



optomap color rg



optomap color rgb



optomap Red-free (green channel)



optomap red channel (Choroidal)

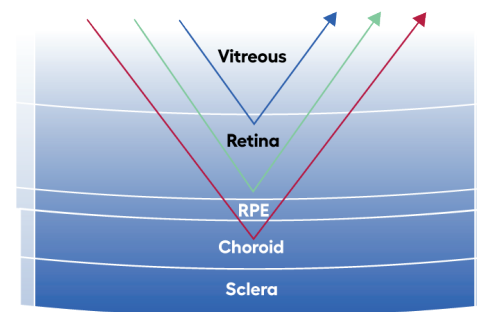
Optos devices produce ultra-widefield (UWF™), high resolution digital images (**optomap**) of approximately 82% (200°) of the retina, documenting from the macula and beyond the vortex ampullae, something no other device is capable of capturing in a single image. **optomap** images provide clinical information which facilitates the early detection, management and effective treatment of retinal and systemic diseases.

Now with 10 imaging modalities, Optos devices provide clinicians with clear, comprehensive views of the retina without needing to montage multiple images. In one capture, some Optos devices provide four images: **optomap color rg**, **optomap color rgb**, **optomap sensory (Red-free)** and **optomap Choroidal** (red channel). On some Optos devices, **optomap** can be used for planning OCT scans which provide cross sectional views of the retina registered to the **optomap** where nearly all retinal layers can be visualized.

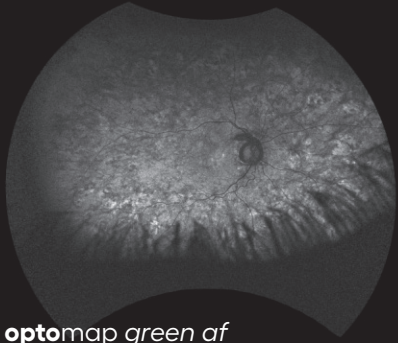
optomap color rg images consist of an **optomap Choroidal** or red channel image (635nm) which visualizes the choroidal layer and **optomap sensory** which is a **Red-free** image known as the green channel (532nm) visualizing the retinal pigment epithelium (RPE). This modality is available on all Optos devices.

optomap color rgb images include a third wavelength, blue (488nm), which provides additional information about the vitreoretinal interface, the structures anterior to the retina. The composite image consisting of all three wavelengths provides a more natural looking view of the retina.

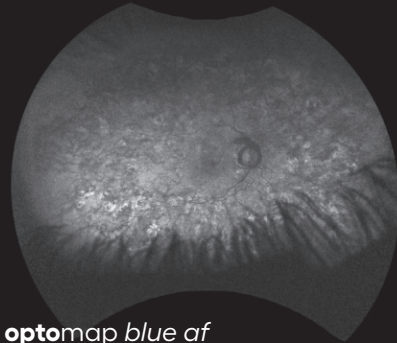
optomap Scanning Lasers



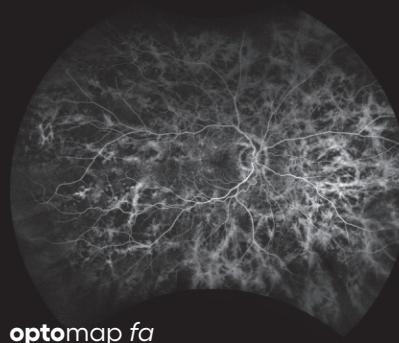
Green laser (532nm) laser scans from sensory retina to RPE.
 Red laser (635nm) scans from the RPE to the choroid.
 Blue laser (488nm) scans internal limiting membrane and vitreous interface.
 Infrared laser (802nm) is used in indocyanine green angiography procedures.
 (Not shown graphically)



optomap green af



optomap blue af



optomap fa



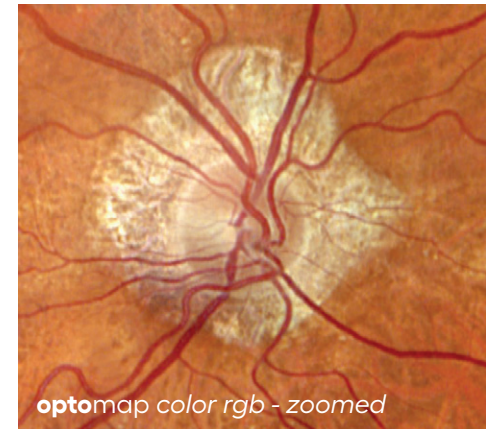
optomap icg

optomap green af images are captured using the green wavelength (532nm) and visualize the function of the RPE. This modality is available on all Optos devices.

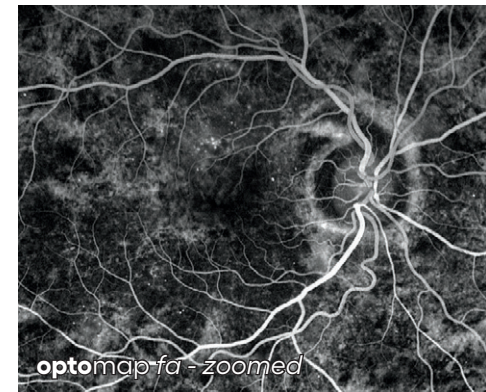
optomap blue af images are captured using the blue wavelength (488nm) and visualize the function of the RPE.

optomap fa images are captured using the blue wavelength (488nm) to visualize the circulation of the retina vasculature.

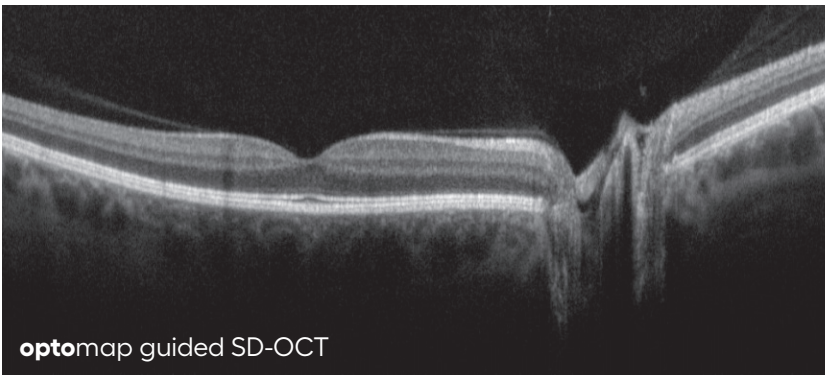
optomap icg images are captured using the infrared wavelength (802nm) to visualize the circulation of the choroidal vasculature. Interweave imaging is available to track circulation of the retina and the choroid in tandem.



optomap color rgb - zoomed



optomap fa - zoomed



optomap guided SD-OCT

The **Retina** is the light-sensitive layer of tissue that lines the inside of the eye and sends visual information through the optic nerve to the brain.

The **Choroid** is the vascular (major blood vessel) layer of the eye lying between the retina and the sclera providing nourishment to the retina. It can be visualized using the red channel of an **optomap** image or at the very bottom of an OCT scan.

The **Vitreous** is the clear 'jelly' like liquid that fills the eye from the lens to the Internal Limiting Membrane (ILM).

Vortex Vein is large veins that mark the anatomical equator and where the choroidal veins drain. There is at least one vortex ampulla per quadrant but there may be more.

Vein is any of the tubes forming part of the blood circulation system of the body, carrying in most cases oxygen-depleted blood toward the heart.

Macula is a small central area of the retina surrounding the fovea; area of acute central vision.

Artery is a blood vessel forming part of the circulation system by which blood (mainly that which has been oxygenated) is conveyed from the heart to all parts of the body.

Nerve Fiber Layer (NFL)

Optic Nerve Head (ONH) is the ocular end of the optic nerve. Denotes the exit of retinal nerve fibers from the eye and entrance of blood vessels to the eye.

Fovea is the central pit in the macula that produces the sharpest and most detailed vision. It contains a high concentration of cones and no retinal blood vessels.

The **Internal Limiting Membrane (ILM)** is a thin membrane that covers the retinal surface in between the retina and vitreous.

The **Nerve Fiber Layer (NFL)** is made up of nerve fiber bundles which are axons of ganglion cells that carry the visual signal from the ganglion cell in the retina to the brain (forming the optic nerve). It appears as bright bands coming out from the optic nerve on **optomap** or a bright band on top of the retina in OCT.

The **Ganglion Cell Layer** is made up of the ganglion cell bodies. It appears as a dark band on the OCT below the NFL.

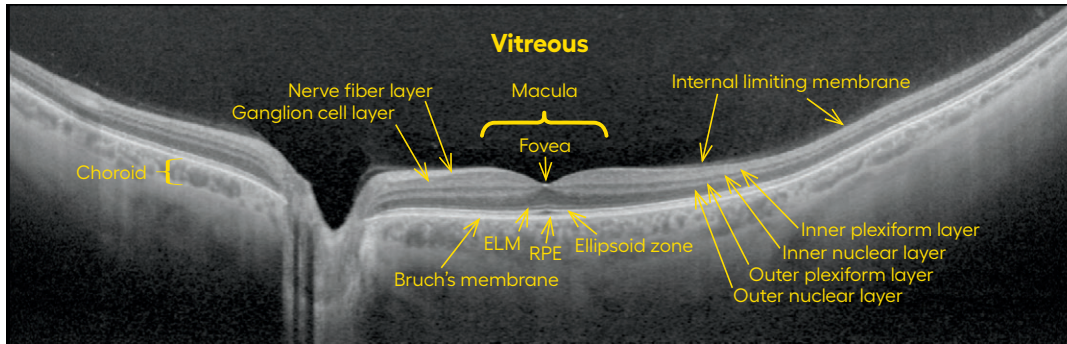
The **Inner Plexiform Layer** consists of ganglion cell dendrites where ganglion cells connect to bipolar cells and amacrine cells. It appears as a bright band on OCT.

The **Inner Nuclear Layer** is where bipolar, horizontal, and amacrine cell bodies are located, it appears as a dark band on OCT.

The **Outer Plexiform Layer** is where bipolar and horizontal cells connect to photoreceptors it appears as a bright band on OCT.

The **Outer Nuclear Layer** is where photoreceptor cell bodies are located (rods and cones) it appears as a dark band on OCT.

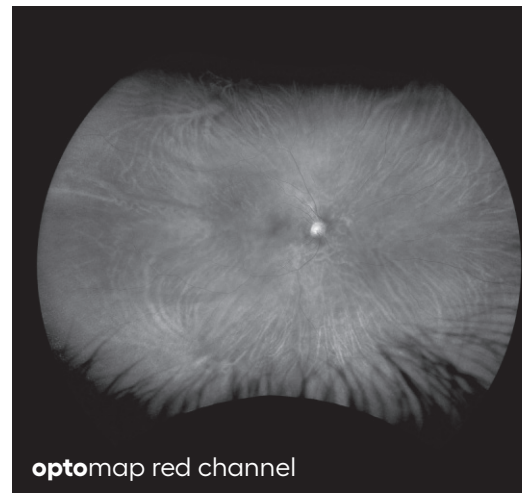
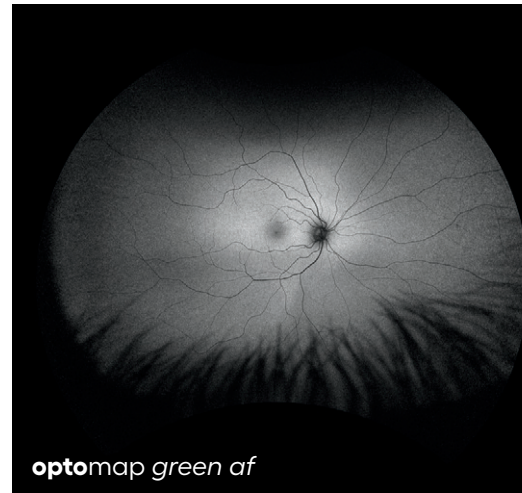
The **Bruch's Membrane** is a thin layer separating the RPE from the choriocapillaris.



