

# Tele-medicine for ROP

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# Introduction

- Despite the availability of good treatment, babies continue to go blind from ROP
- In large part because they have not been screened in a timely manner
- One of the main reasons is that not enough physicians are available
- The number of adequately trained ophthalmologists able or willing to perform in-person exams is limited.

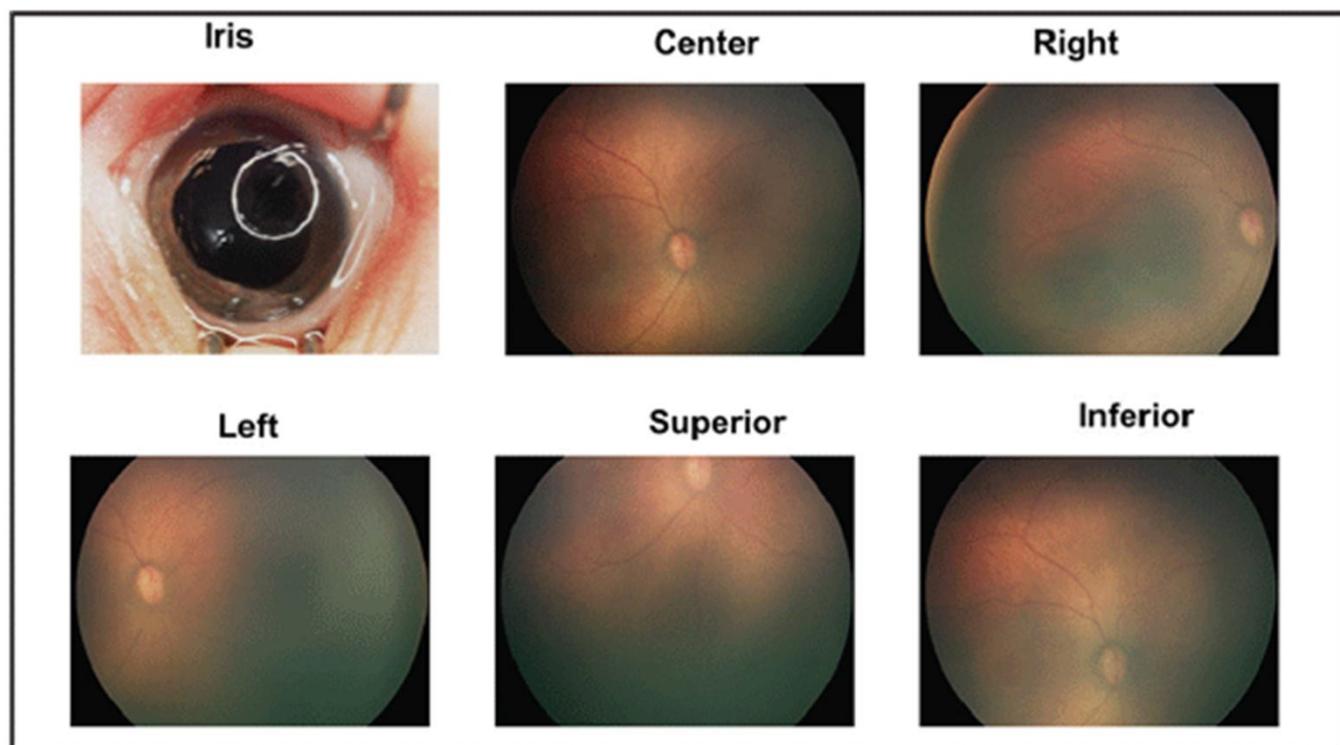
# Introduction

- An emerging technology, store-and-forward telemedicine involves capturing medical data to be interpreted by a remote expert.
- With better Internet access, a commercially available portable wide-angle digital retinal camera, and a dozen or so studies suggesting success in infants, telemedicine seems poised to play a larger role in the screening of ROP.



# SUNDRÖP

- Stanford University Network for Diagnosis of Retinopathy of Prematurity (SUNDRÖP)
- One of the longest-running telemedicine programs in the US
- “With eight years of data from about 4,000 babies, they have identified—100 percent of the time— all retinopathy that requires treatment. They have lost no babies to blindness.”



**Figure 3. Protocol photographs, right eye. An external iris shot, and then five fundus shots with the nerve centered, right, left, superior and inferior.**

# E-ROP

- Includes 12 clinics in the US and one in Canada
- Trained nonphysician ROP imagers use standard protocols to capture five retinal images in each eye
- Upload them for remote evaluation by trained nonphysician readers
- Non-physician image readers identified RW-ROP in all but three infants (98%).

# Plus disease

- Telemedicine may be particularly helpful in diagnosing plus disease, one of the criteria for type 1 ROP, which warrants treatment.
- Identifying the tortuous and dilated vessels that define plus disease is subjective.
- if you're relying on BIO, it has to be simply 'trust me.' Whereas, I can support my position with images."
- . It helps to see changes over time. Is it the same or different?

# Cameras

- RetCam: a digital fiberoptic wide-angle fundus camera with a 130-degree view.
- Able to image all of zones I and II in any baby's eye



# Cameras

- The Pictor<sup>®</sup>: a handheld noncontact fundus camera
- Despite its 45° field of view, was found to have 100% sensitivity by both graders when compared with clinical examinations.
- At ~\$10,000, the Pictor may make implementation of telemedicine ROP screening programs more widely accessible



# Meeting Resource Demands

- The most obvious application of telemedicine for ROP is in:
  - Overcoming geographical challenges
  - Shortages of resources.

# Geographic limitations

- Telemedicine is a special boon to premature babies in remote rural areas or developing countries.
- A well-trained technician takes the RetCam, carried in the back of an SUV, to the babies who need screening, and the ophthalmologist reviews the images on his iPhone.

# More efficient use of resources

- Fewer than 10 percent of babies who are screened end up needing treatment.
- Serial exams of those babies snowball, and you have a huge manpower expenditure to detect a small number of babies needing treatment.

# Other Benefits

- Easier on the baby
- Helps educate parents
- Allows closer scrutiny
- Objective documentation

# Conclusion

- The point of telemedicine is not to replace doctors with machines
- Doctors are still responsible for managing the disease, but they are doing it remotely and with fewer in-person exams.

Thank You