Smartphone-based Retinal Imager for Self-Monitoring of Diabetic Retinopathy

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Diabetic Retinopathy

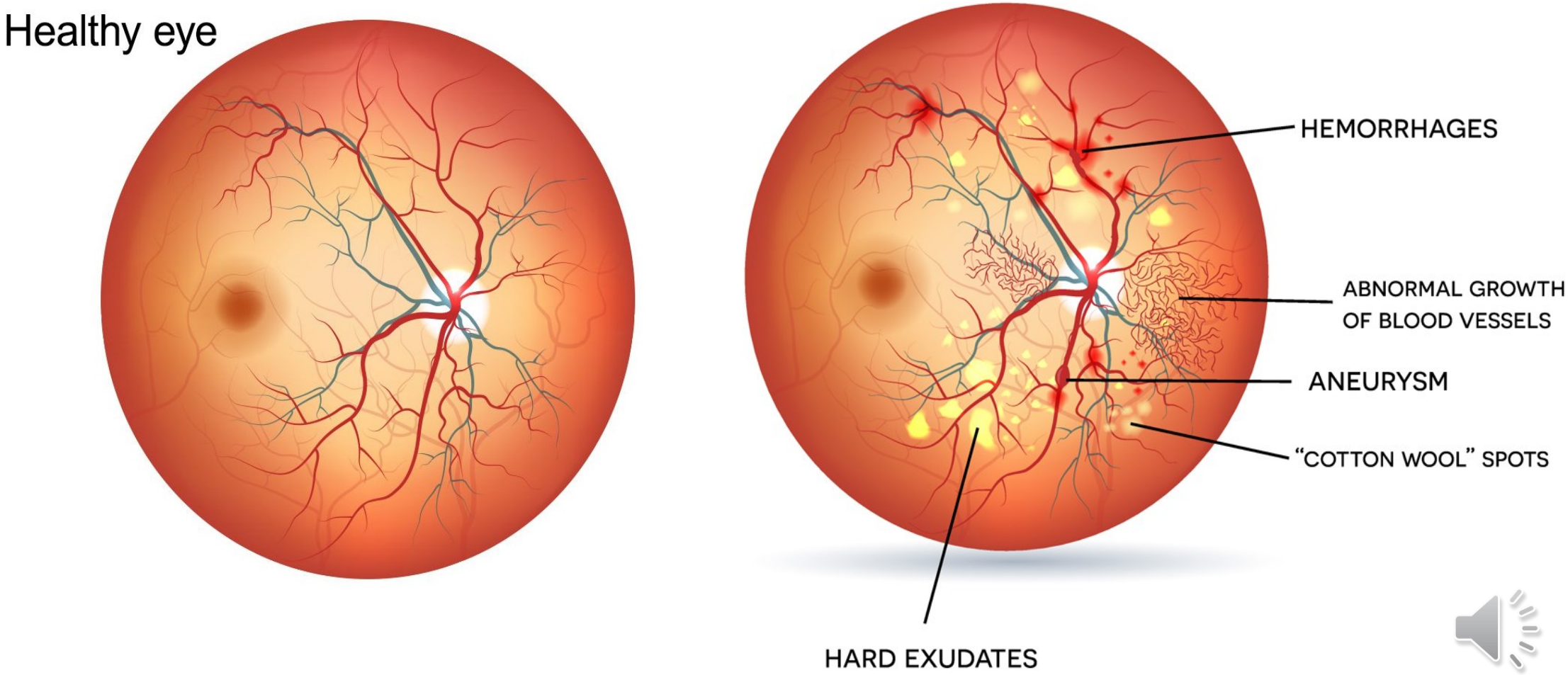


Fig 1. Healthy Retina (left) and Retina with Diabetic Retinopathy (right). Adapted from Diabetic retinopathy stock illustration by TefiM, 2017, iStock. Retrieved from https://www.istockphoto.com/vector/diabetic-retinopathy-gm653408680-118803049.

Screening

Compliance is LOW

Bulky

&

Expensive

Fig 2. Screening for Diabetic Retinopathy using a fundus camera. Adapted from Retinal exam stock photo by propeller, 2014, iStock. Retrieved from https://www.istockphoto.com/photo/retinal-exam-gm513445279-47247118?phrase=fundus+camera.

Fig 4. Peek Vision Smartphone-based retinal Imager

Fig 5. Nun+ Smartphone-based retinal Imager

Fig 6. Nun+ being used to take a Retinal Image, requires an operator.

Aim

Create a **novel smartphone-based retinal imager** specifically for **self-imaging.**

Fig 7. Retinal Image of Diabetic Retinopathy. Adapted from Retina of diabetic - diabetic retinophaty stock photo by memorisz, 2014, iStock. Retrieved from https://www.istockphoto.com/photo/retina-of-diabetic-diabetic-retinophaty-gm509686269-45975672?phrase=diabetic+retinopathy&searchscope=image%2Cfilm.