The **Ellipsoid Zone** is a bright band that separates the inner and outer areas of photoreceptors (sometimes referred to as the IS/OS junction).

The **Retinal Pigment Epithelium (RPE)** is a thin pigmented layer that nourishes the photoreceptor layer. It is visualized on the green channel or **optomap Red-free** image or as a bright band at the bottom of an OCT just above Bruch's membrane.

The **External Limiting Membrane** is a thin layer near the bottom of the retina separating the photoreceptor inner and outer areas from their cell bodies.

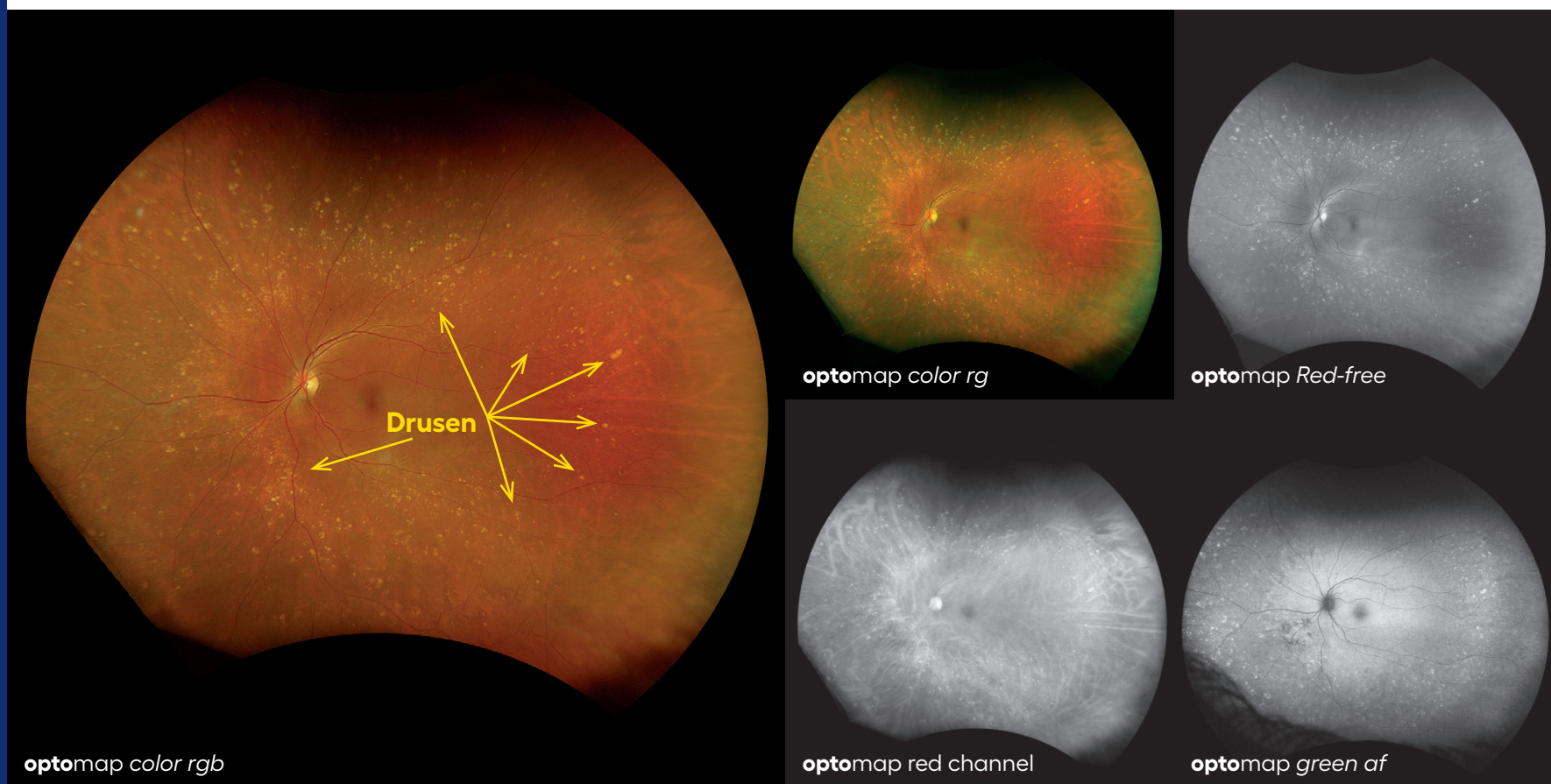


Age-Related Macular Degeneration (AMD)

is a common eye disease in older individuals that involves deterioration of the macula, resulting in loss of sharp central vision. Optos devices allow for multimodal assessment of this condition which impacts the retina and choroid.

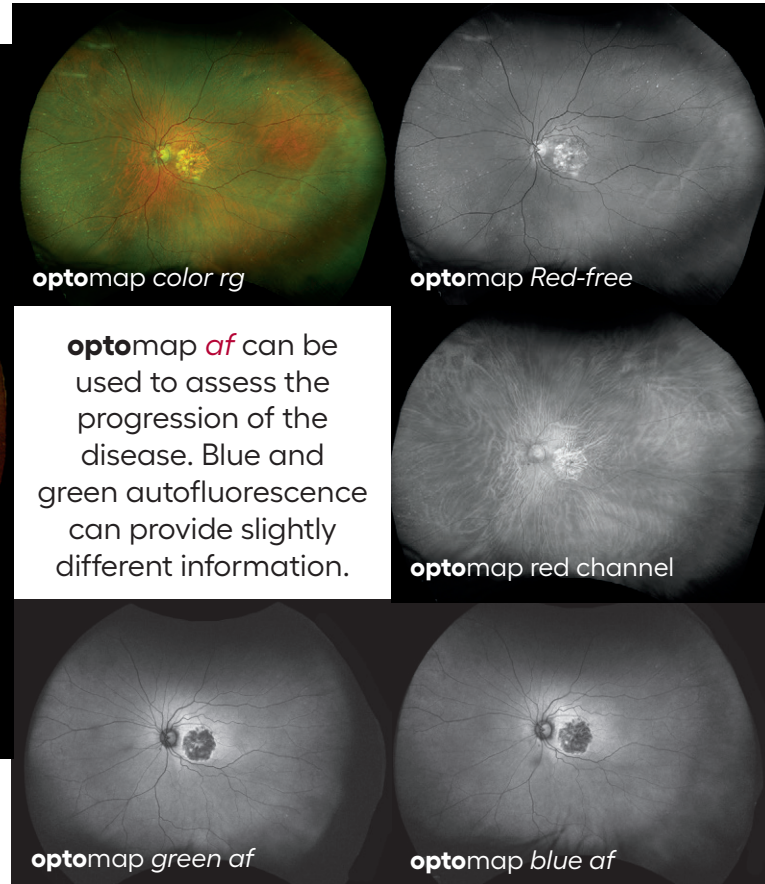
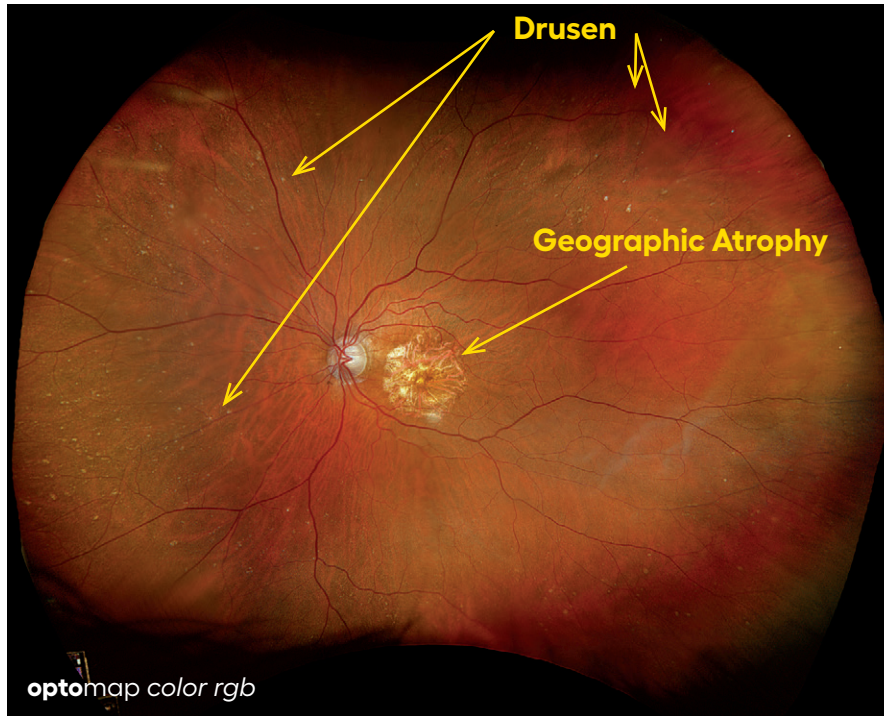
Dry AMD is when geographic atrophy or drusen are present at the level of the RPE.

Drusen are a feature of AMD; they are small lipid deposits on Bruch's membrane or RPE. They appear as yellow spots on the **optomap** image and clinically as white bumps on OCT.



