DIABETIC RETINOPATHY IN VIETNAM: CURRENT AND FUTURE DIAGNOSTICS AND TREATMENT

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Diabetes in Vietnam

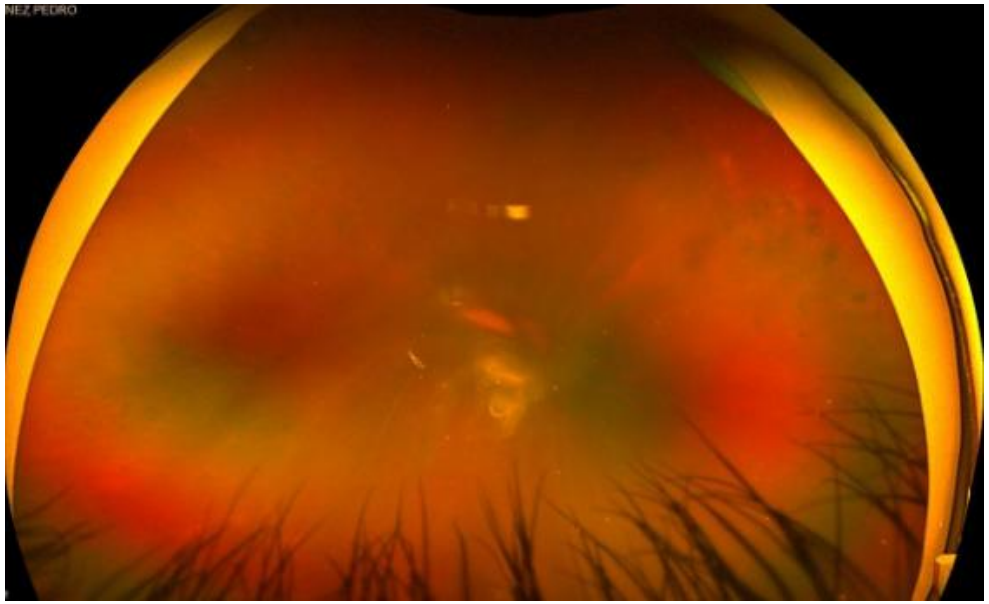
- An estimated 5-6 million Vietnamese people have diabetes, majority type 2
- The number of diabetics in Vietnam has doubled in the past decade
- More young people are getting diabetes due to a sedentary lifestyle with poor nutrition and subsequent obesity

Case Study

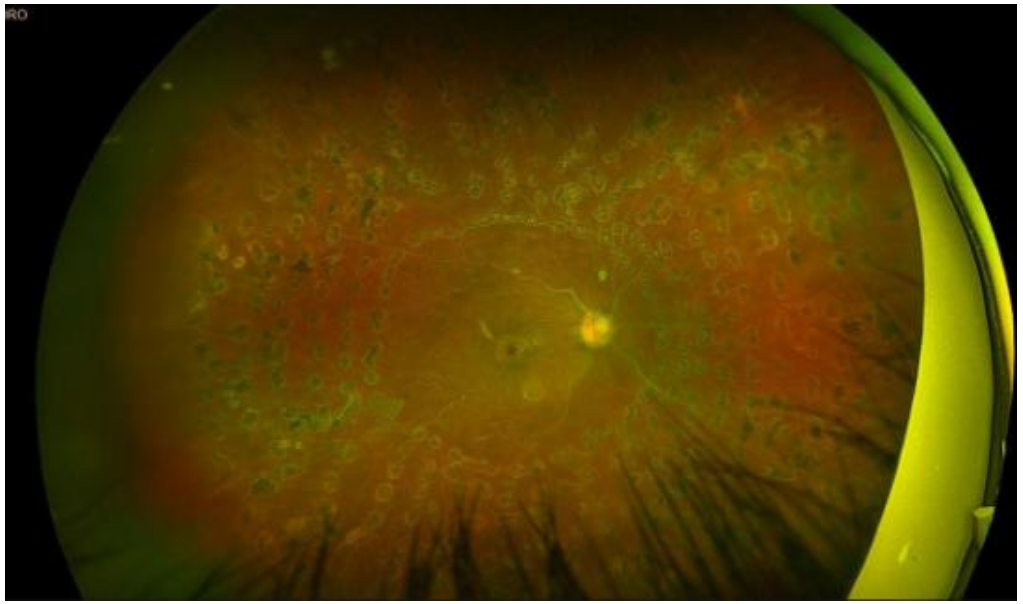
- 40-year-old woman with diabetes, diagnosed two years ago, presents with sudden loss of vision in the right eye
- Visual acuity is hand motion
- Developed a vitreous hemorrhage (VH) and traction detachment. Following vitrectomy, membrane peel, and laser, she had 20/50 vision

