Ocularists the less known mid eye care professionals and their contribution in eye health care

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Abstract:
Ocularists are ophthalmic technicians usually working at oculoplastics departments in tertiary eye hospitals. They prepare, provide, fit and maintain ocular or orbital prosthesis. Improving the esthetics of eye and face improves the patient’s personality, self-confidence, self-esteem, and health-related quality of life. Hence, their contribution as team-member of the oculoplasty department is significant. Ocularists work with patients with congenital anomalies of the orbit/eye and individuals who have undergone removal of the globe due to trauma, tumor, or painful blinding disease. This brief communication will outline some of their job responsibilities, interaction with patients, scope of duties, and providing modern eye care.

Keywords:
Ocularist; anaplastology; orbit; rehabilitation

Artificial eye fabrication has been practiced since ancient times by Roman and Egyptian priests.[1] At that time, artificial eyes were made of painted clay attached to cloth and worn outside the socket. Currently, prosthetic eyes are implanted in the eye socket enclosed within the eyelids. These prostheses have been manufactured in Europe since the 16th century. Improving the aesthetics of eye and the face of a patient improves his/her personality, self-confidence, and health-related quality of life.[2] An ocularist is trained technician who specializes in fitting a patient with a prosthetic eye after management by an ophthalmologist. Ocularists are trained in assessing the status of the orbit, fabricating and fitting a cosmetic ocular prosthesis and periodically monitoring the prosthesis and related tissues.

In addition to making a customized ocular prosthesis, they also prepare acrylic conformers, stem conformers, pressure conformers, and socket expanders. These skilled technicians ensure correct fitting, shaping, and painting of ocular prosthesis. The ocularist also educates the patient on handling and care of the prosthesis. Ocularists provide long-term care through follow-up examinations for evaluation and polishing prosthesis.[3]

An ocularist’s purview does involve saving eyesight or preventing eye diseases their primary contribution is significant in global initiative of achieving the 4th agenda of the Sustainable Development Goals by 2030.[4]

Patients initially present to an ocularist after surgical removal of the eye. After surgical removal of the eye, the patient must allow at least 6 weeks for healing prior to the first visit to an ocularist. Usually, in this the first visit, the ocularist removes the conformer that is usually placed in the orbit immediately after surgery to avoid contracture. After removal, the ocularist examines the socket, and then explains the procedure for fitting the ocular prosthesis to the patient. At that time, patients see examples of the realistic, natural appearance of prosthetic eyes and the mobility of the prosthesis.[5]

An ocularist measures the patient’s eye socket at the first visit, reviews the orbital shape and matches the color of prosthesis to the iris and sclera of the fellow eye. When the prosthesis is ready, the ocularist fits into the orbit, and performs minor adjustments to perfect the overall

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appearance of the prosthesis. The ocularist teaches the patients insertion, removal, and proper care of the prosthesis. Similar to maintaining hard contact lenses, ocular prosthesis also require regular polishing to restore the acrylic finish and maintain the health of the surrounding tissues. Patient with prosthesis should visit an ocularist once or twice a year. An ocular prosthesis is usually replaced every 5 years.

Recent developments in ocular implant technology have placed new demands on those who practice the art and science of ocularistry. Anaplastology is a branch of medicine dealing with the prosthetic rehabilitation of an absent, disfigured or malformed orbit which is anatomically at a critical location of the face. An anaplastologist (also known as a maxillofacial prosthetist and technologist) is an individual who has the knowledge and skills to customize a facial (craniofacial prosthesis), ocular, or somatic prosthesis. An anaplastologist can be ocularists, a dentist who specializes in maxillofacial prosthetics (prosthodontics) and a dental technologist. Recently, technology to create a highly mobile and fully supported prosthesis has improved. This has also increased the patient expectations and expectations of health-care professionals regarding placement of ocular prosthesis.

Ocularists require manual dexterity, strength, stamina, and patience to create ocular prosthesis. Many are mechanical geniuses, inventive, and creative people with sound decision-making skills. They work both in isolation and as part of a team for producing good quality product quickly. Ocularists enjoy working with tools and machinery. Their tasks include designing, fabricating, coloring and fitting ocular prosthesis, conformers, and implants. Working closely with an oculoplastic surgeon is paramount in solving socket fitting problems. They counsel patients on the loss of depth perception due to monocularity. Every patient is educated on the importance of wearing protective goggles at every visit. Ocularists also repair and maintain fabrication and laboratory equipment. Ocularist works with ophthalmologists to review and advice patients about the option of inserting ocular prosthesis surgically.