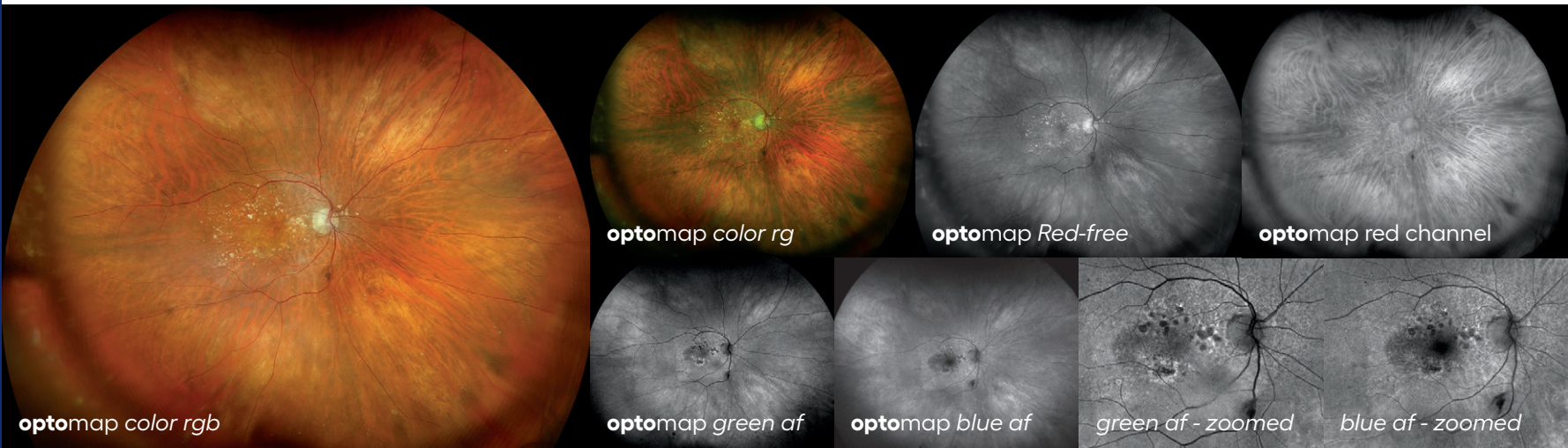
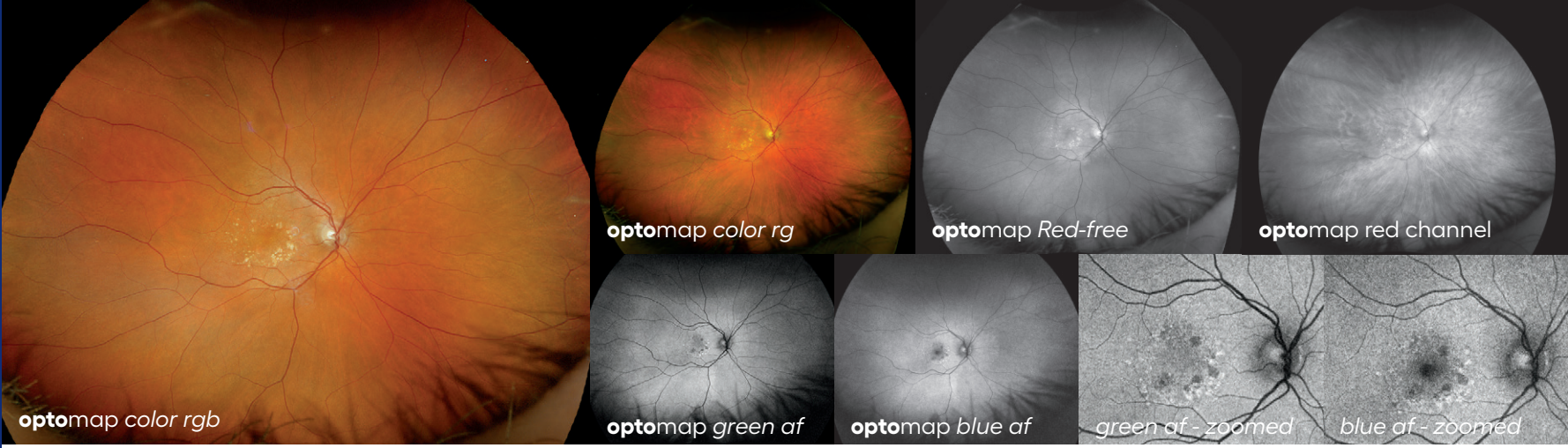
Geographic Atrophy (GA)

is a type of dry AMD where the RPE is atrophic and no longer functioning. This causes the photoreceptors to also die resulting in vision loss. On the OCT, GA shows up as hyperreflective 'column' below the RPE layer. Retinal atrophy above the GA is also present.



Optos**Advance**TM has validated measurement tools which allow for accurate assessment of lesion size and overlays which easily demonstrates change over time.

Age-Related Macular Degeneration



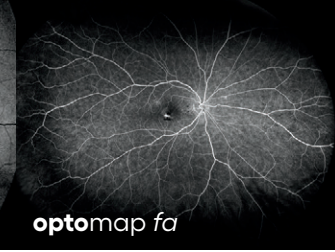
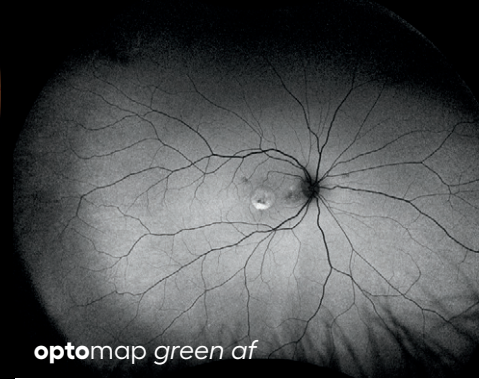
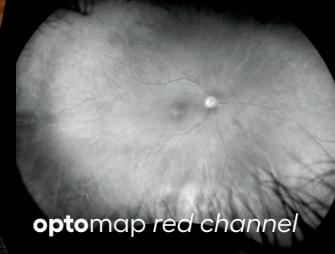
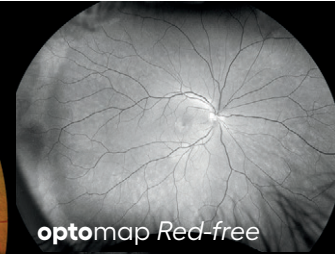
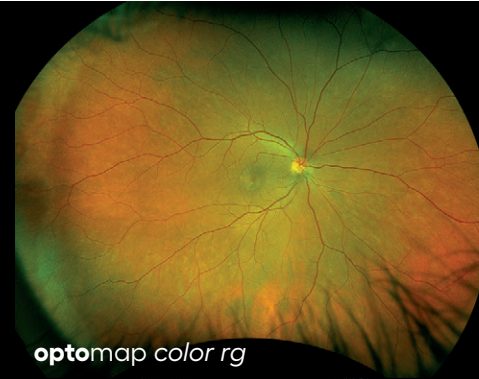
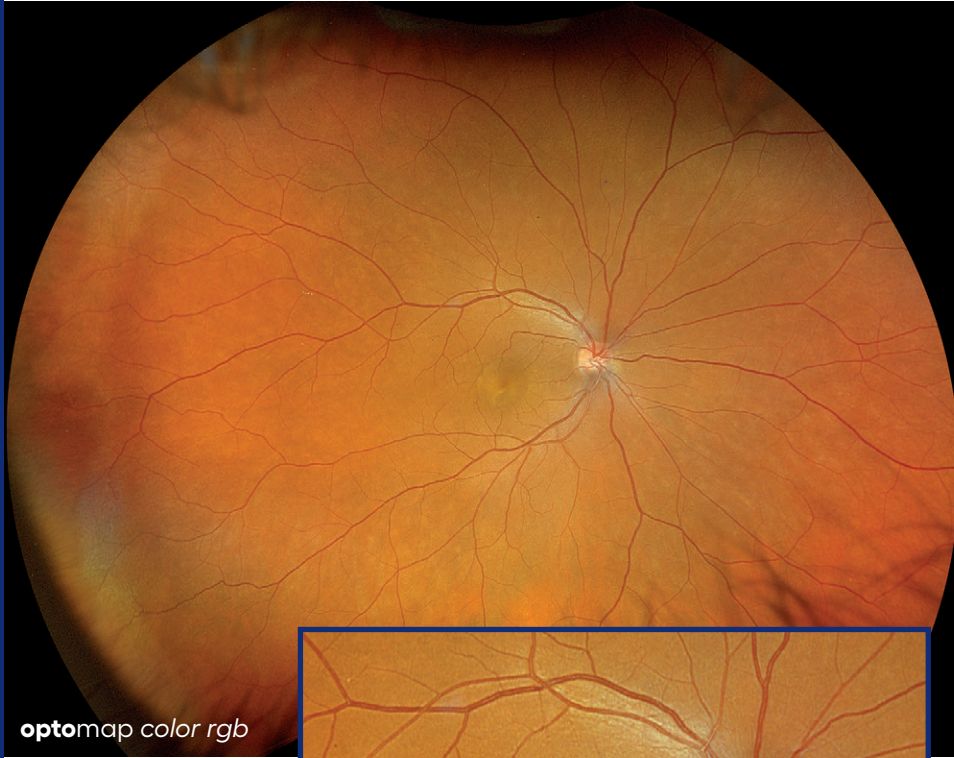
Wet AMD

is when there is choroidal neovascularization (CNV) present in or below the retina. These new vessels leak fluid into the retina causing edema and can lead to blindness.



Central Serous Retinopathy, Serous Chorioretinopathy (CSR)

is a blister-like elevation of sensory retina in the macula, with a localized detachment from the pigment epithelium. This results in reduction and/or distortion of vision that usually recovers within a few months.



Choroidal Folds

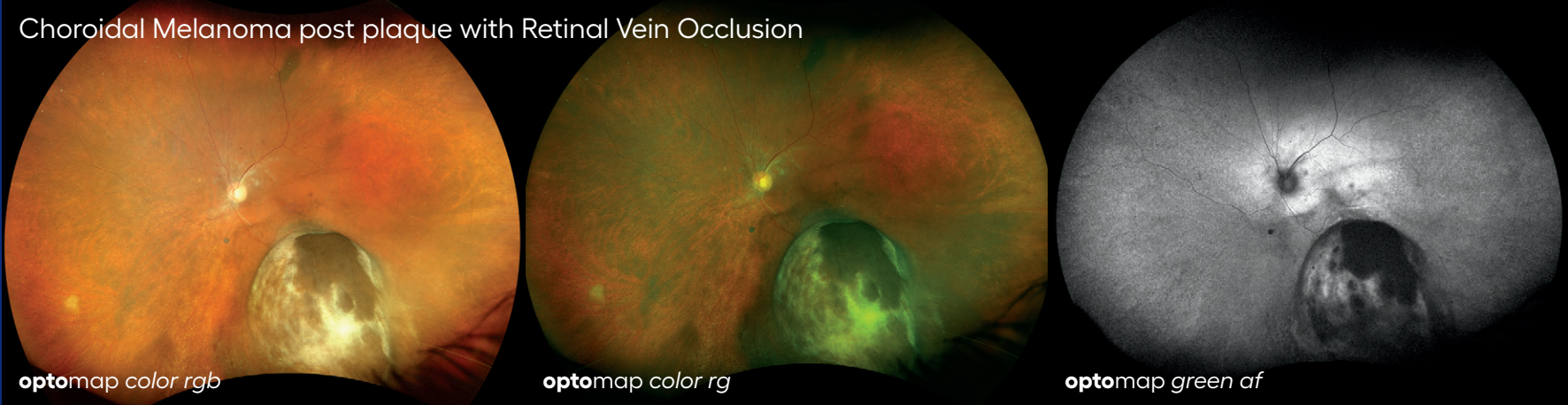
are lines, grooves or striae which appear as alternating light and dark lines arranged in a parallel and horizontal fashion but may be vertical, oblique, or irregular. These folds reflect the undulations of the choroid, retinal pigment epithelium (RPE) and the overlying neurosensory retina and tend to vary in length and width.



Choroidal Melanoma

is a malignant tumor arising from the pigmented cells of the choroid.