Case Study: VH Before and After Surgery

Before Surgery

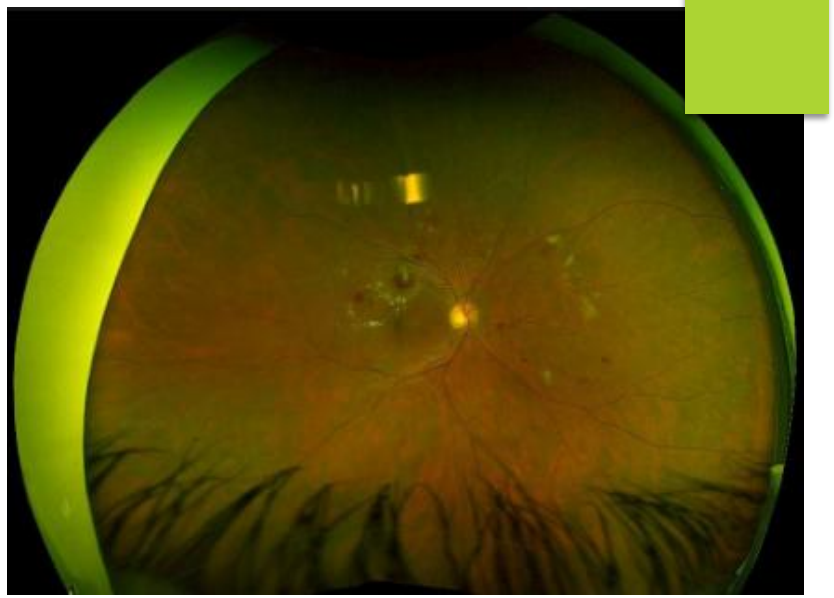


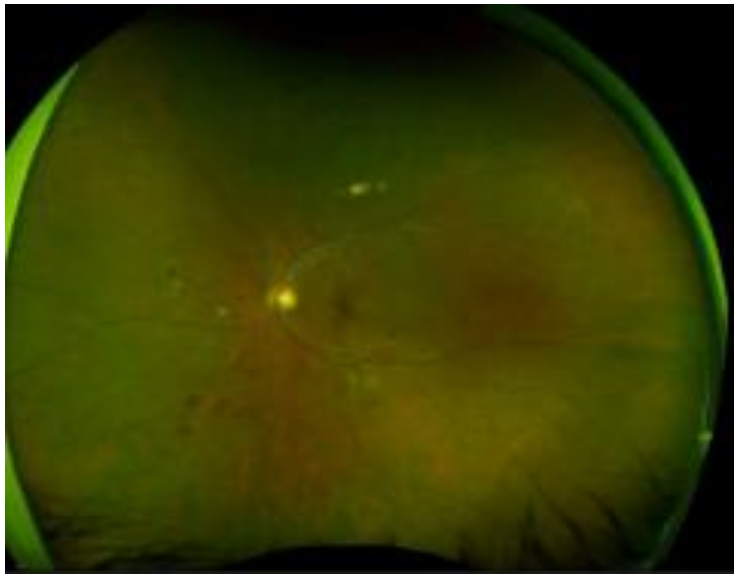
After Surgery



Categories of Diabetic Retinopathy (DR) - BDR

- Background Diabetic Retinopathy (BDR)
  - Characterized by microaneurysms, retinal hemorrhages, cotton wool spots and lipid
  - May result in macular edema and visual loss
- Overproduction of vascular endothelial growth factor (VEGF) causes leaky blood vessels, resulting in diabetic macular edema (DME)



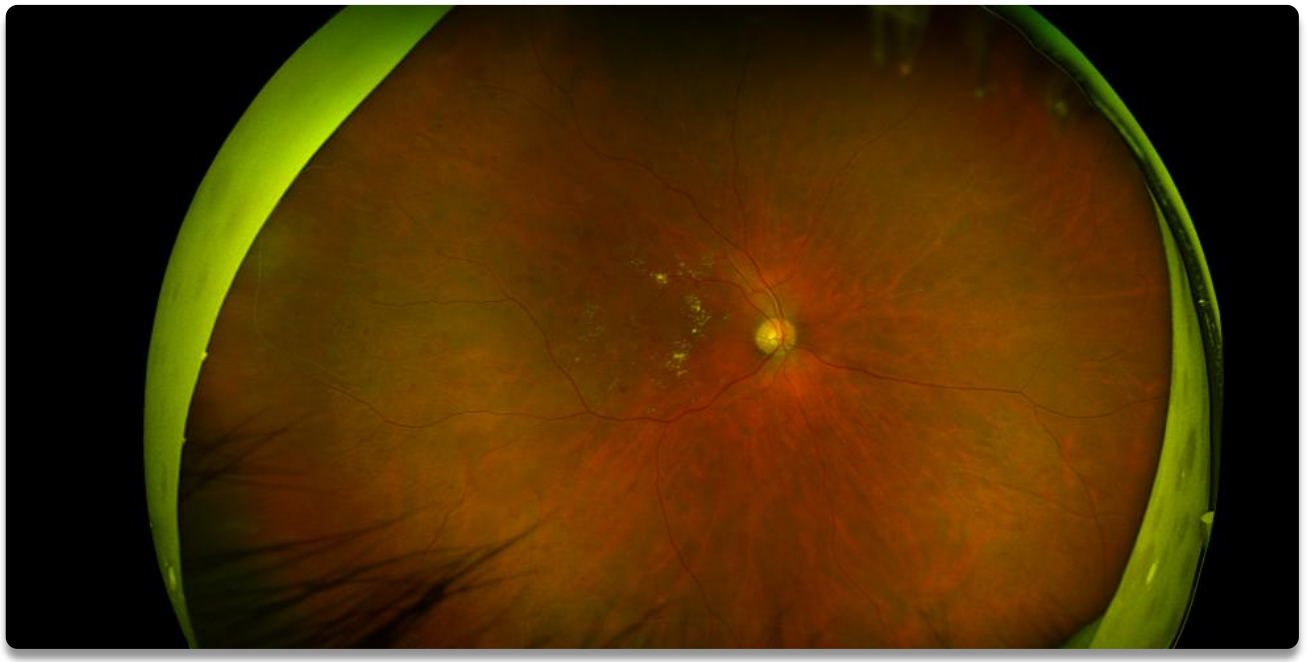


Categories of Diabetic Retinopathy (DR) - PDR

- Proliferative Diabetic Retinopathy (PDR) is caused by an over-production of VEGF leading to the development of neovascularization
- Neovascular membranes can leak causing vitreous hemorrhage, traction retinal detachment, and blindness