Fig 8. Self-Operated Retina Imager being used by the subject.

Fig 9. Self-Operated Retina Imager using a Motorola G50.

Without illumination

With illumination

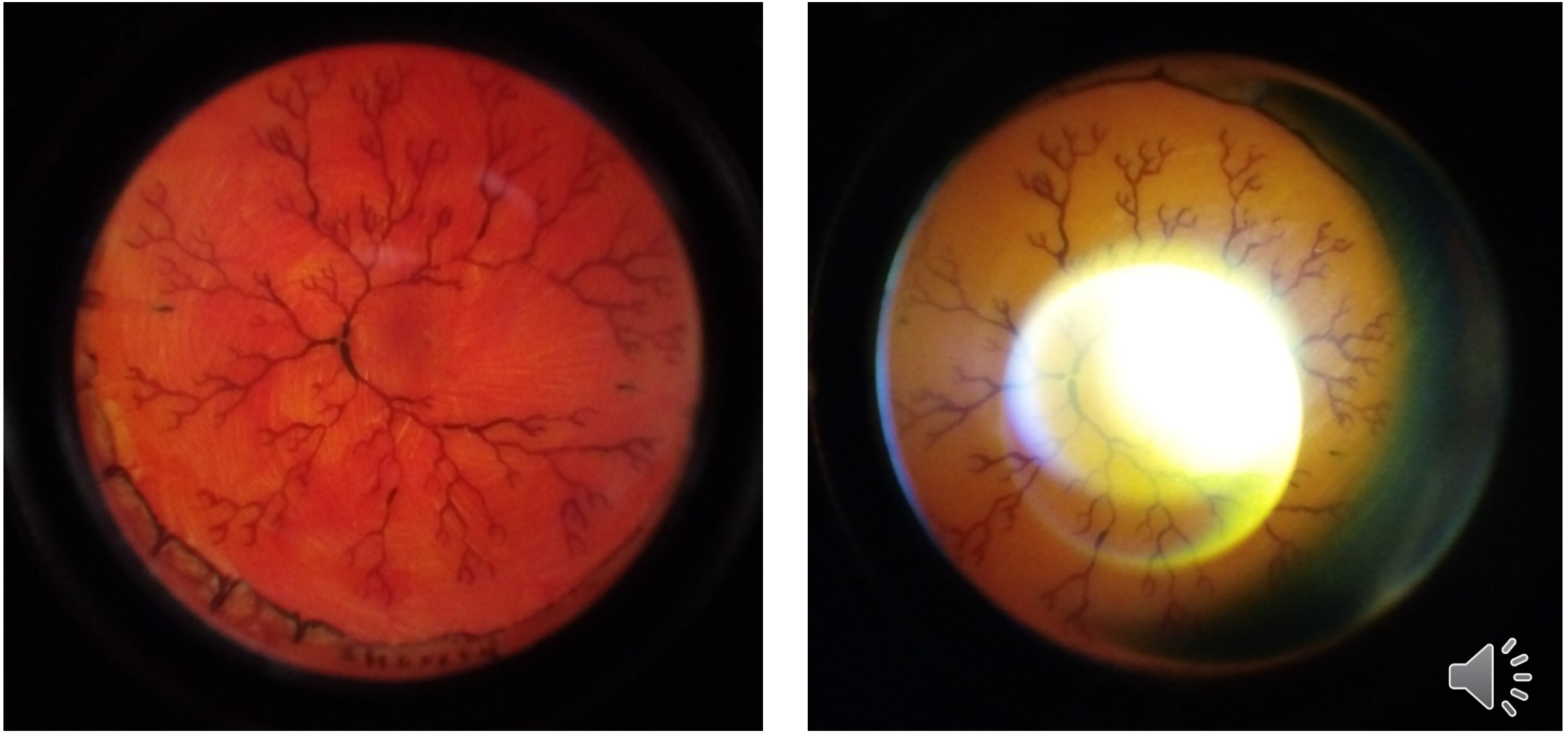
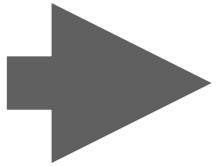
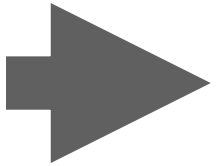


Fig 10. Images taken with the self-operated retinal imager on a translucent eye phantom A) without the illumination system B) with the illumination system

Self-Operated, Retinal Imaging



Increase Rate of Diabetic Retinopathy Screening



Decrease the Risk of Irreversible Blindness

RETINASCOPE

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