Choroidal Melanoma post plaque with Retinal Vein Occlusion



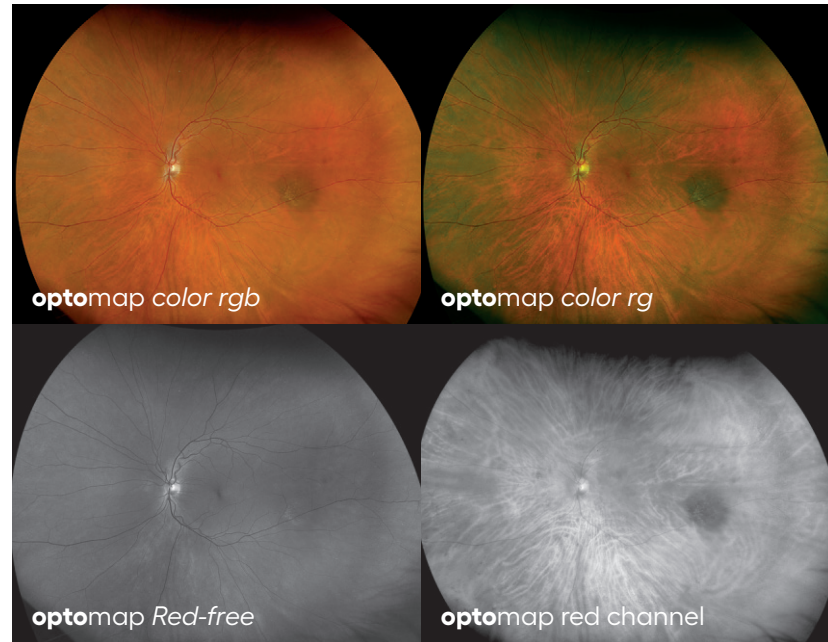
Choroidal Melanoma with radiation retinopathy



Pigmented Lesions

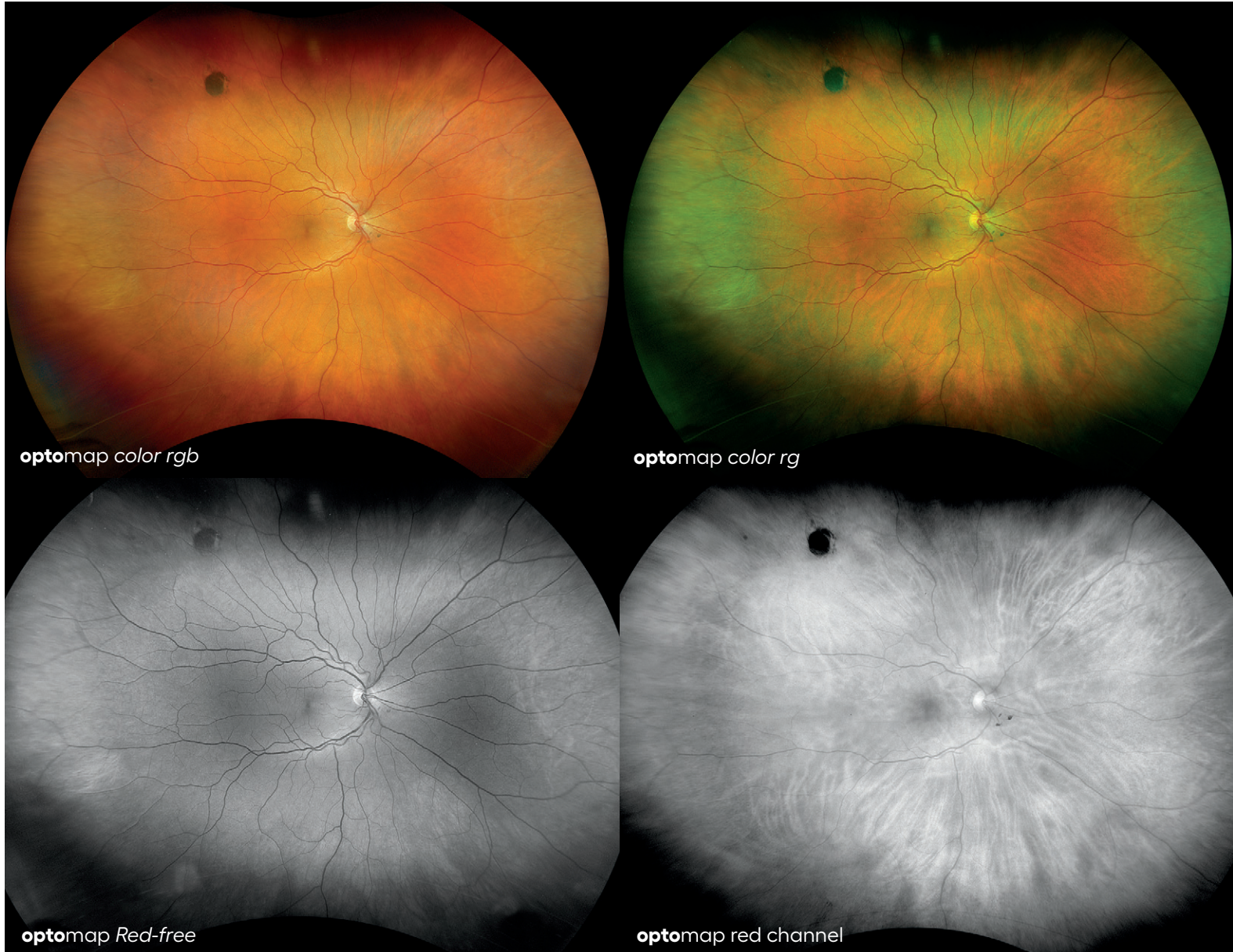
including nevi and tumors benefit from multimodal imaging which can help discern the location, size and whether fluid is present.

A Choroidal Nevus is an accumulation of melanocytes in the choroid. It is a space occupying mass or a benign melanoma. Choroidal nevi are slate gray in color, have indistinct margins, and may be slightly elevated (1-2 diopters). Since they are in the choroid, they are usually only seen in the red separation and not the green. The green separation may show the RPE degeneration associated with nevi which is seen as pigment mottling and drusen.



Congenital Hypertrophy of the RPE (CHRPE)

is a generally asymptomatic congenital hamartoma of the retina. Clinically, they appear as flat, round pigmented lesions.

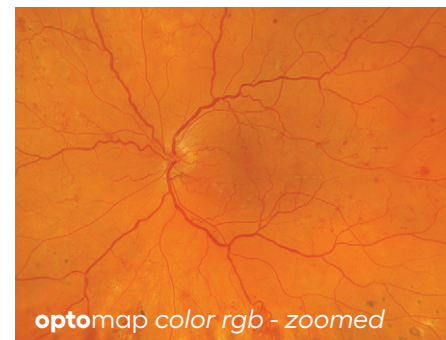
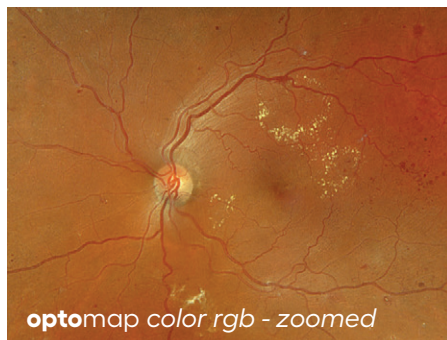
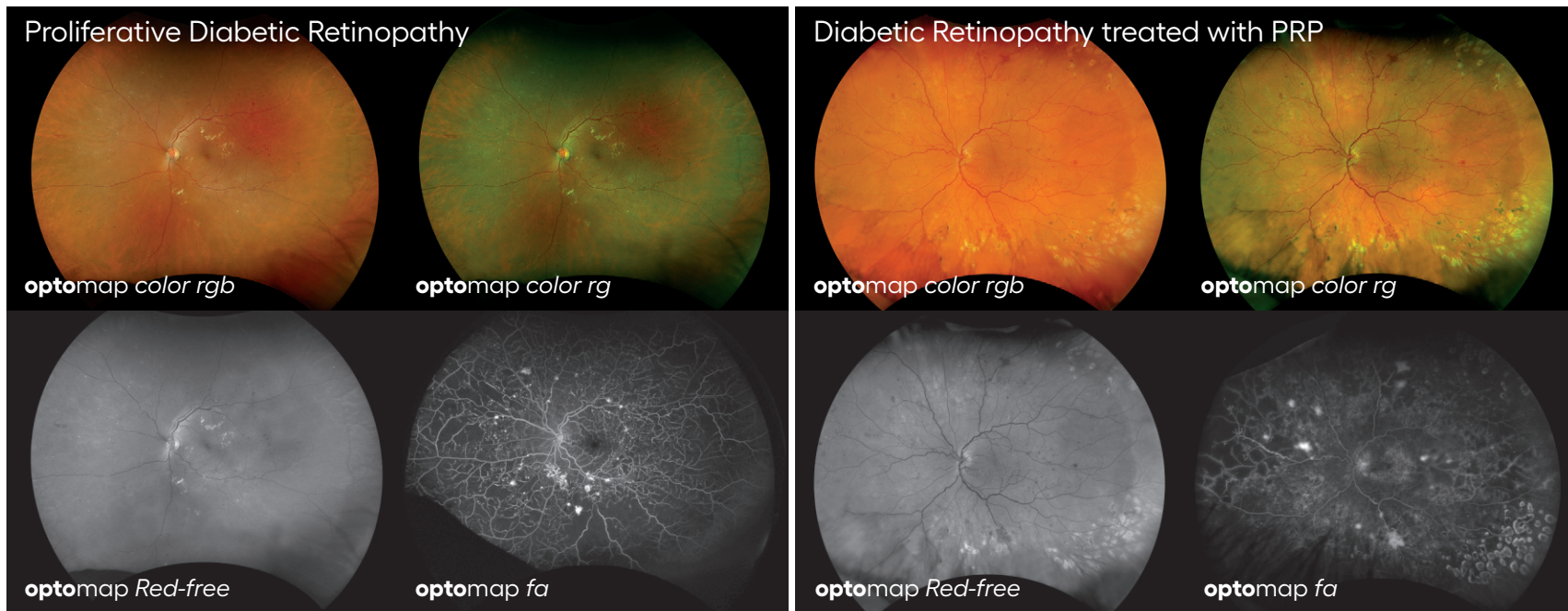


Diabetic Retinopathy (DR)

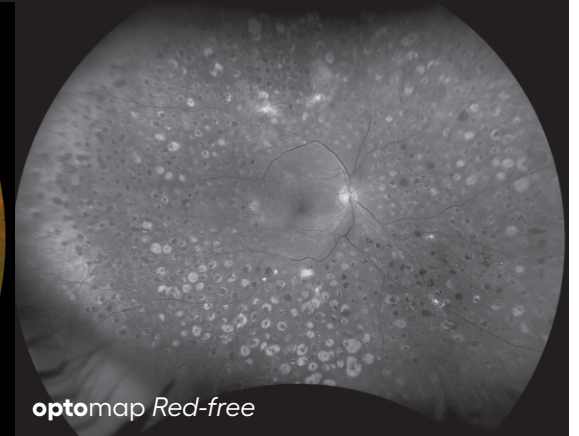
is an ocular disease caused by diabetes mellitus. There are many stages of DR ranging from mild to severe which can lead to blindness.

Non-proliferative diabetic retinopathy (NPDR) is the early stage of diabetic retinopathy where there is no neovascularization but there are other lesions such as hemorrhages and microaneurysms.

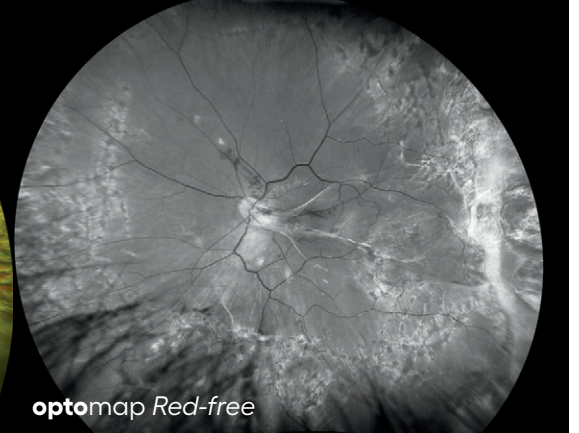
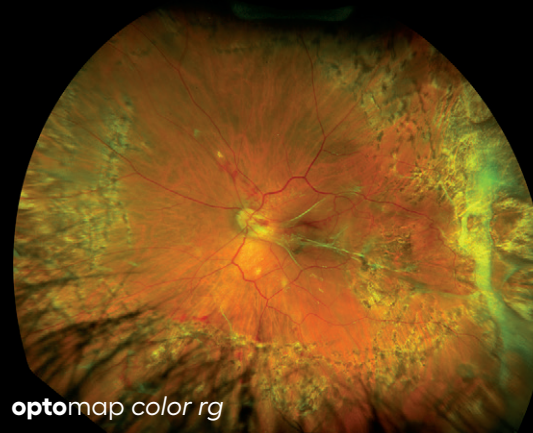
Proliferative diabetic retinopathy (PDR) means neovascularization is present and the new blood vessels are typically leaking fluid and blood.