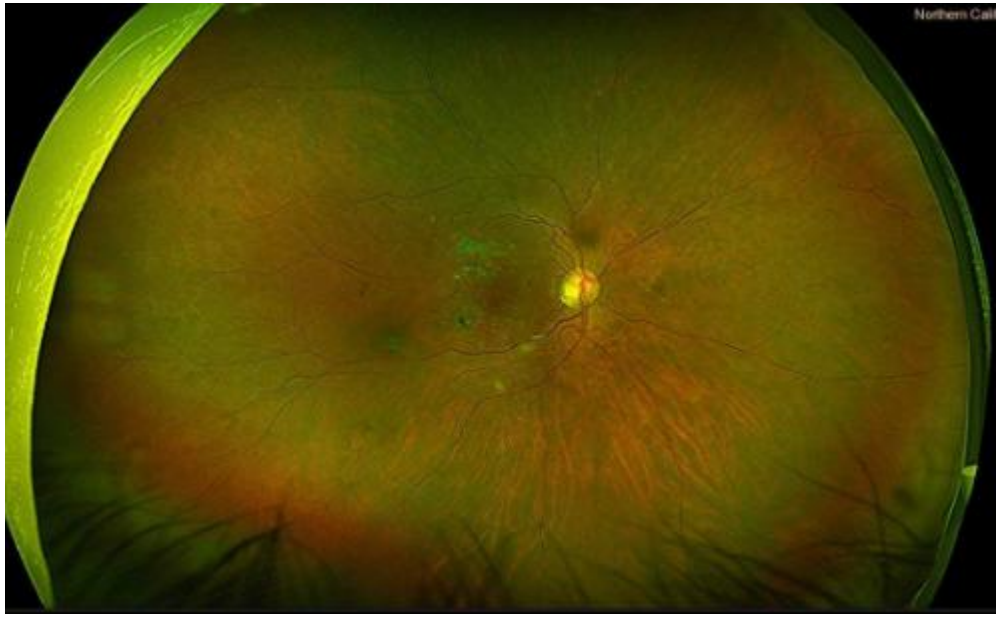
Pathophysiology of Macular Edema

- Endothelial cell tight junctions in the lumen of retinal vessels become compromised causing vascular leakage and macular edema