Ocularists are employed in artificial eye laboratories, optometry offices, clinics, and studios. They may also be self-employed. An ocularist generally works 40-h a week with occasional overtime on evenings and weekends to accommodate patient schedules. He/she spends most of their time indoors, either alone or working with others.

As ocularists have good manual dexterity they can also work in other fields such as orthotics or prosthetic technology. Professionally, advancement may also include supervisory roles at a laboratory or starting private business in the field.

An apprenticeship with an approved ocularist must be completed to become an ocularist in the USA or in Canada. The apprentice program through the American Society of Ocularists (ASO) requires an apprentice to study all aspects of ocular prosthetics and spend 5 years or 10,000 h in practical training. The apprentice must also successfully complete 750 credits of related study courses offered by the education program of the ASO. On successful completion of all requirements, the “Diplomate of the American Society of Ocularists” is awarded.

The studies of an anaplastologist consist of arts and sciences. Visual arts include photography, illustration, sculpture, and painting. The science components of their education include biology, behavioral science, materials science, and physics. Areas of study with special emphasis include, superficial anatomy and physiology, polymer science, optics, dermatology, oral and maxillofacial surgery, otolaryngology, and oncology. Certification in the field of anaplastology is provided by the Board for Certification in Clinical Anaplastology (BCCA). Professionals certified by the BCCA are designated as Certified Clinical Anaplastologists (CCA) and denote their credential with the CCA title.

In the United Kingdom, the National Artificial Eye Service, a part of the National Health Service, includes fitting and fabricating ocular prosthesis. There is no formal course on ocular prosthetics. In this service, experts train two types of mid-level eye care professionals; orbital prosthetist (OP) and ocular technician. OPs (eye fitters) are involved with all the direct patient contact and the fitting and aftercare of artificial eyes. Ocular technicians manufacture the artificial eyes. The training of an OP can take from 3 to 5 years. Ocular technician training is 9 months. Excellent color vision is a prerequisite for joining both professions.

In India, ocularists are trained at different institutes and are registered by the Indian Society of Ocularists. Some renowned training centers include LV Prasad eye institute, Hyderabad, Andhra Pradesh, Arvind eye care system, Pondicherry, and Chinmaya Ocular prosthetics, Delhi. Candidate must be science graduates with exposure to optometry to join the training program. Ocularists have adopted advances in technology and use imaging technology for measurement of eye and orbit. Newer developments have increased clinical application of 3D printing in making prosthesis and scaffolds for bone regeneration following fractures. These technologies represent opportunities for ocularists to improve care of their patients. Capacity building of existing ocularists in these technologies is recommended.

We attempted to calculate the need for ocularists in a defined population. By mid-2016 the population estimate of Saudi Arabia was 21.6 million. The workload on three ocularists in the past 5 years at a tertiary eye center in central Saudi Arabia is presented in Table 1. It is the basis for reviewing the current status and need for ocularists. There are five ocularists working in KSA (3 in our institute and two in the private sector). In our institute, we receive three to four new cases per day and around 21–24 scheduled follow-ups in addition to walk-in...
Table 1: Workload of an ocularist between 2011 and 2015 at King Khaled Eye Specialist Hospital, Saudi Arabia

| Topic                                      | Number | Resources |
|--------------------------------------------|--------|-----------|
| Number of ocularists                      | 3      |           |
| Average working days in a year             | 215    |           |
| Number of clients attended in 5 years      | 31,540 |           |
| Number of clients attended per year        | 6308   |           |
| Number of new fitting cases per day        | 3-6    |           |
| Making a new prosthesis                   | 6-7 h  |           |
| Making thin hand painted cosmetic shell    | 6-7 h  |           |
| Major modification of old prosthesis       | 3 h    |           |
| Providing regular conformers to phthisical eye | 1 h   |           |
| Pressure conformer for shallow fornixes    | 30 min-1 h |        |
| Contracted socket of a child providing conformer to expand the socket 6 weekly follow-up and changing the conformer | 30 min-1 h |        |

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patients who are referred from oculoplasty, ocular oncology, and glaucoma clinics. For an average of six clients in a day per ocularist, at least 10 ocularists are required (without delay) in order to adequately address the patient load in KSA. One ocularist takes 6 h and prepares one prosthesis per day (personal communication with the staff of oculoplasty unit of our institution). Thus, we projected that one ocularist per 2 million population should be a short-term goal (by year 2020). The subspecialty of oculoplasty are commissioned in different regions of Saudi Arabia under medical cities. Ocularist could be appointed and they should be provided adequate resources to undertake their work in the region. As a long-term goal, science graduates could be identified and trained (5 per year) in existing training centers globally and then given hands on training under supervision of the existing ocularists in Saudi Arabia.

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Conflicts of interest
There are no conflicts of interest.

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