Role of Optometrist in Eye Hospitals

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Optometrists are important members of the eyecare team in an eye hospital. They take care of a predominant portion in the outpatient services. The role of the optometrist in the hospital set-up has expanded since its inception. In the early 1980s, the principal role of the optometrist in the hospital set-up was the performance of clinical refraction, while the ophthalmologist would prescribe the glasses. The period from mid-1980s to the early 1990s saw the evolution of optometry education into a degree programme that looked beyond basic refraction into other aspects of outpatient management. Today, optometrists play a complementary role to ophthalmologists in the tertiary eye care setup. With the addition of many more dimensions, it has developed into a multi-faceted role with ever increasing scope and responsibility.

In a recent study in UK, the extended role of the optometrists in eye hospital was found to be significant in the areas like glaucoma, macula, medical retina/diabetes, cataract and corneal services. A wide variety of clinical procedures are undertaken as part of these services with relative autonomy. Moorfields eye hospital employs optometrists who are employed in roles involving refraction, low vision, contact lenses and clinical trials. Extended roles involve service in departments such as cataract, external diseases, glaucoma, medical retina including diabetic screening and management and paediatric services.

As a frontline service provider in tertiary eye hospital

Optometrists are the frontline service providers in a tertiary eyecare hospital. They document history, perform clinical refraction, evaluate basic components of binocular vision, examine the anterior structures of the eye using the slit lamp biomicroscope, and measure intraocular pressure using the applanation tonometer and finally advise the patients for dilatation. This first level of evaluation aids the ophthalmologist in diagnosis and arriving at an appropriate treatment plan following retinal evaluation. The optometrist therefore not only performs a detailed ocular examination but also facilitates diagnosis, management of more patients by a single ophthalmologist and accurate documentation of the entire procedure.

Optometrists are spread across the hospital in different clinics, namely general ophthalmology, glaucoma, neuro-ophthalmology, paediatric ophthalmology, uvea, vitreo-retina, cornea, LASIK, and oculoplasty. In each of these clinics, the role of the optometrists as the first-line service providers varies. In the glaucoma clinic, in addition to doing routine procedures, optometrists are engaged in additional diagnostic procedures such as gonioscopy using Goldmann 4-mirror gonioscope and indicate or perform any additional tests that may be needed. A study at the Moorfields Eye Hospital of four resident optometrists and three medical clinicians showed that of the 50 patients examined, agreement between optometrists and consultants in glaucoma clinical decision making was at least as good as that between medical clinicians and consultants. The study opined that within an appropriate environment, optometrists can work safely as part of hospital glaucoma team in outpatient clinics. Similarly, in patients showing signs such as strabismus, ptosis, red eyes, watery eyes, etc. the relevant clinical evaluation performed by the optometrist to document the findings enables accurate diagnosis.

Optometrists in the diagnostic arena in tertiary eye hospital

Optometrists play more than a technician’s role in handling various instruments in a tertiary eye care hospital. They handle almost all the diagnostic instruments in the clinics. The advantage of adding their interpretation in all diagnostics reports is a useful contribution in busy set-ups such as the tertiary eye care hospitals in India. Presently they handle automated perimeter, ultrasound biomicroscope, electrophysiological instruments and various imaging devices from anterior to posterior aspects of the eye. Given that their education includes an understanding of the pathophysiology of ocular diseases, their ability to perform the test and interpret the reports is unparalleled. Highly qualified and passionate optometrists have contributed enormously by enhancing the quality of the services in these set-ups on many occasions.

As a biometrist in tertiary eye care hospital

Patients who are advised for cataract surgery are referred to the biometrist. Biometrists measure corneal curvature and axial length and calculate intraocular lens power using appropriate formula for the surgeon’s targeted refractive outcome. The challenges of adopting appropriate procedures to arrive at the right IOL power among patients who have a history of corneal refractive surgery, silicone oil in-situ or a corneal opacity is one of the
major ways in which optometrists contribute to the success of cataract surgery. In addition, they also play a supporting role in selecting premium intraocular lenses like multifocal and toric lenses that would be appropriate for the patient.