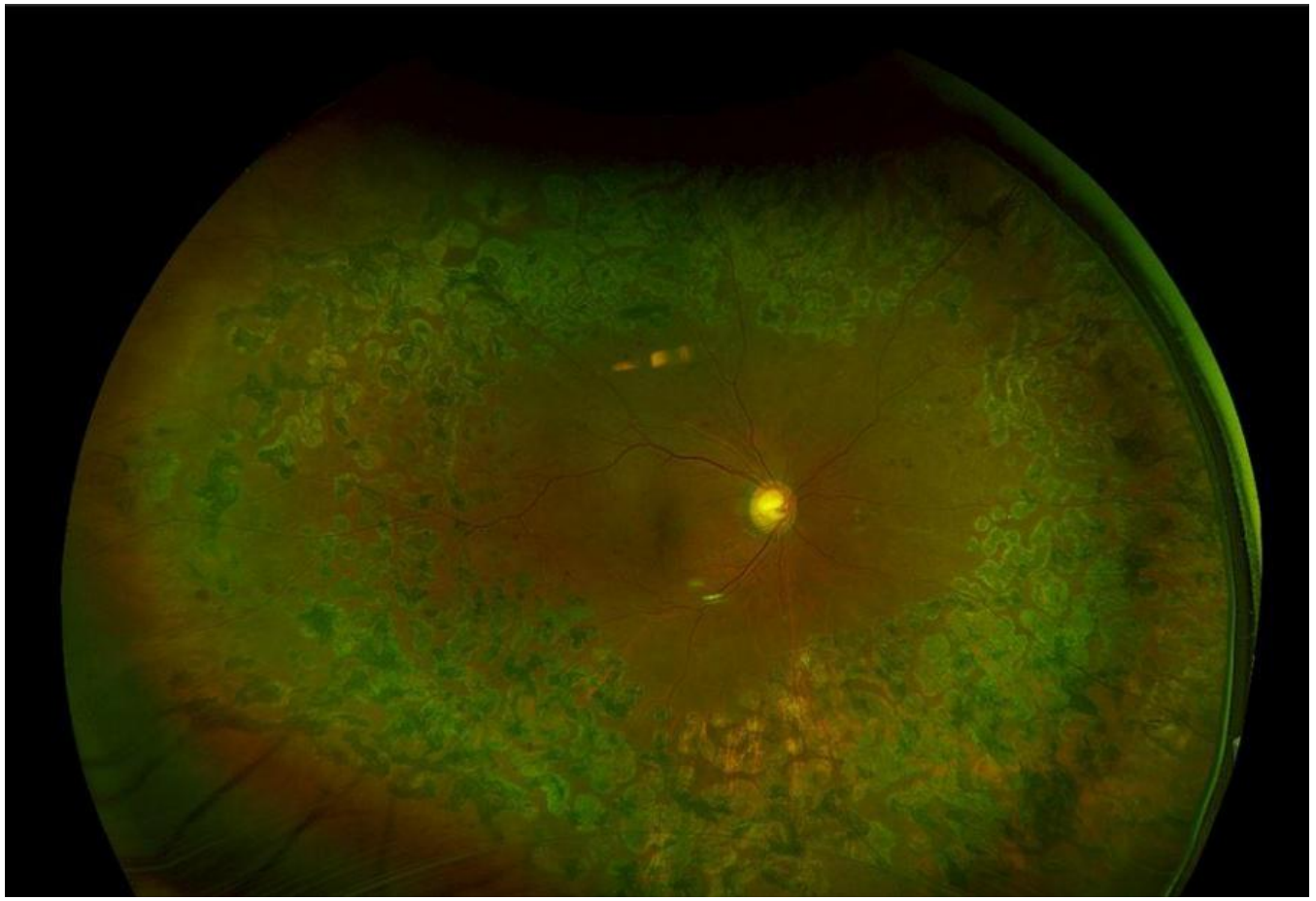
Laser Treatment for BDR

- Laser photocoagulation of the macula is used to seal leaky blood vessels (microaneurysms) and dry up macular edema frequently improving vision



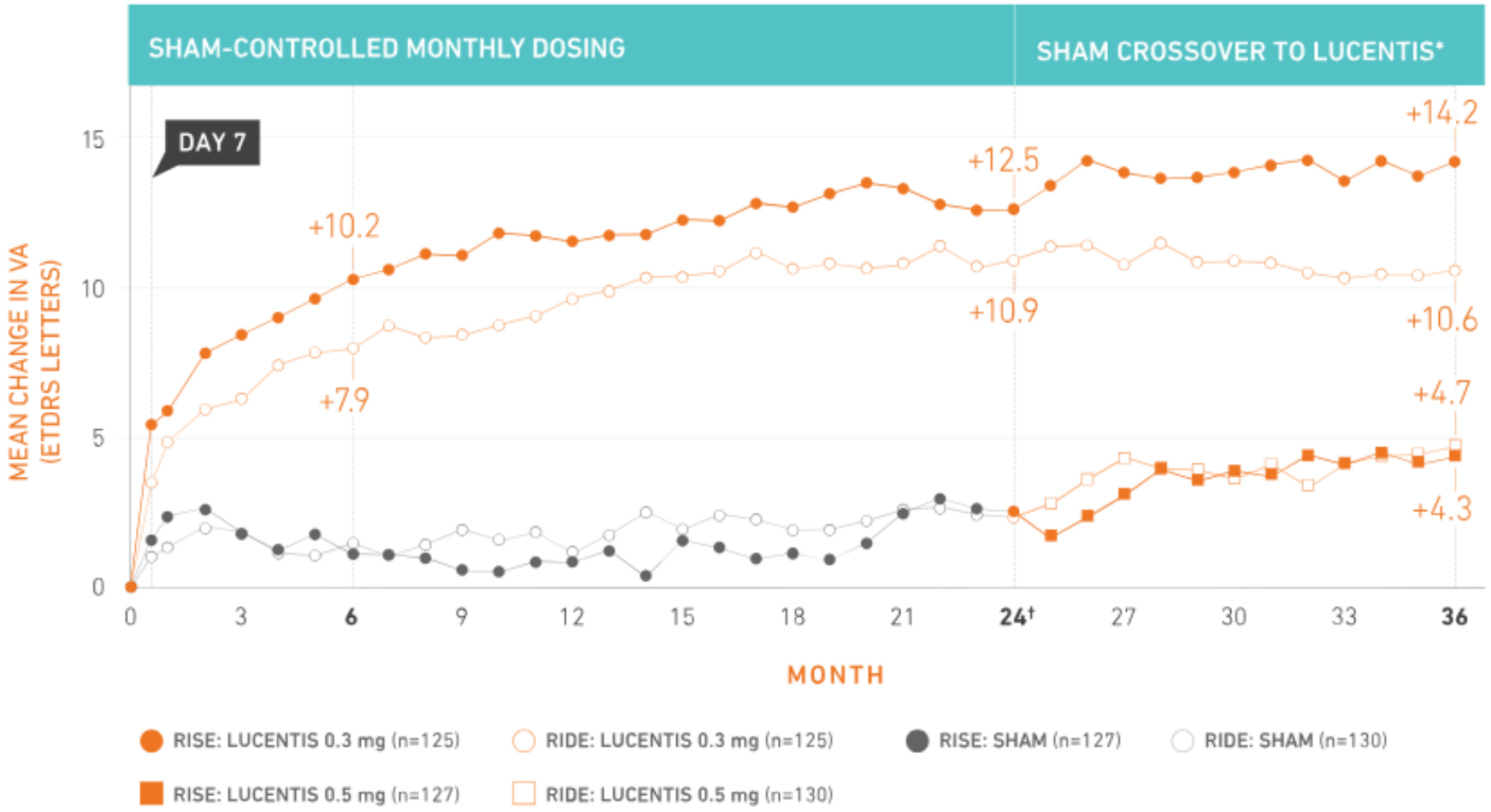
Laser Treatment for PDR

- Patients with PDR who undergo panretinal photocoagulation (PRP) may have resolution of neovascularization and clearing of vitreous hemorrhage, improving vision
- PRP attenuates production of VEGF



Treatment with Anti-VEGF Agents

- The discovery of vascular endothelial growth factor led to the development of the first FDA-approved anti-VEGF agent, Lucentis, for treatment of macular edema in 2006
  - Anti-VEGF treatments are performed via intravitreal injections (IVI)
- Many working-age diabetics were able to continue work as their vision stabilized or improved with regular intravitreal injections



