

Tele-Ophthalmology – Narayana Nethralaya Experience

- **Retinopathy of Prematurity**
- **Largest cause of infant blindness in developed countries**
- **India is suffering from the “Third Epidemic”**



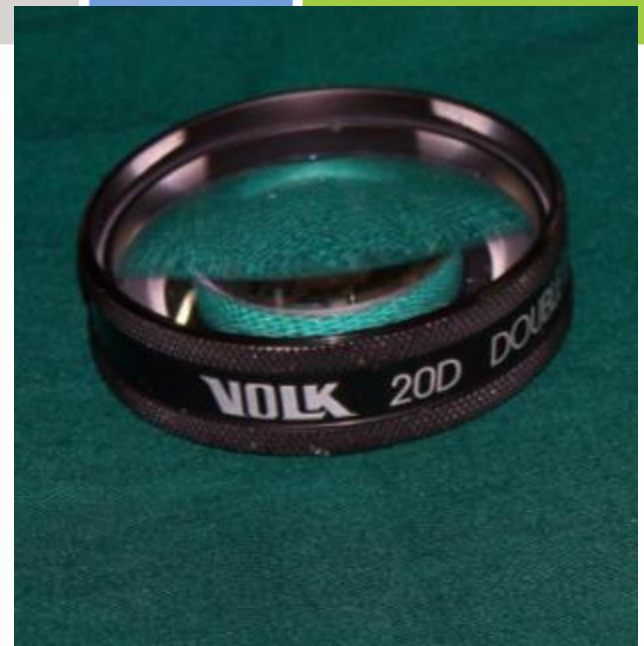
Tele-Ophthalmology – Narayana Nethralaya Experience

- **Affects Preterm & Low Birth Babies (< 2000 g)**
- 47% of Infants (< 1750) suffer from “some ROP”
- 15% of these will turn BLIND if not treated





The Initiative



Narayana Nethralaya Initiative



Triple T Strategy

- Tele- ROP
- Train peripheral ophthalmologists (ROP fellowship)
- Talking to and Training pediatricians & gynecologists



Narayana Nethralaya
KIDROP Trial
 (Karnataka Internet Assisted
 Diagnosis of **ROP**)
 2007 to date

KARNATAKA - PILOT PROJECT

- **Phase 1:**
Level 3 NICUs in Karnataka
- **Phase 2:**
Level 2 NICUs (of Ph 1 areas)
- **Phase 3:**
Level 2 NICUs (of areas not in Ph 1 & 2)





Transporting Equipment to the Periphery



Districts Covered Thus Far



Day	District	Distance (Kms)
Mon	Mandya, Mysore, Chamrajnagar	320
Tue	Bangalore BBMP	50
Wed	Tumkur dist Hosur (TN)	220, 80
Thu	Kolar	152
Fri	Tumkur Pavagada	141
Sat	Bangalore Urban	68
Sun	-	-

Ophthalmic
Camera

PATIENT SITE



Upload

Ophthalmic
TelePACS
Server



Progressive
Viewing

Ophthalmic
Worklist & Viewer

Remote
Viewing

ANY SITE

ANYWHERE



- Studies captured by digital Fundus camera
- Uploader installed on Fundus camera workstation
- Uploader encrypts, compresses losslessly and transmits Studies to Server over LAN or WAN

- Stores Studies for download.
- Provides user services over the WEB such as:
 - Viewer download
 - Worklist creation
 - Workflow management.
 - Admin functions
 - User authentication

- Remote Ophthalmologist logs-in at the Server over WEB.
- Downloads viewer one time from server.
- Downloads worklist from server.
- Selects studies to download from the worklist.
- Downloads studies realtime and progressively views
- Uses Viewer tools to analyze images.

