Taking subspecialty pediatric eye care to the community – The Narayana Nethralaya model

With the decreasing burden of cataract blindness in rural areas after successful integration of public, private, and non-governmental organizations, the need for providing subspecialty care "outside cataract" is the need of the hour. Although glaucoma and diabetic retinopathy have captured the center-stage in recent times, pediatric eye disease management in rural India remains underserved and unmet need is still staggering. The Government of India 2014 census reported that approximately 8.9%, 9.0%, and 9.7% of the Indian population were between the age groups of 0–4, 5–9, and 10–14 years, respectively.[1] This accounts for over 300 million children or 27.6% of our population. Evidently, the "pediatric burden" is larger than we expected and with it, probably, an underreported prevalence of pediatric eye disorders.

At Narayana Nethralaya, we have focused on pediatric eye diseases and retinopathy of prematurity (ROP) since over a decade. Our flagship program has been the tele-ROP model, "Karnataka Internet Assisted Diagnosis for Retinopathy of Prematurity (KIDROP)", which was the country's first outreach model using an image-based telemedicine platform to screen (and treat) preterm infants with ROP in semi-urban and rural regions of Karnataka state. At the time of this publication, over 2500 infants have been treated from 127 neonatal units in 30 districts. This has resulted from over 150,000 screening sessions performed by dedicated "non-physician" teams covering the state in five zones.[2,3]

The Pavagada Pediatric Eye Disease study (PPEDS) is a large community-based door-to-door screening program of over 30,000 children from one of the most underserved and impoverished talukas of the state.[4,5] The impact was not just measurable in the blindness prevented and treated but also the paradigm shift in promoting health-seeking behavior, community participation, and social reforms that resulted as a consequence. Our other programs include the "Slum 10K", wherein 10,000 urban children from the lower socioeconomic strata were screened and treated. Our vision rehabilitation service strives to detect cortical vision impairment, developmental delay, and children with special needs in the outreach and provide them affordable and accessible integrated rehabilitative services.

The common thread for these programs were the guiding principles that we have cultivated. Firstly, we measured the "return on investment" in terms of the impact and not financial gains. For example, the blind person-years saved from the KIDROP program is currently over INR 600 crores.[6] The outcome of the vision rehabilitation department is to enumerate the number of children who would cross over from blind to normal schools.

Secondly, through cross-subsidy, we provided ROP screening and treatment at no cost to the families of babies born in government hospitals since the inception of the program. By creating a tiered payment system for private hospital patients, the ROP model is not only viable but scalable. Our ROP model which has been studied by the Indian Institute of Management (IIM), Ahmedabad and Bangalore, Harvard Business Review, and the Niti Aayog is declared as a good practice not only for India but other middle-income countries with similar demographics.[7] Several states are emulating the KIDROP model under our mentorship.

Thirdly, through the principle of "task-shifting" by employing "locals" we have been able to create a sustainable human resource work-force that is motivated not only to continue to serve their districts but also expand and scale-up operations at lower costs. We have also partnered with the government in public-private partnerships, which have resulted in a successful and replicable framework of public healthcare delivery.

Fourthly, the principle of "affordable innovation". An indigenous ROP camera developed with the help of an industry partner (Forus Health, India), and the Indian Institute of Technology (IIT), Chennai under the banner of the Department of Biotechnology, Government of India is an award-winning device which has achieved international regulatory approvals in a short time and enhanced the image of "Make-in-India" across the globe.[8]

Finally, the principle of "bespoke clinical and basic science research integration". Our in-house research laboratories have successfully integrated with our clinicians' needs in developing services and algorithms to address unmet clinical challenges. Noninvasively collected tears of preterm infants are being analyzed to predict which infants would progress and develop ROP.[9,10] Our foray into gene therapy to treat inherited retinal dystrophies in another example.

To make all these programs successful, it is essential to have a passionate team of eye care specialists. By creating a stress-free work atmosphere, built on mutual trust, and freedom to "think out-of-the-box" we are fortunate that we have been able to take these baby steps in the world of pediatric eye care. There is a lot more to be done before we can bring pediatric eye care to the level of cataract management. Although as it is said, a journey of a thousand miles begins with a single step, we need to continue to walk along this journey.

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Dr. K Bhujang Shetty

Dr. K. Bhujang Shetty, a Karnataka Rajyotsava Awardee 2010, is the Founder Chairman and Managing Director of Narayana Nethralaya Eye Hospital. He graduated from the Bangalore Medical College and obtained Masters' degree in Ophthalmology from the Regional Institute of Ophthalmology, Minto Eye Hospital, Bangalore. Dr. Shetty started his professional career in 1983 as a solo eye surgeon in a humble clinic in Bangalore and named it Narayana Nethralaya. In 1993, he moved to the present premises, which has since exponentially expanded. Narayana Nethralaya is now a quaternary care referral hospital providing cutting edge clinical care, a premier teaching institute with postgraduate degrees and fellowships, and an eminent research institute, where new knowledge is created and new treatment modalities for challenging problems are explored. Some of the awards conferred on Dr. Shetty for his yeomen services in the field of ophthalmology include the Kempegowda Prashashti, Prof. Dr K Subramanian Oration, Dr. A K Grover Oration, Dr. T. Agarwal Gold Medal and Vocational Excellence Award. He is also the founder president of the Bangalore Ophthalmic Society. Dr. Shetty's immense energy and peace comes from deep-rooted spirituality. His book "The Power of Love" has inspired people to practice a pragmatic philosophy for everyday living.