**As an independent vision care provider in tertiary eye care hospital**

Independently, optometrists evaluate patients requiring a regular eye check-up and prescribe glasses. In case of no indication for a dilated eye examination, the central “retina” is evaluated using a direct or non-mydriatic ophthalmoscope. Patients are further appropriately referred to ophthalmologists or other appropriate health care professionals when required.

**As a contact lens care practitioner**

Optometrists also independently counsel, fit prescribe and dispense contact lenses in a tertiary eye care hospital. The patients are generally referred by ophthalmologists from various internal clinics and/or from outside hospitals. The uniqueness of contact lens practitioners in such centres lies not only in handling patients with simple refractive error but also in fitting contact lenses for the specialized and complicated cases. Prescription of various contact lens types such as toric lenses (for astigmatism), multifocal lenses, contact lenses for irregular corneas, myopia control contact lenses etc. are commonly handled in this clinic by the optometrist trained in this specialty.

**As a low vision care practitioner**

This is a core area for the optometrist in the area of vision rehabilitation. With the advent of newer technologies, optometrists play a significant role for people with irreparable vision loss by understanding their day-to-day visual needs and provide them with appropriate low vision care interventions and/ or other forms of rehabilitation. They also teach, educate the patient about the usage of these novel devices and therefore enable patients to use their existing vision in accomplishing daily visual tasks. Children with multiple disabilities and vision impairment need special attention from optometrists specialized in vision development to attend to the assessment and management of visual issues.

**As an occupational optometry practitioner**

Occupational optometrists in the industrial set-up are vital in pre-employment vision care services, provision of periodic eye care and in the development of vision standards for various occupations. The step-by-step clinical approach for this specialization is discussed in another article in this issue.3

**As a binocular vision care provider**

The advent of technology has caught up with the growing needs of every individual from birth. On the one hand, this has brought updated information to fill the dearth of knowledge, but on the other hand it has placed additional demands on the visual system to retain its efficient functionality. Recent epidemiological and clinical data show the prevalence of binocular vision anomalies to be at an alarming 30%,⁴ almost six-fold more than the need for refractive correction. This emphasizes the need for a trained team of optometrists to diagnose and manage these non-strabismus binocular vision anomalies. These optometrists would focus on enhancing the visual skills necessary for reading, learning, sports and all visually demanding tasks requiring binocular vision and stereopsis.

The scope of binocular vision care is not just limited to the clinic. It can be taken to the community at the level of work place of an individual or to the school set-up of children. Occupational vision care specific to binocular vision demands⁴ requires optometric expertise. Models of vision care have been developed to establish this set-up in a comprehensive, feasible and structured way. Children with special needs such as reading and learning disability are highly vulnerable to the development of various visual issues. Binocular vision anomalies are highly predominant in this population, thus demanding the role of optometrists in the thorough assessment and management of these anomalies. The optometry team have an ever expanding and never ceasing demand in these arenas of clinical and community care of binocular vision.

Vision therapy, the art of training the accommodation, vergence, oculomotor and deficient visual functions requires the care and attention of optometrists. This is because they understand the complex functionality of the binocular visual system and the scientific basis of vision therapy so as to customize the vision therapy for every individual.

**Neuro-optometry care**

Neuro-optometry clinic is the brain child of an advancing era of binocular vision clinic. This clinic comprising of the multidisciplinary team of neuro-ophthalmologists, neurologists, neuro-optometrists and vision therapy team seeks to advance the art and science of visual rehabilitation of the neurologically challenged population. 60% of traumatic brain injuries in India is attributed to road traffic accidents (RTA), with mortality and morbidity rates of 0.12 million and 1.27 million, respectively.⁵ Binocular vision anomalies such as convergence insufficiency (CI), accommodative insufficiency (AI) and saccadic dysfunction are commonest sequelae after the injury.⁶ In such a scenario, neuro-optometry care is essential to serve this neurologically challenged population in

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Aspects of diagnosis, optometric management and rehabilitation.