Diabetic Retinopathy treated with Panretinal Photocoagulation

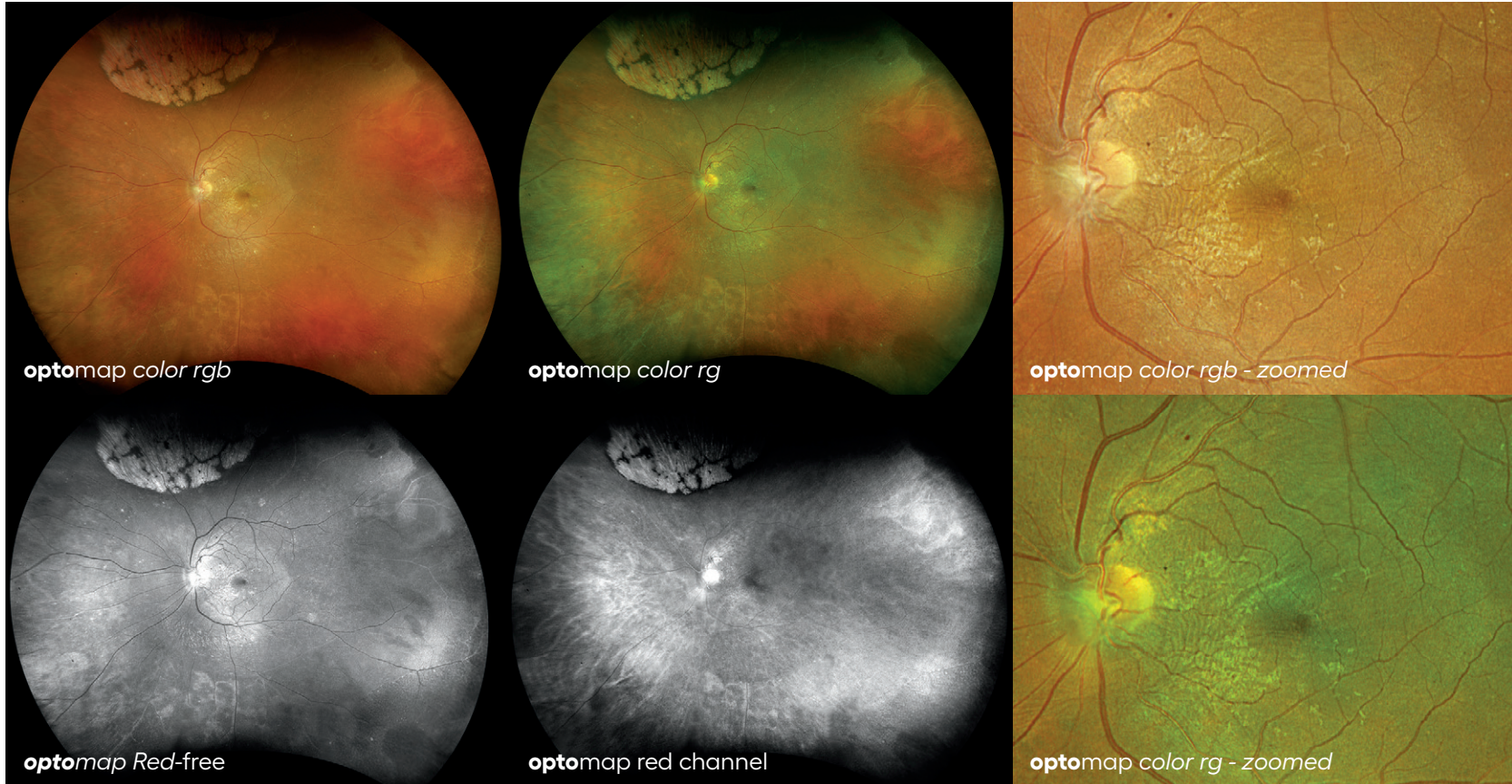


Diabetic Retinopathy treated with Panretinal Photocoagulation with vitreous traction



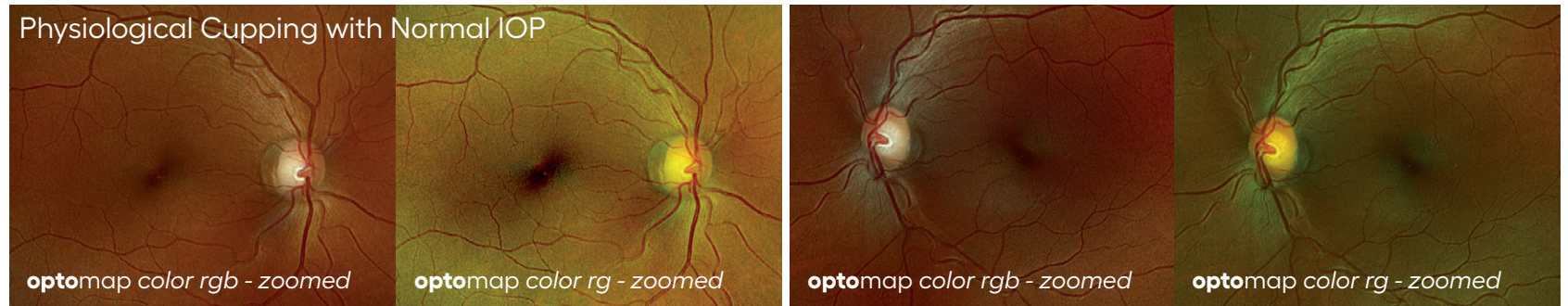
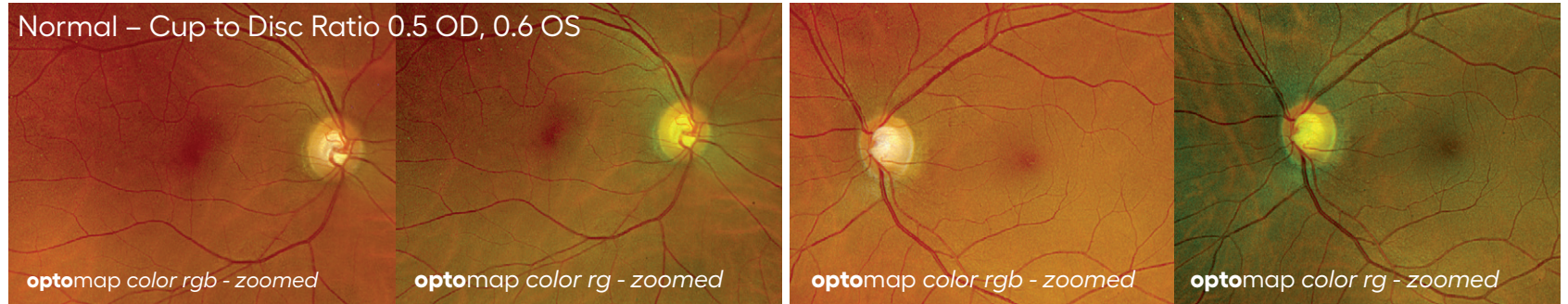
Epiretinal Membrane (ERM)

is a thin sheet of fibrous tissue that can develop on the surface of the macular area of the retina and can cause a disturbance in vision. It can sometimes pull on the retina and cause vitreo-macular traction (VMT) potentially leading to a macular hole.



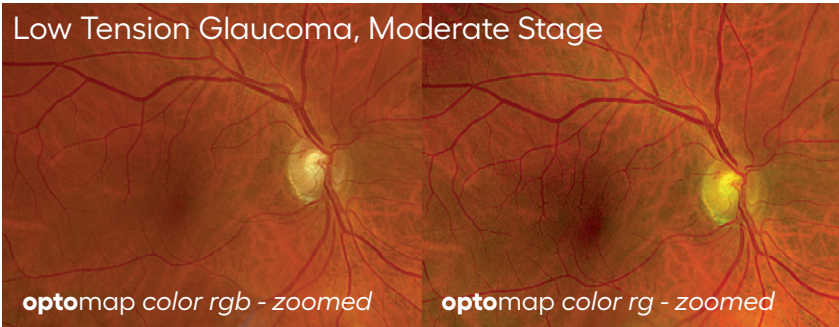
Glaucoma

is a progressive optic neuropathy where ganglion cells prematurely die resulting in a thinning of the Nerve Fiber Layer (NFL), cupping of the optic nerve, and visual field defects.

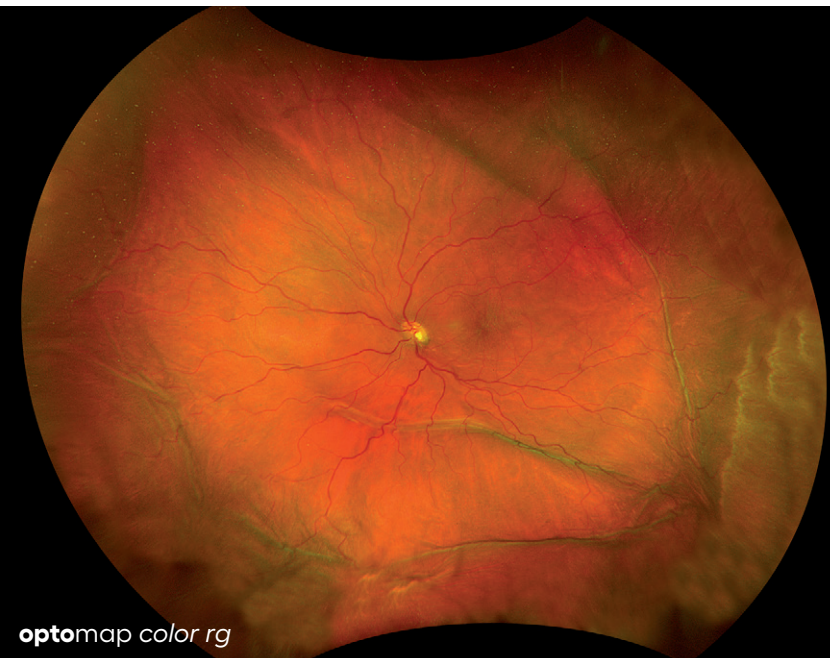
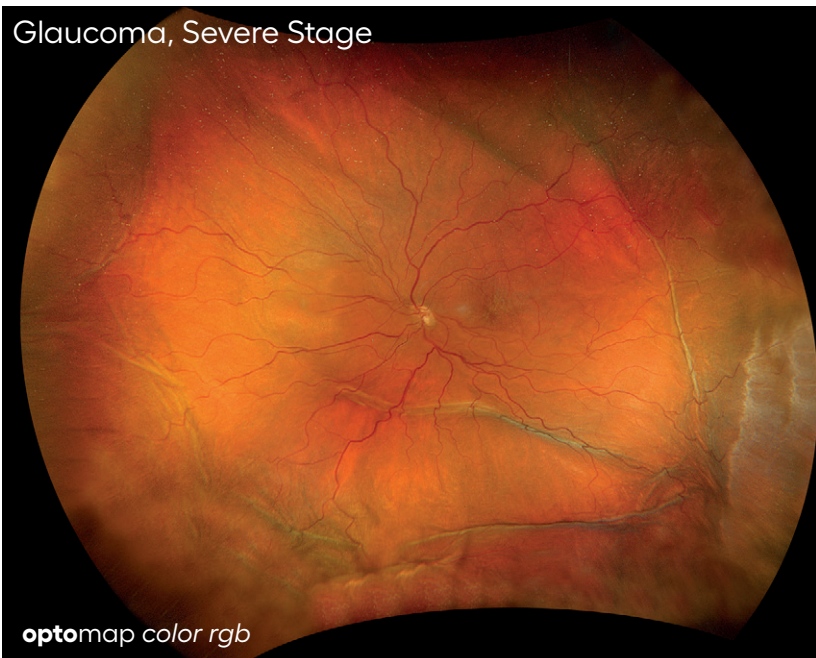


Optos**Advance** provides the ability to measure cup to disc ratio, segment the OCT layers and assess thinning of the NFL.