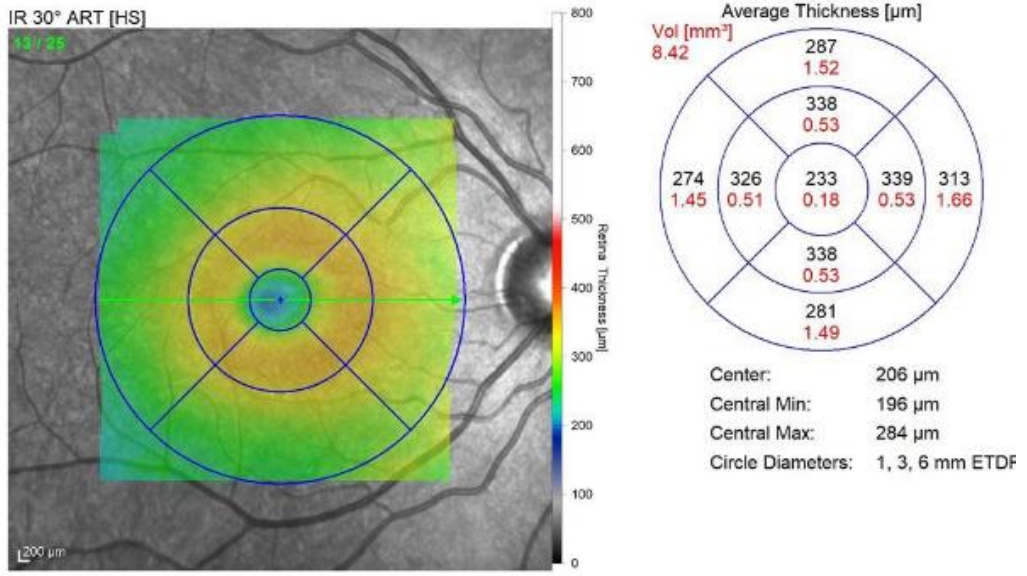
SOURCE: "Clinical Trial Efficacy & Results for DR & DME: Lucentis® (Ranibizumab)." *Lucentis*, 12 Dec. 2022

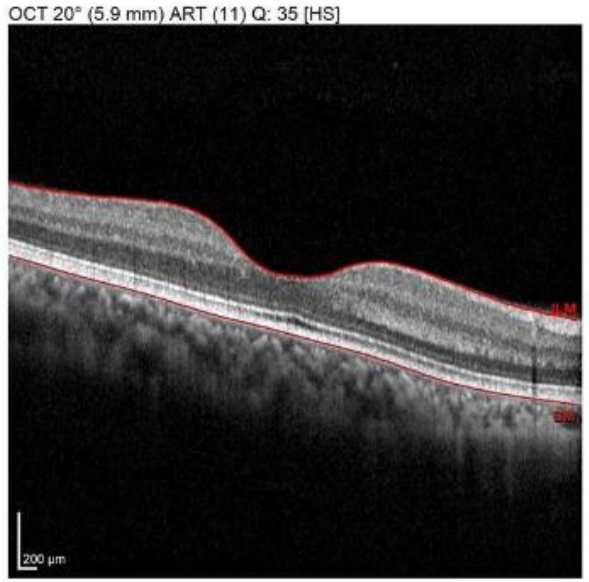
Anti-VEGF Agents

- Other anti-VEGF agents have subsequently been approved for DR including: Avastin, Eylea, Vabysmo, and steroids
- Regular monitoring and periodic anti-VEGF agents are needed to maintain visual acuity
- Patients with PDR may have a better response to a combination of both anti-VEGF and PRP
- Failure to treat promptly may result in vitreous hemorrhage, traction detachment, neovascular glaucoma, expensive surgery, and permanent visual loss

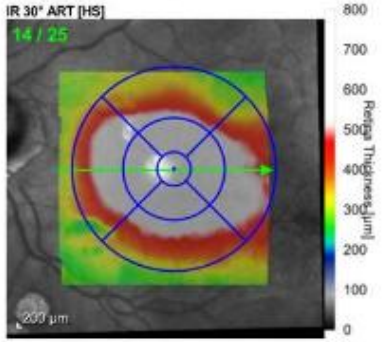
Imaging Diabetic Retinopathy – Optical Coherence Tomography (OCT)

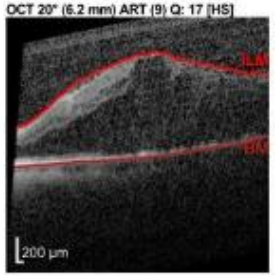
- OCT is a non-invasive imaging modality that uses light to measure retinal anatomy
- OCT is used to diagnose and follow response to therapy