- Creates reports via WEB reporting feature or Word upload.
- Electronically signs and sends to Patient Site or forwards to consultant.



iPhone Log-In Screenshots



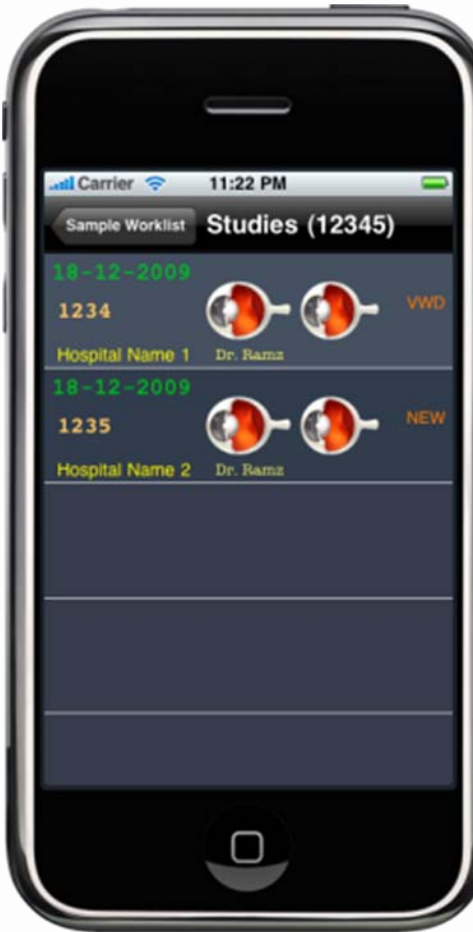
Your institution here

Home screen of hospital or clinic





List of studies for review



History of Visits for Particular Patient



Patient Information



iPhone Viewer Screenshots

6a



Patient Details

6b

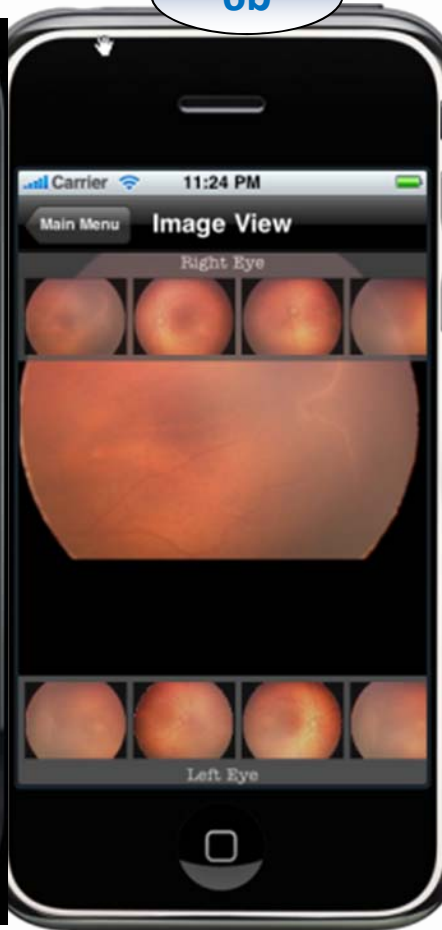
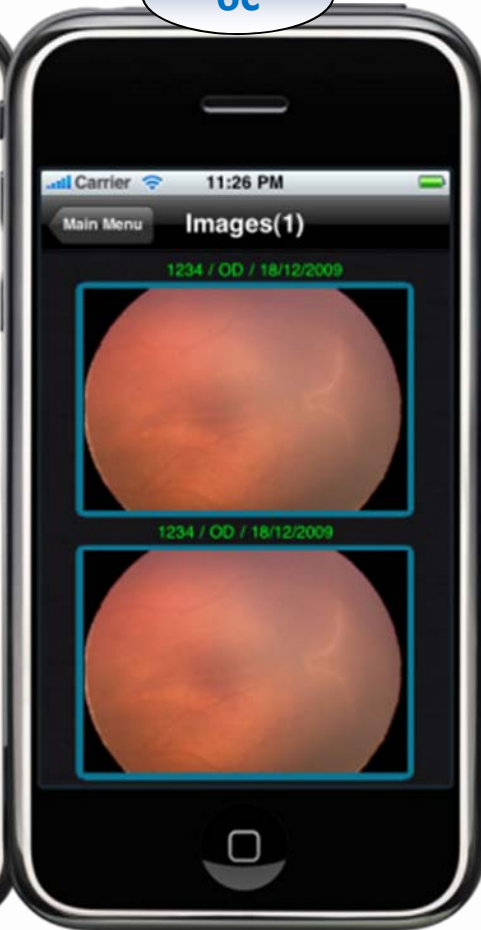