**Amblyopia clinic**
The understanding of amblyopia has moved on from simple visual acuity deficit to deficits of higher levels of visual processing. It is now termed a syndrome, rather than a condition. With better characterization of the deficits, there is enhanced understanding of the plasticity of the visual system and options in the treatment of amblyopia. Optometrists as vision scientists along with paediatric ophthalmologists can effectively tackle this by comprehensive assessment of visual functions and by laying out an appropriate structure of treatment to restore the visual functions of the amblyopic visual system. Does this pertain only to a child’s visual system? Definitely not. Recent research suggests that matured brain of an amblyopic visual system also has the potential and plasticity to respond to treatment through perceptual learning. Perceptual learning modifies the receptive fields of cells of the visual cortex in the brain through a stronger stimulation. Our clinical experience at the Srimathi Sundari Subramanian Department of Visual psychophysics at Sankara Nethralaya has aided in better understanding of this new treatment for adult amblyopia. After 20 h of a first person action videogame play, we observed improvements in visual acuity, contrast sensitivity of the amblyopic eye and also in the stereo acuity in anisometropic amblyopes. Improvement in visual acuity in the amblyopic eye ranged between 1 and 1.5 lines of log MAR visual acuity. Through their in-depth understanding and by application of current findings in vision research, optometrists could make a difference in the assessment and management of amblyopia.

**Myopia clinic**
The sweeping increasing prevalence of myopia worldwide has resulted in a corresponding interest in myopia research. The amount of research has steadily progressed with myopia progression and prevalence compared to a decade-old data. This trend warrants the need to understand the ethnicity-specific mechanisms behind myopia in our population. Optometrists’ contribution in this specialty does add a lot of value in planning a future template for myopia treatment. Literature reports contain strong evidence that reduced outdoor exposure is one of the causes of increasing prevalence of myopia worldwide. The optometrist’s role in bringing in awareness among the parents for their children on this aspect is indispensable. There are various myopia control interventions which are coming into practice in which the optometrist serves as a key player in offering the clinical services to children.

**Understanding the mechanisms of binocular vision anomalies as a researcher**
In a tertiary eye care set-up, optometrists as vision scientists contribute to the understanding of binocular vision anomalies through research thus paving the way for structured treatment protocols. As detailed above, binocular vision anomalies such as convergence insufficiency, amblyopia, eye movement disorders due to neurological damage and myopia require the attention and care of the specialty optometry team in a tertiary eye care set-up. The clinical care of these anomalies when backed up by scientific evidence from the research team would bear testimony to the benefits of evidence based practice in eye and vision care. Optometrists should utilize the tertiary eye care platform to expand, spread and explore these pathways thus strengthening the role of optometrists in the eye/vision care spectrum.

**Concept of review clinics in tertiary eye care hospital**
In the clinical set-up, a review clinic run by an optometrist can cater to individuals who are coming for review or follow-up check-up, so as to accommodate new patients in the outpatient department. In the review clinic, the optometrist can review the previous records of the patient and evaluate the ocular status as per the protocol of the respective clinic and if found to be clinically stable can counsel the patient accordingly. Only for those patients, who have clinical findings significantly different (as per the clinical protocol) from the previous visit, referral to the appropriate ophthalmology specialist would be required. This would help the system to accommodate new patients who seek consultation with the specialized ophthalmologist to a large extent. Glaucoma review clinic and Amblyopia clinic are some of the clinics which appropriately fit into the review clinic systems of a tertiary eye care system.

The role of optometrist in pre- and post-surgical procedures and counselling in hospital set-up are evolving as an extended role of the profession. With the advent of many types of intraocular lenses, the optometrist can be an appropriate professional to explain in detail the various types of the lenses to help in decision-making of the patient. They would also be good choice to explain about the advantages and limitations of various interventions suggested by the ophthalmologists.