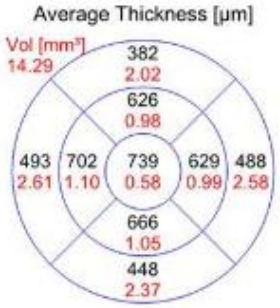




Follow-Up #4 **Apr/1/2025**

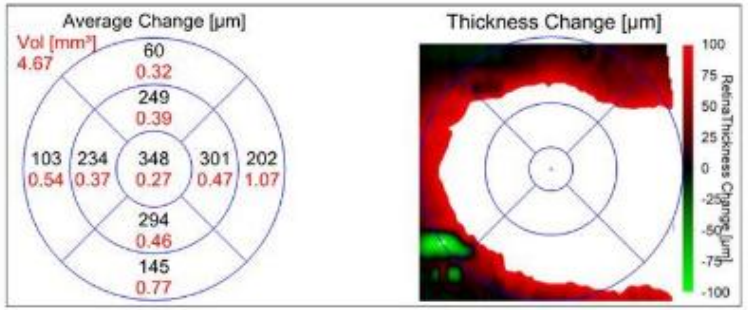




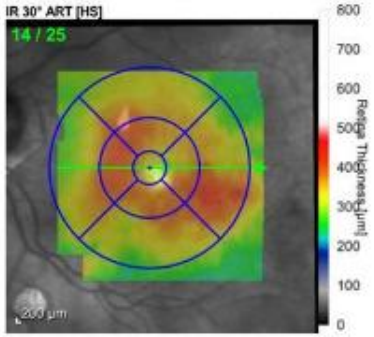


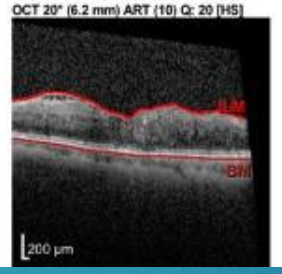
Center: 767 µm
Central Min: 665 µm
Central Max: 775 µm

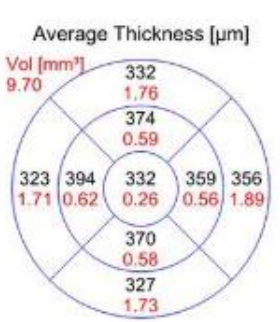
Circle Diameters:
1, 3, 6 mm ETDRS



Follow-Up #5 **May/13/2025**

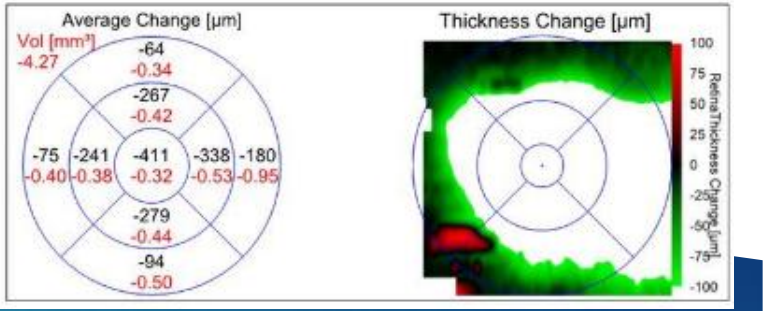




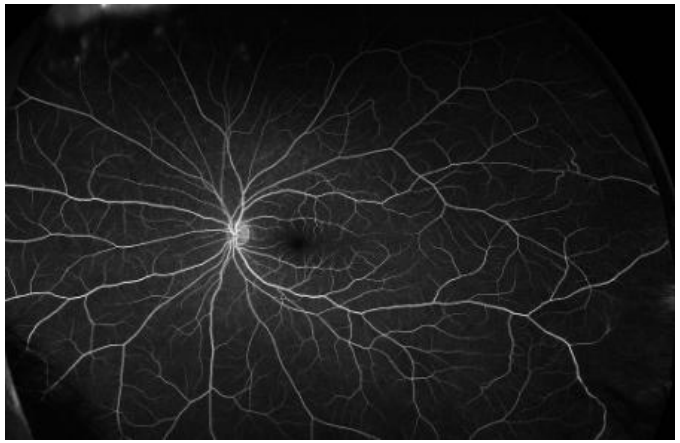


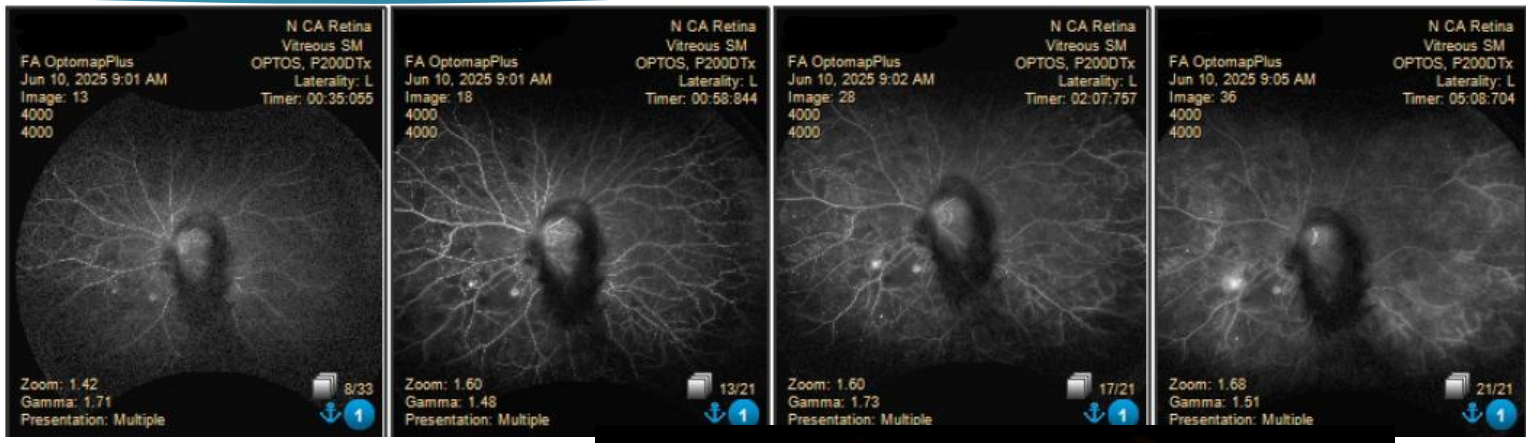
Center: 313 µm
Central Min: 279 µm
Central Max: 380 µm