Low Tension Glaucoma, Moderate Stage

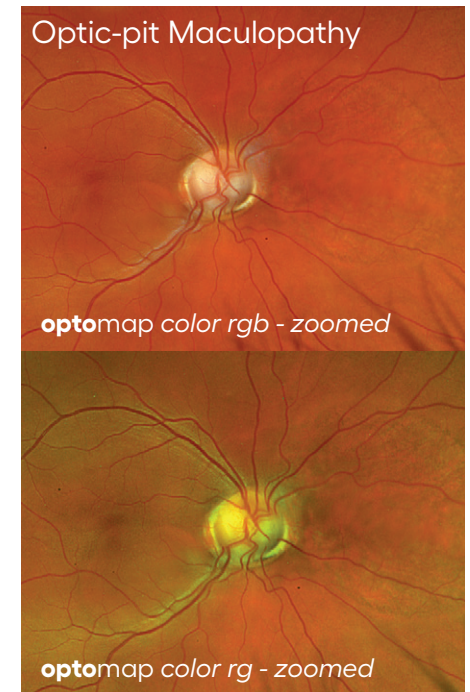
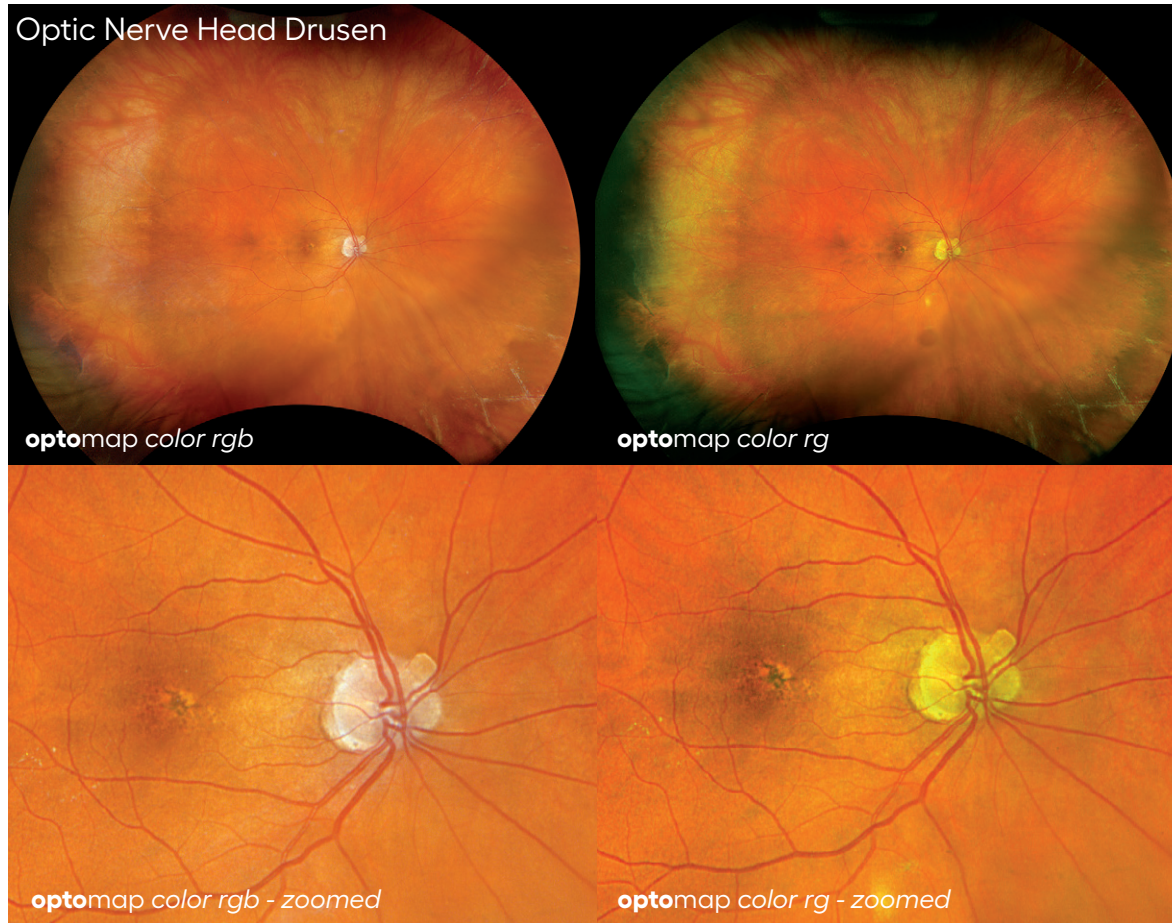


Glaucoma, Severe Stage



Optic Nerve Head Drusen

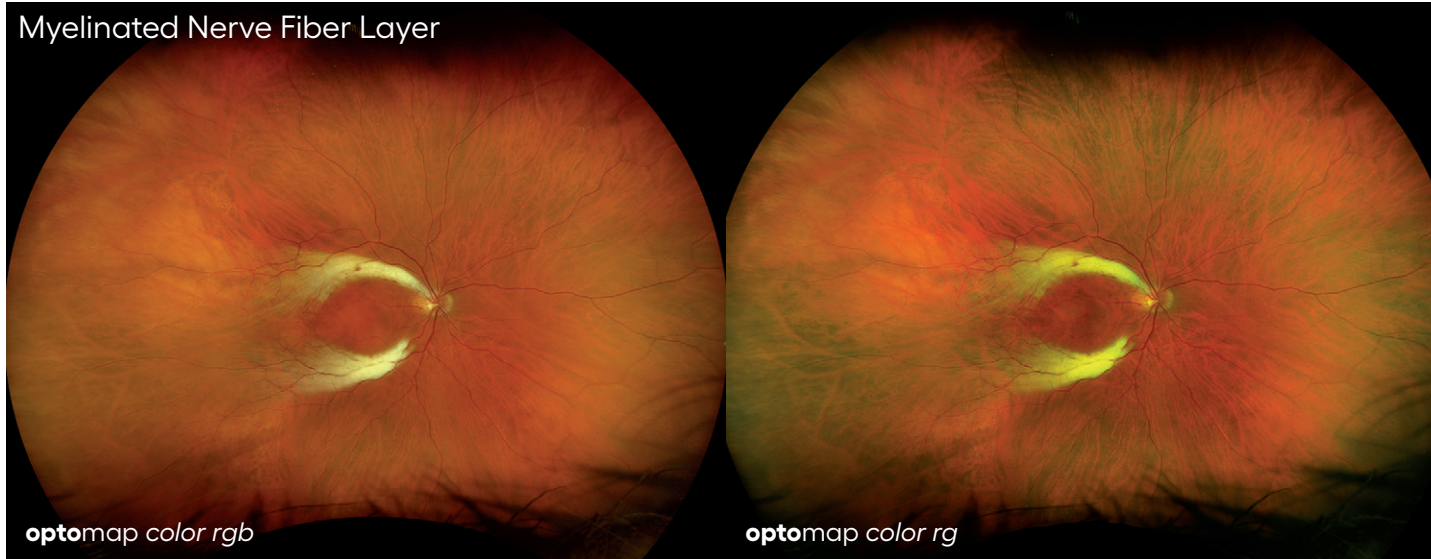
are a hereditary anomaly appearing with blurred and/or irregular disc margins, giving the appearance of pseudopapilledema. Small, buried drusen may cause only subtle elevation of the disc and obscuration of the physiologic cup, giving the appearance of a crowded disc. Larger, more diffuse drusen may appear as multilobular yellowish-white or pinkish nodules.



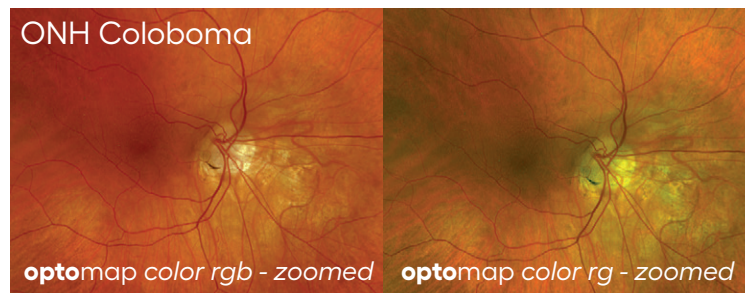
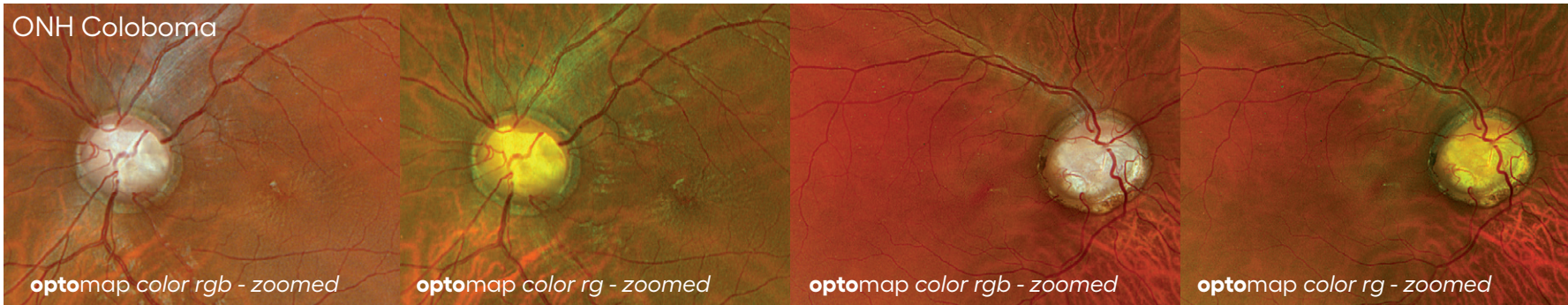
Optic-pit maculopathy is associated with optic disc pits which are congenital unilateral excavations of the optic nerve head that may be associated with other abnormalities of the optic nerve and peripapillary retina. Some cases may develop complications such as associated maculopathy, characterized by retinoschisis-like changes and serous macular detachment.

Myelinated Never Fiber Layer

are retinal nerve fibers that, unlike normal retinal nerve fibers, have a myelin sheath.