Another upcoming extended role of optometrists is in the area of dry eye. Optometrists could administer the ocular surface disease (OSD) questionnaire, do appropriate eye tests and arrive at the diagnosis. If diagnosis is confirmed, the optometrists would refer to the ophthalmologists for appropriate intervention.

**As a dispensing optician**
Optometrists play a very important professional role in the optical services in tertiary eye care hospital.
Once the patient brings the glass prescription, the optometrist guides the patient through the process of selecting appropriate lens and frame materials as well as the type or design that would suit the individual cosmetically and fit adequately. This is an art by itself and the role of optometrist is undoubtedly important in such a set-up. Optometrists are also needed to ensure the quality of the glasses that come from the dispensing workshop before being delivered to the patient. In such a set-up, the optometrist ensures that the vision with the new spectacle is as per the prescription. If the vision is not as desired, the process of identifying the reason within the optical set-up becomes easy and avoids unwarranted delay for the patients. Moreover, optometrists are better suited to play an administrative role in the optical services of tertiary eye care hospital due to their know-how.

As an oculist
Optometrists with an inclination to art, especially to drawing and painting, are found to be contributing immensely in this clinic. This is a clinic wherein the one-eyed patients get custom-made artificial eyes that match with the fellow eye cosmetically. Usually this clinic is run in association with ocuoplasty and ocular trauma clinics of tertiary eye care hospital.

As a community outreach optometrist
Optometrists in tertiary eye care hospitals also play a significant role in the outreach activities of the tertiary eye care hospital. From coordinating, supervising and executing the outreach programme, they are part of the vision care team in a variety of outreach programmes – school vision screening, cataract screening, diabetic retinopathy screening, glaucoma screening, tele-screening, mobile eye surgical unit, etc., Optometrist innovate in the outreach activities. For example, the “One-Day Mass Vision Screening” concept is one such innovation. The idea of including exclusive binocular vision screening among the school children to screen for binocular vision anomalies that could possibly interfere with reading and therefore impact academic performance was also the contribution of the optometrist. Apart from screening, creating awareness among the public on common eye ailments through innovative methods like installation of vision charts in public places and door to door awareness sessions are also part of outreach. Training volunteers, school and college children as “vision ambassadors” on basic vision screening are a worthwhile initiative. Optometrists will have a huge role to play in mobile eye clinics which can provide comprehensive eye care services at the doorstep of the patient and especially for those who are bed-ridden.

As a vision science researcher
Optometrists in tertiary eye care hospital also play a role as a vision science researcher. They collaborate with other vision scientists and do fundamental, clinical and public health-related researches. Their contributions in glaucoma, cataract, refractive error, amblyopia, occupational health, contact lens care, low vision care, binocular vision care, community care, diabetic retinopathy and other retinal conditions are routine. Optometrists are also stepping into integrated research with basic science researchers thus paving the way for translational research – the need of the hour.

As educators in tertiary eye care hospital
Optometrists with adequate clinical experience usually involve in teaching new comers and the students. They actively participate in clinical grand rounds and regular classes for the students. They also are part of the team, organizing scientific conferences and regular continuous medical education.

As administrative personnel
Optometrists’ play the administrative role of managing various optometry clinics within a tertiary eye care hospital. In addition to the clinical services, they head specialty clinics such as low vision care, binocular vision care and contact lens clinic. They are capable of donning an administrative role and help in planning further expansion in an eye care hospital.

In conclusion, the role of optometrist in tertiary eye care hospital ranges from predominant clinical roles in refraction, low vision care and binocular vision care, to extended roles in various clinics, education, research, training and administration and furthermore up to changing the scenario of tertiary eye care services in the country. This integrated role of optometrists catering to the vision care needs and ophthalmologists attending to medical needs of the patient within a tertiary eye care set-up establishes a healthy foundation for the expansion and development of the eye care profession for the betterment of the needy at large.

References