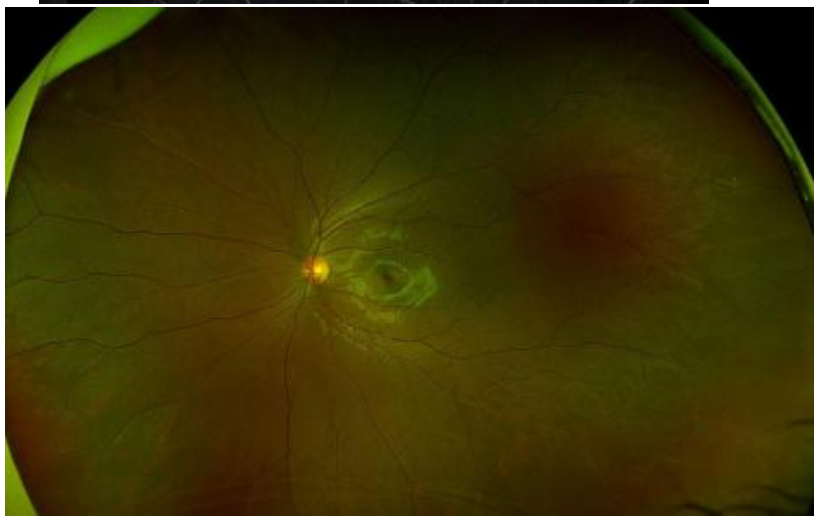
Circle Diameters:
1, 3, 6 mm ETDRS

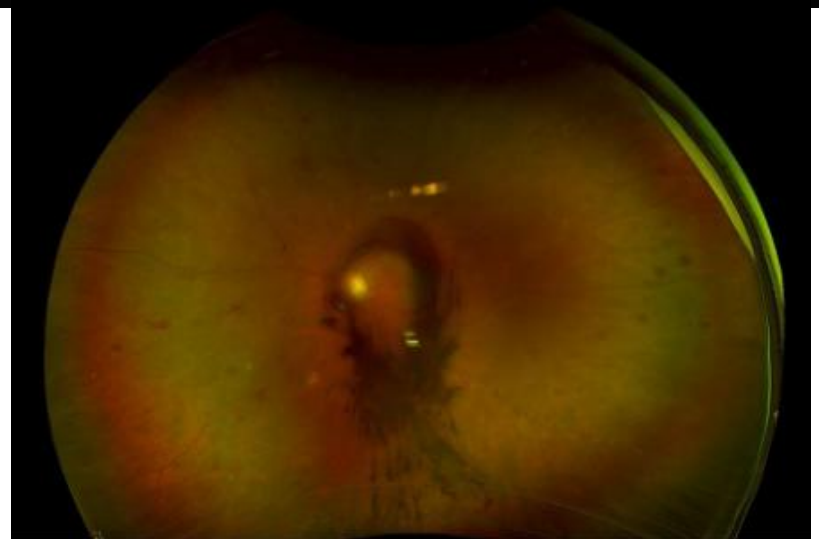


Imaging Diabetic Retinopathy – Fundus Photos and Fluorescein Angiography (FA)









Treatment

- Both anti-VEGF agents and laser photocoagulation have proven to be effective treatment modalities
- Patients with DME typically need regular intravitreal injections
- Patients with PDR regularly need both PRP and anti-VEGF agents
- Both of these treatment modalities frequently need to be repeated

Treatment Choice May Depend on Healthcare Access

- Patients in rural areas with limited access to monitored healthcare may be better candidates for laser photocoagulation
  - Laser is cheaper, readily accessible, and has good durability
- Patients who have access to modern healthcare facilities may have the ability to receive regular monitoring and frequent intravitreal injections

Periodic Anti-VEGF Injections for Macular Edema

- "Treat as needed" or PRN
- "Treat and extend"
  - Patients receive a series of three initial injections spaced one month apart, followed by an extended interval between subsequent treatments as determined by OCT
- Regular injections for chronic diabetic macular edema are crucial as DME remains a major cause of visual impairment in diabetics

Early Detection, Prompt Treatment

- The number one predictor of the prognosis of diabetic retinopathy is the duration of disease
  - Second is glycemic control
- Early treatment increases the likelihood of preserving vision
- Diabetic Eye Screening Programs (DESP) have been shown to decrease the risk of blindness in working age people in the UK

Diabetic Eye Screening Programs (DESP)

- ORBIS International has supported DESP
- Images are captured by trained nurses and technicians using digital color photos of the disc and macula taken from a tabletop non-mydriatic camera
- Training of ophthalmologists, optometrists, endocrinologists, general practioners, and nurses is critical for effective screening of diabetics

Country-Specific Strategies for Eye Screening

- Countries can adopt their own DR classification and appropriate referral pathways
- For example, photos can be used to classify:
  - No DR
  - Minimal observable DR
  - Treatable macular edema
  - Prolific diabetic retinopathy
- Screening also allows for an opportunity to discuss the importance of blood sugar control to reduce the risk of visual loss

Utilization of AI for DR Grading

- AI will likely improve successful DR grading, however reliable human grades are essential, especially in low resource (rural) areas

Current Areas of Research for Treatment of DR

- Drugs with better durability
- Drug delivery systems
- Combinations of therapy
- Gene therapy