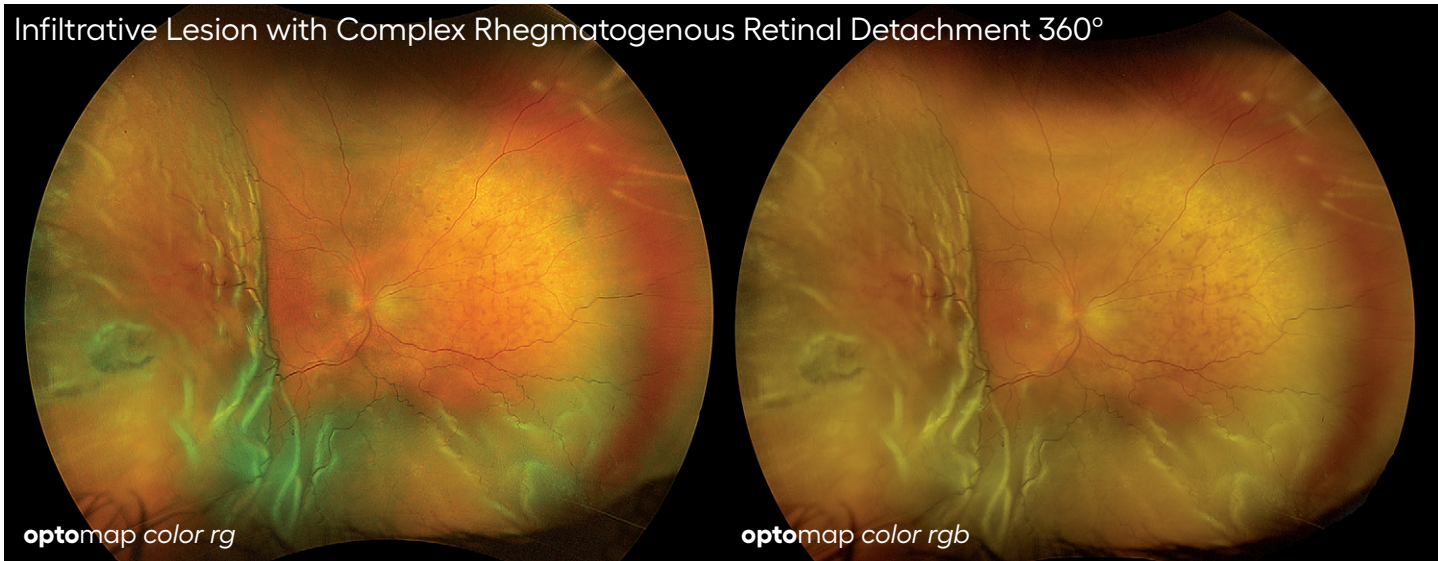
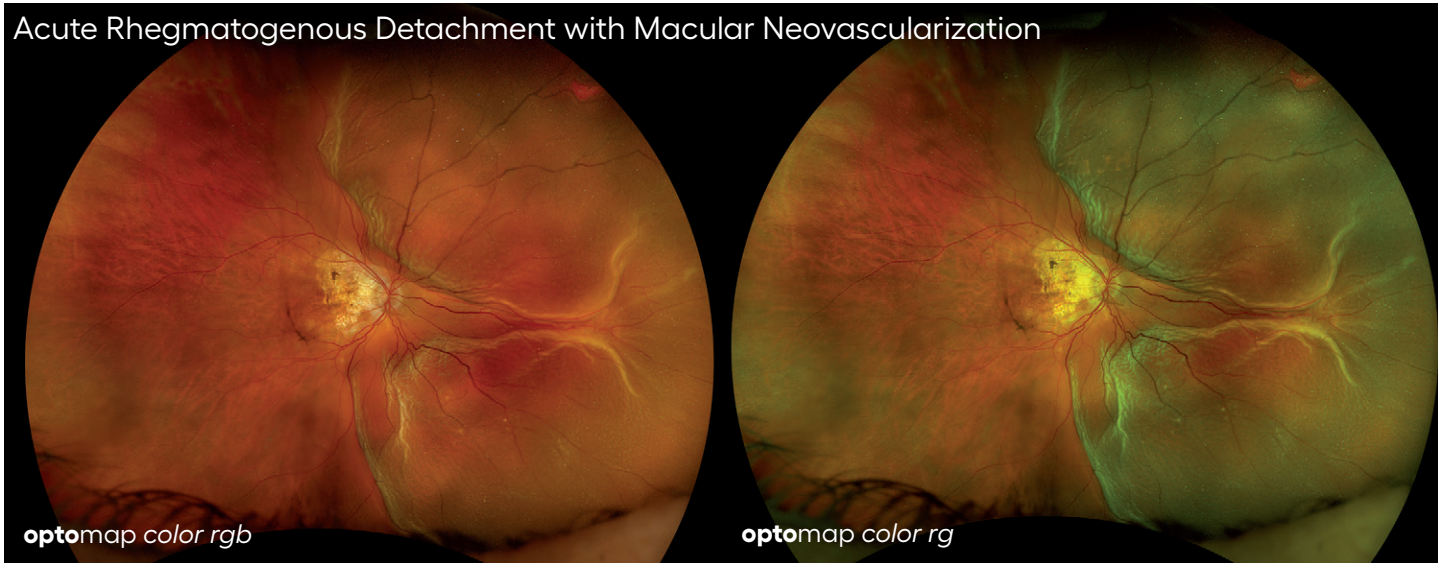


Optic nerve head (ONH) coloboma is a congenital condition characterized by a bowl shaped excavation with sharp borders.



Retinal Detachment

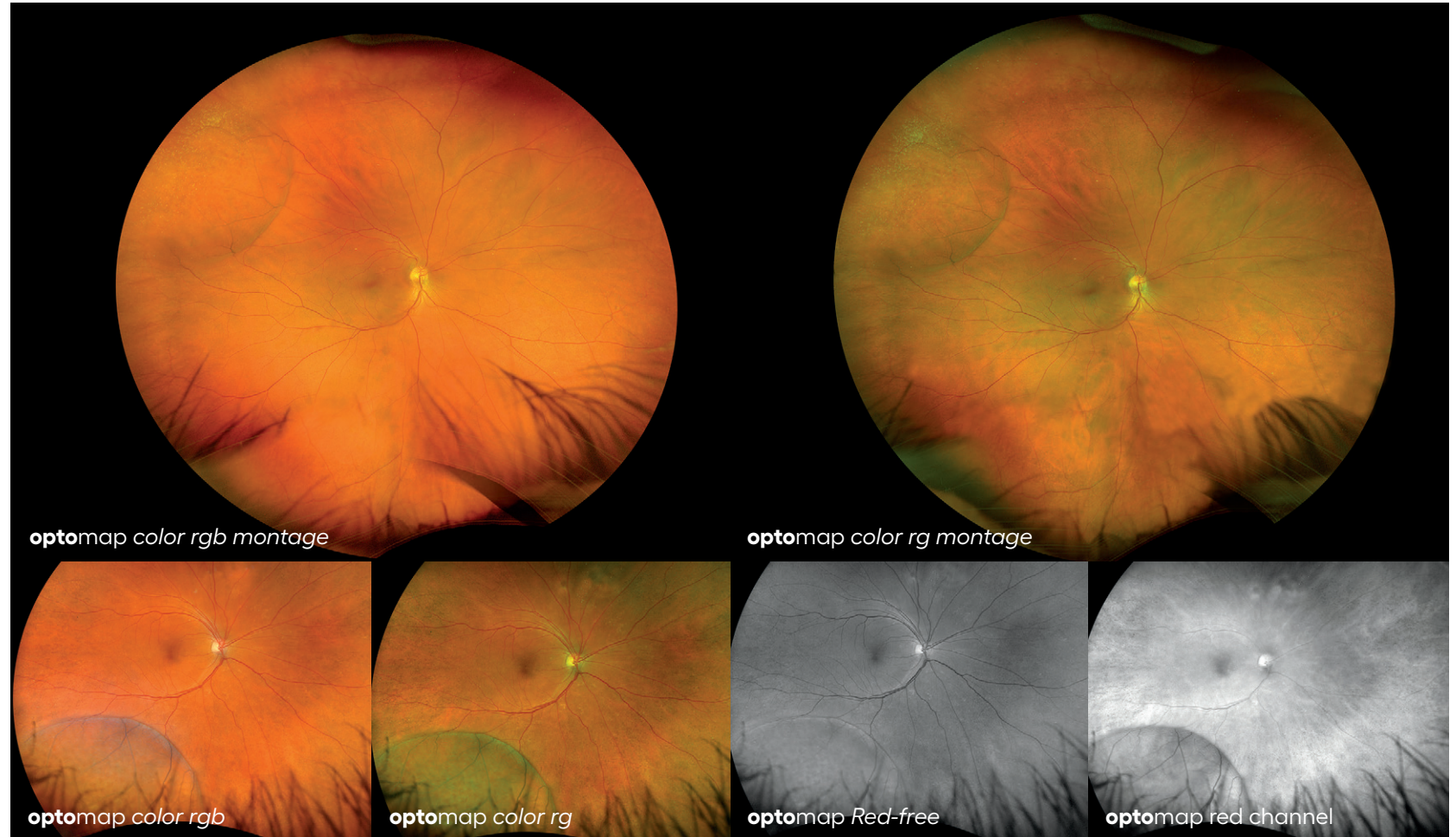
is the separation of the sensory retina from the Retinal Pigment Epithelium (RPE) (outer segments of the photoreceptors from the microvilli of the RPE).