Image with
Thumbnails

6c



Compare
Images





iPhone Reporting

6e



ROP Reporting

6e



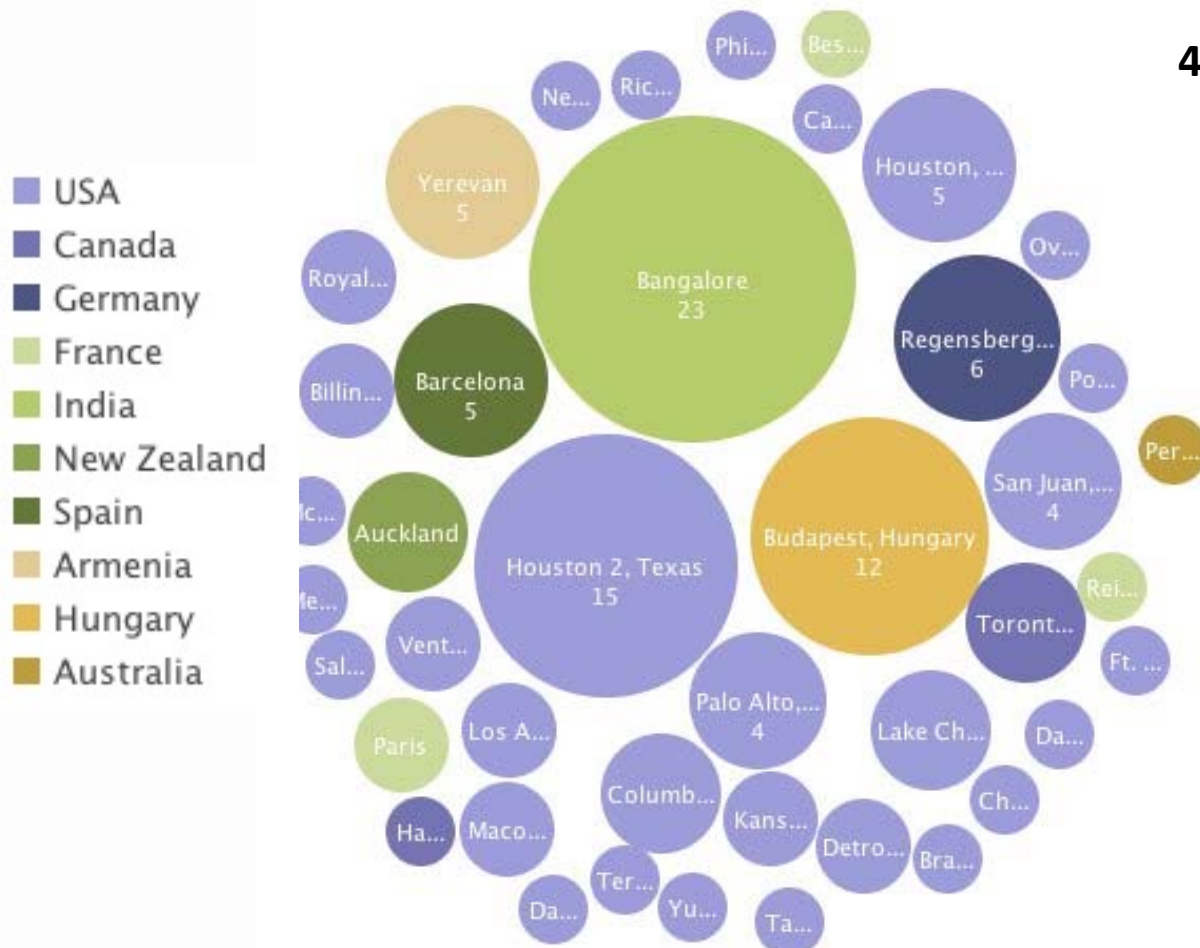
Final Report

How its worth it!! – The Indian Experience

- 3045 Infants screened so far: 323 treated
- **323 infants treated thus far will contribute :**
323 infants x Rs. 38,000 (per capita income) x 65
years (life expectancy) = Rs. 797810000
- **Approx USD 17.7 million**
- **Investment USD 0.4 million**

Worldwide ROP Telemedicine – 2010

Slide Courtesy : Clarity MSI, CA, USA



42 known networks

Approximately 129 sites

30 Networks in USA
(65 sites)

9 networks International

Longest running network
6 years (Germany)

**Largest program-most
hospitals (Bangalore, India)**

Bubble size indicates size of network



First PPP in Infant Blindness in India - ROP

2.3 Crores (2009-2012)

Innovative Initiative by Govt. of Karnataka