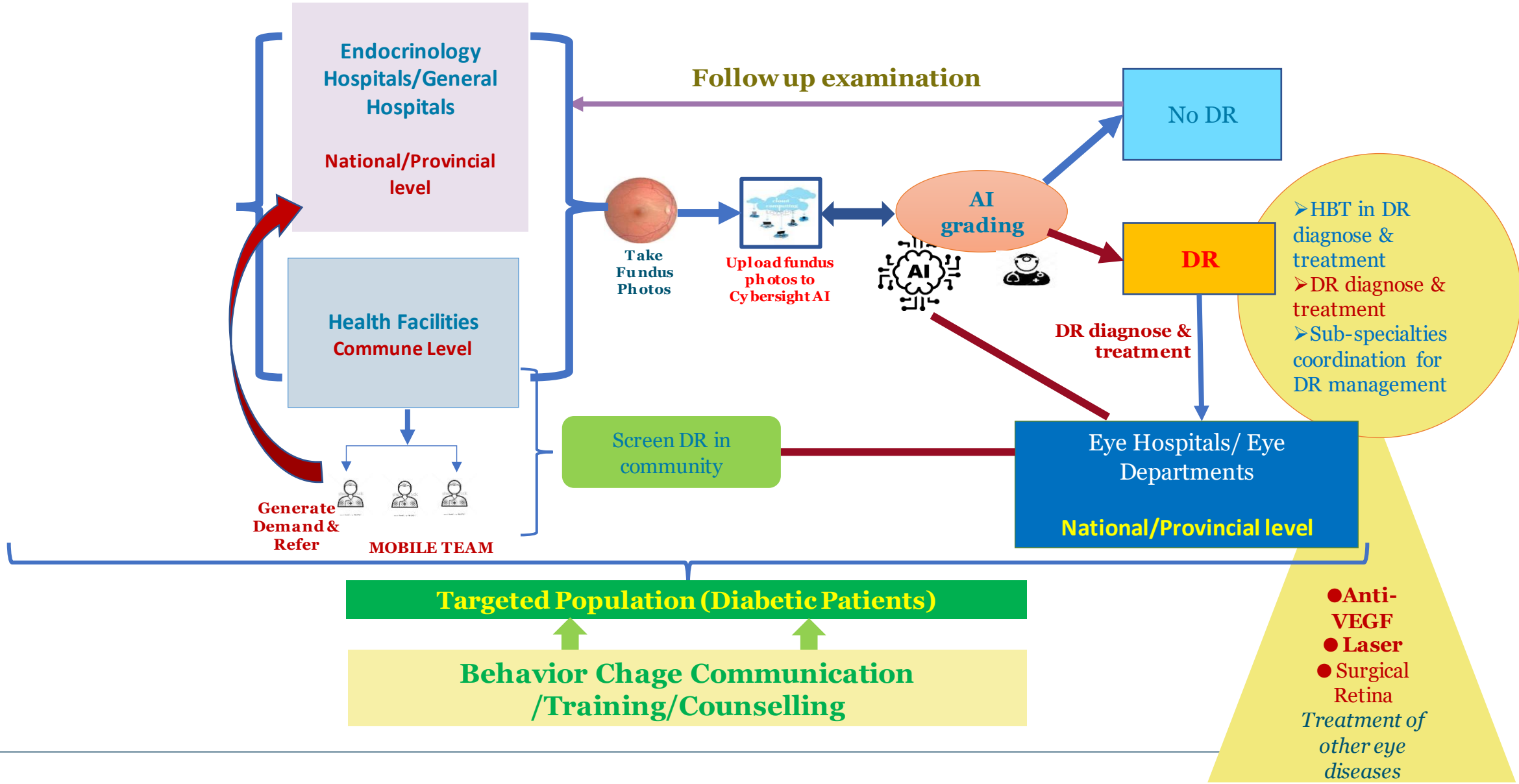
Cybersight

- Cybersight is a non-profit telemedicine and e-learning platform founded by ORBIS International to improve knowledge, skills, and expertise of eye health professionals
- Online access to international expert faculty
- Available in over 200 countries
- 155,000+ CME/CPD certificates awarded

Cybersight

- Free, live training events and courses, including surgical cases, requiring only an internet connection to access
  - Available in numerous languages
- Collaborate with a truly global community including ophthalmologists, optometrists, nurses, and technicians on diagnosis and treatment
- AI support tools that can detect diabetic retinopathy at no cost to users

EARLY DR DETECTION AND MANAGEMENT IN VIETNAM



Screened by Cybersight AI: 13.439
Refered by AI: 3.731 (27%)

KEY OUTPUTS AT 07 IMPLEMENTING PARTNERS IN NAM DINH, NGHE AN PROVINCES, CAN THO AND HANOI

- Fundus Photography **Trainings**
- Equipment **(Fundus Camera)**
- Continuous Technical Support (on-sites and telemedicine)

1st year of implementing the model (Jul 2024 – Jun-2025)	# cases of fundus photos	# cases graded by Cynersight AI
Can Tho General Hospital	1.986	1.864
Can Tho Cardiovascular Hospital	2.629	1.812
Tay Bac Nghe An General Hospital	3.495	2.748
Nghe An Endocrinology Hospital	**3.870**	**3.287**
Nam Dinh General Hospital	2.308	2.080
Giao Thuy Health Center	403	319
National Endocrinology Hospital – Unit 1 *(May & Jun 2025)*	***1.006***	***1.006***
National Endocrinology Hospital – Unit 2 *(May & Jun 2025)*	***323***	***323***
TOTAL	**16.020**	**13.439**

THANK YOU