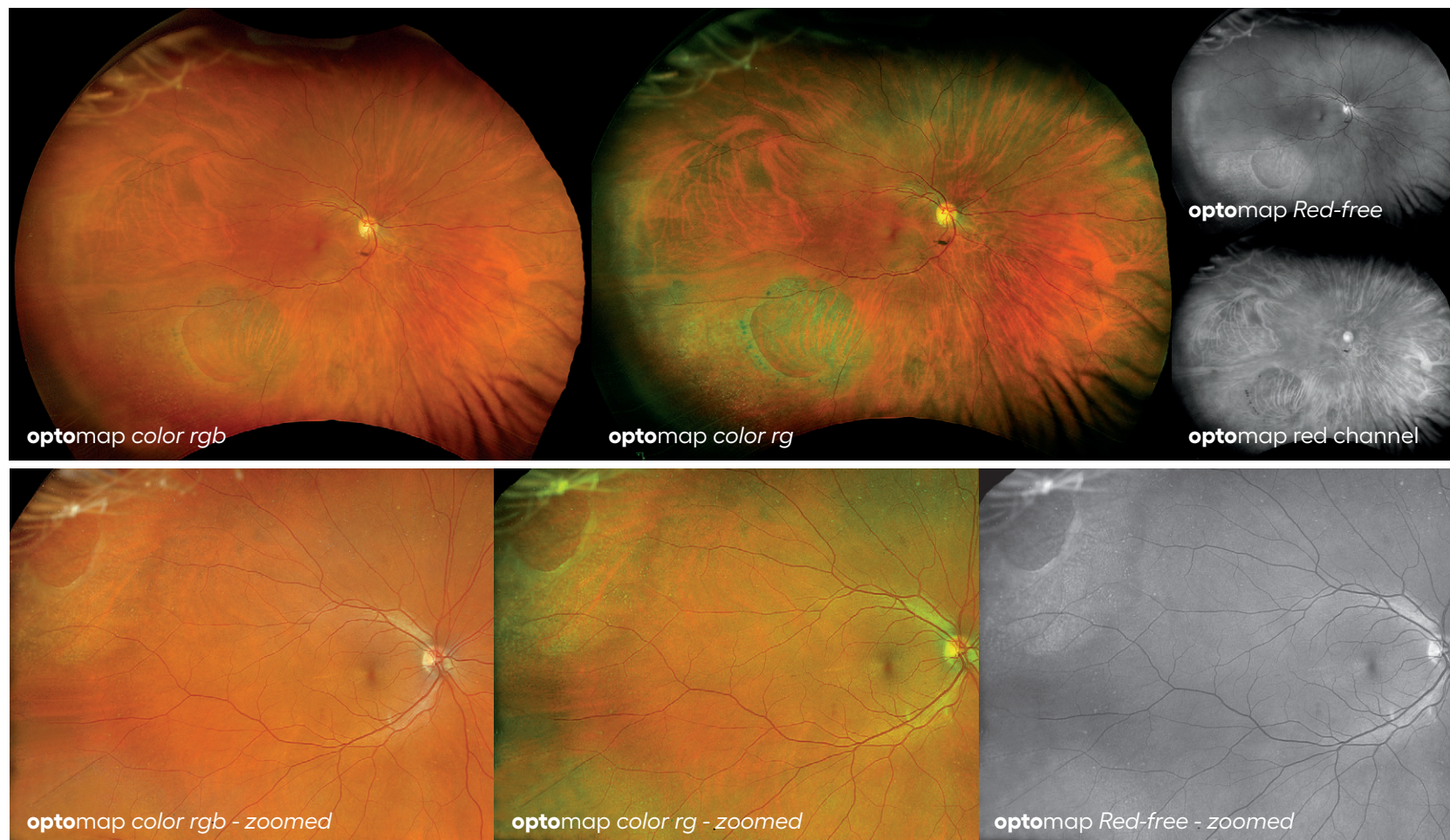
Retinoschisis

is a splitting of the sensory retina into an inner and outer layer due to vitreous traction that physically pulls the retina apart. The posterior border of a retinoschisis is convex appearing like blowing up a balloon. The inner layer can be shallow or bullous. The inner layer may have retinal vessels that can block the exiting light and produce a shadow effect.



Retinal Tears, Holes, Breaks

are small areas of the retina that are torn, or where holes may develop. These areas, called retinal breaks, can lead to retinal detachment. Retinal breaks are often caused by traction from the vitreous, the gel that fills the back of the eye. Traction can occur as the vitreous pulls away from the retina, which can occur with age, trauma, surgery, inflammation and near-sightedness.



Retinal Vein Occlusion (RVO)

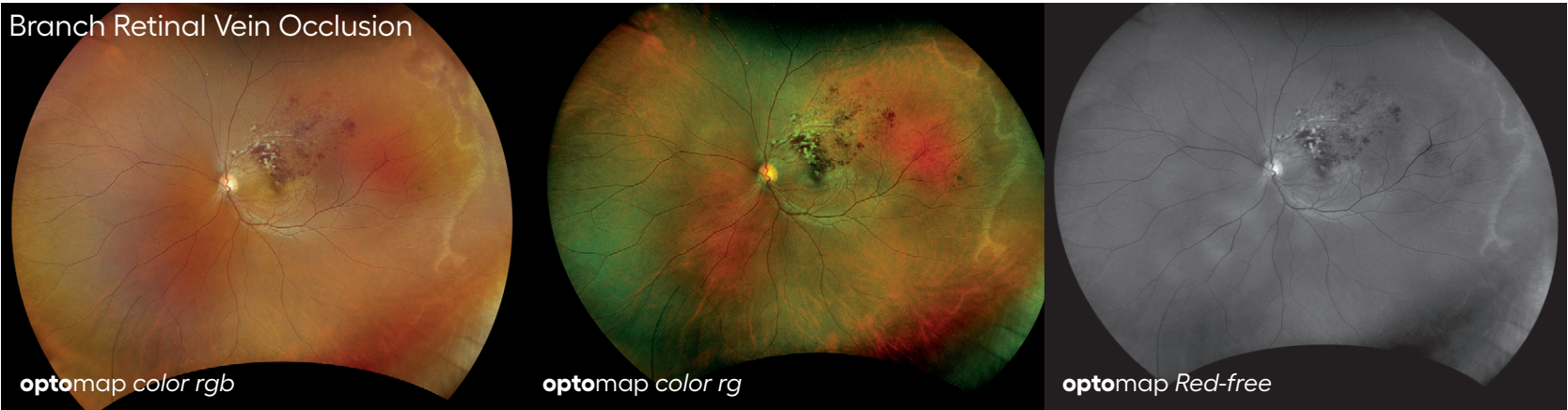
is a retinal vascular disorder in which a blockage occurs that can involve the central retinal vein (CRVO) or a major branch of the central vein (BRVO). These blockages occur where retinal arteries that have been thickened or hardened by atherosclerosis cross over and place pressure on a retinal vein. When a retinal vein is blocked, it cannot drain blood from the retina leading to widespread hemorrhages and leakage of fluid.



Branch Retinal Vein Occlusion



Branch Retinal Vein Occlusion



Central Retinal Artery Occlusion

is when an obstruction of retinal blood flow causes a lack of oxygen delivery to the retina resulting in severe vision loss in the area of ischemic retina.

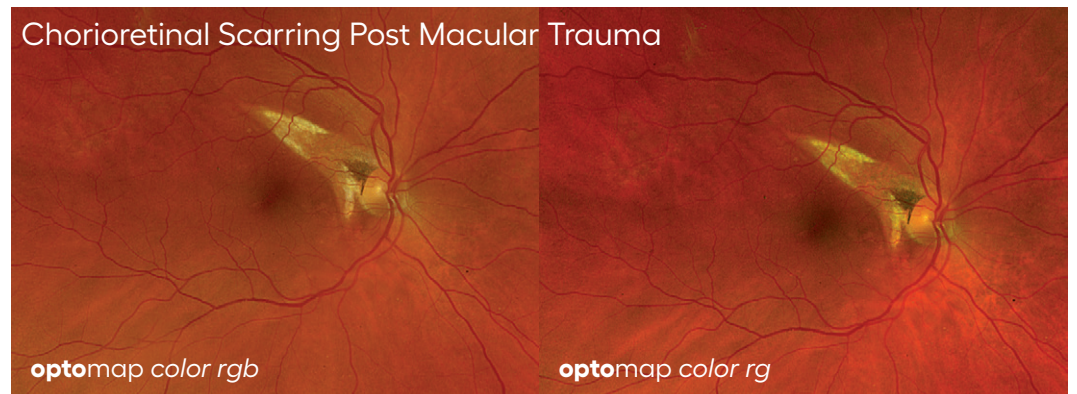
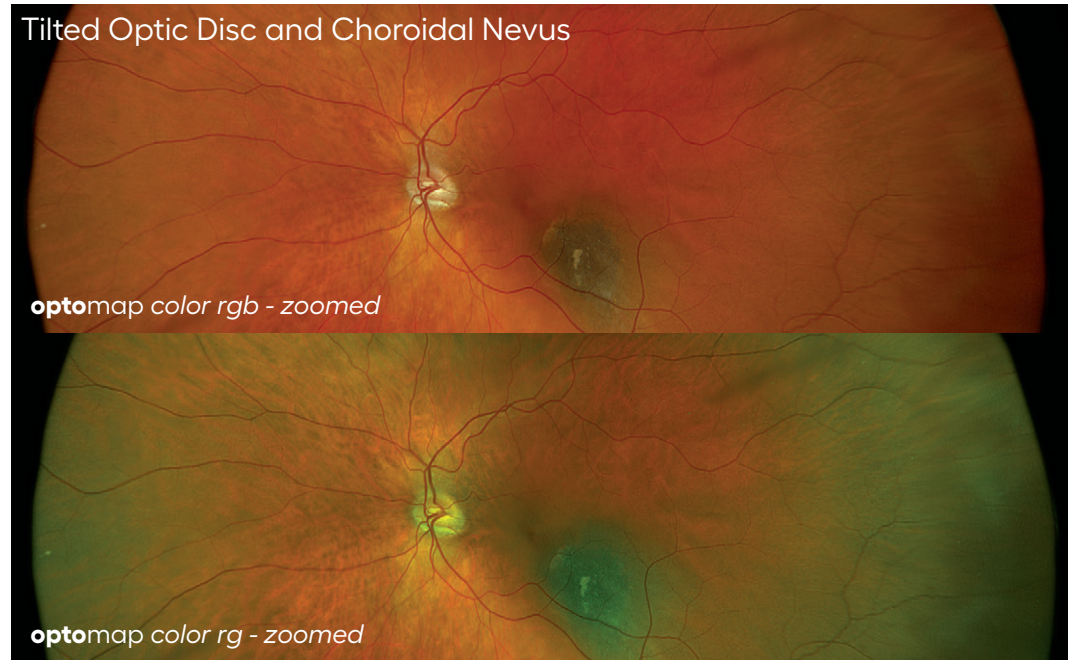
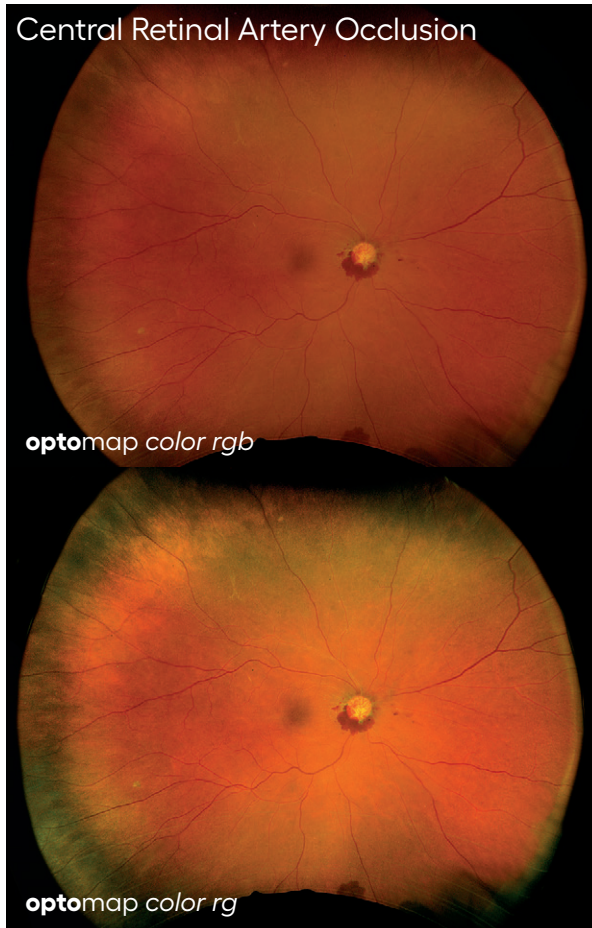


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Retina Rocks

Reference for Definitions

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Joel Schuman MD, Carmen Puliafito MD, James Fujimoto PhD
Slack Incorporated

The **optomap Diagnostic Atlas: A Retinal Reference Guide**
was created by the Optos Clinical Team.

Contact clinical@optos.com for additional educational questions

Optos is a leading provider of devices that enable eye care professionals to enhance their patient care. Our ultra-widefield (UWF) retinal imaging devices image 82% or 200° of the retina – in a **single capture** – something no other retinal imaging device is capable of doing. Now with 10 imaging modalities, Optos devices provide clinicians with clear, comprehensive views of the retina without needing to montage multiple images.

optomap images facilitate the early detection, management, and effective treatment of disorders and diseases evidenced in the retina. Additionally, **optomap** is the only clinically-validated ultra-widefield retinal image with **more than 2800 published studies incorporating optomap imaging for diagnosis, treatment planning, and patient engagement.**

Optos is committed to continue to deliver new products and software that support **optomap** as a standard of care, helping eye care professionals around the world save sight and save lives.



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