model before imaging a patient.¹



1. Fundus Imaging - Ophthalmic Photographers' Society, www.opsweb.org/page/fundusimaging.

2. Sisk R.A., Zamora B.G. (2016) Retinal Imaging for Pediatric Patients. In: Traboulsi E., Utz V. (eds) Practical Management of Pediatric Ocular Disorders and Strabismus. Springer, New York, NY.

Checklist: Basic RetCam Imaging

Below you'll find a checklist to prepare yourself for a successful imaging session. You may find that based on your imaging needs some steps are more essential than others. We recommend highlighting the items you find most helpful.

Supplies:

Have all your supplies ready prior to imaging

- Topical anesthetic and dilating drops
- Clear base ophthalmic coupling gel
- Appropriate size sterile lid speculum (recommend 2 on hand)
- Gauze
- Gloves
- 70% Isopropyl alcohol to clean lens
- Sterile water to rinse lens tip
- Blanket to wrap or bundle infant
- Comfort measures for Infant

Preparing the Patient: Always make sure the patient is appropriately prepared for successful imaging

- Verify medical order for imaging
- Verify there are no contraindications for imaging
- Dilate patient according to medical orders. Proper dilation takes 30 – 45 minutes. Pupillary dilation of at least 6mm is required
- Secure the patient with a blanket swaddle and ensure that all lines are clear or secure for imaging
- Bedside nurse may assist with infant comfort measures as well as holding, positioning, swaddling, and monitoring patient stability
- Apply topical anesthetic to the eye
- Insert the appropriate size lid speculum
- Apply a moderate amount of clear base ophthalmic coupling gel to the front of eye or lens of camera. Re-apply gel as needed while imaging
- RetCam®

For imaging using retinal lenses: (external and retinal imaging)

Orient the handpiece so that the fiber-optic cable extends toward the child's forehead (toward imager). This will ensure the image is oriented correctly on the screen.

For imaging using the portrait lens: (external imaging)

Orient the handpiece so that the fiber-optic cable extends toward the child's feet (away from imager). This will ensure the image is oriented correctly on the screen.

Preparing the RetCam: It is helpful to have the system powered on and patient information entered

- Place yourself at the head of the supine patient
- Position the RetCam system at the bedside facing you
- Adjust Monitor for unobstructed viewing
- Adjust room lighting
- Check connections on RetCam system
- Make sure the footswitch or imaging membrane is with comfortable reach
- Carefully inspect and clean the lens piece before each use. DO NOT use if the lens piece has nicks, breaks, scratches, or rough surfaces that can damage the eye
- Attach the desired lens to the handpiece (confirm audible click)

Prepare for Imaging: It is important to understand proper camera orientation and imaging techniques

- Prepare proper focus prior to imaging
- Drape the camera fiber-optic cable over your shoulder
- Hold the camera near the tip of the lens (like a large pencil). You may find gently placing your pinky finger on the infant's temple or balancing your wrist on a rolled blanket helps with camera stability
- Check patient for proper dilation prior to starting imaging session
- Check that correct eye and lens are labeled in RetCam system
- Do not put heavy pressure on the eye during the examination
- When needed, set the Range function to adjust the gamma correction and the black level of an image

NOTES:

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