GARO MEGHRIGIAN EYE INSTITUTE FOR PREVENTIVE OPHTHALMOLOGY
CENTER FOR HEALTH SERVICES RESEARCH AND DEVELOPMENT
THE AMERICAN UNIVERSITY OF ARMENIA

Strengthening Regional Ophthalmic Services in Gegharkunik Marz of Armenia: Human Resource Development

Report to
Lions Club International Foundation

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LCIF SightFirst grant and banking information

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Project Goals and Objectives:

The specific aims of the project are:

- **Needs Assessment**
  Community needs for cataract intervention in Gegharkunik marz will be assessed using the Rapid Survey of Cataract Surgical Services (RACSS) methodology. The RACCS technique optimizes the use of limited sources for data collection, data entry, and analysis through the use of a simplified but valid survey methodology and a specially developed software package. This approach also establishes baseline measures against which to monitor and evaluate the program's success.

- **Build infrastructure**
  A regional ophthalmic unit (ROU) will be established/renovated according to MOH standards and equipped per the WHO standard list. Standardized systems and procedures for the staff and patients will also be developed.

- **Develop human resources**
  Key personnel will receive training specifically developed for their needs. Training will consist of international experiences, local academic training, and local practical training covering both treatment and management skills as appropriate for the person's role in the new system of care.

- **Establish Village Examination Centers**
  Village Examination Centers (1 per 10 villages) will be established in the selected village ambulatories. These ambulatories will be equipped with minimal necessary equipment for basic eye screening and its staff (nurses) trained.

- **Increase demand for eye care**
  ROU's personnel will complete mass screenings of people 50 years and over in Gegharkunik marz (~20,000 people).

- **Provide high quality surgery**
  All prevalent cases of bilateral blinding cataract (estimated ~1,000-1,500) in Gegharkunik marz of Armenia will be identified and treated during a 1.5-year period.

- **Evaluate the program and develop policy recommendations**
  The project will be evaluated throughout so as to provide timely information for effective monitoring of the project and development of policy recommendations for the Ministry of Health of Armenia and Lions Club International Foundation regarding improvement of the regional ophthalmic services.

Key Project Participants

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Dr. Thompson provided consultation and guidance throughout the training. He was responsible for the oversight of the training phase of the project and its adherence to the project proposal and approved budget.

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Dr. Petrosyan was also responsible for the curricular oversight, and development of financial and management components, as well as for overall quality assurance of the training phase of the project.

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Principal Investigator, Garo Meghrigian Eye Institute for Preventive Ophthalmology
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Dr. Khachatryan was responsible for the design and management of the training phase, its evaluation, as well as for the development of training curricula.

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Dr. Najaryan was responsible for all preparatory activities, organizational and logistic issues, day to day management and monitoring, as well as preparing the final financial and narrative reports to the donor. She was involved in preparing lectures and teaching during the Public Health Ophthalmology course.

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Dr. Kirakosyan participated in the preparatory activities during the training phase of the project, and assisted in various organizational and logistic activities.
She was actively involved in developing the following training curricula:

- Refresher course for the ophthalmologists (English, Armenian, and Russian versions)
- Specialization program for ophthalmic mid level personnel (English, Armenian, and Russian versions)
- Primary Eye Care training for mid level health personnel (English and Armenian versions)

She along with another GMEIPO consultant, Varsik Hakobyan, developed a brochure on basics of ophthalmology for mid level health personnel (in English and Armenian) and conducted two sessions of two-day trainings of 20 village ambulatory nurses in Gegharkunik and Tavush marzes.
Dr. Kirakosyan was also involved in preparing lectures and teaching during the Public Health Ophthalmology course.

Varsik Hakobyan, MD, Ophthalmologist
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Dr. Hakobyan took part in the preparatory activities during the training phase of the project.
She was actively involved in developing the following training curricula:

- Refresher course for the ophthalmologists (English, Armenian, and Russian versions)
- Specialization program for ophthalmic mid level personnel (English, Armenian, and Russian versions)
- Primary Eye Care training for mid level health personnel (English and Armenian versions)

She along with Lilit Kirakosyan, developed a brochure on basics of ophthalmology for mid level health personnel (in English and Armenian) and conducted two sessions of two-day trainings of 20 village ambulatory nurses in Gegharkunik and Tavush marzes.
Dr. Hakobyan was also involved in preparing lectures and teaching during the Public Health Ophthalmology course.

Levon Barseghyan, Ophthalmic surgeon, Professor
Head of the Ophthalmology Department, Kanaker-Zeytun Medical union
Head of the Ophthalmology Chair, National Institute of Health, RA

Dr. Barseghyan provided specialized ophthalmic consultation throughout the project. He was responsible for overseeing training curricula developed by GMEIPO staff complied with MOH and NIH standards. He was the main executor of the trainings for Sevan and Ijevan ROU's staff at the Ophthalmology Chair of the National Institute of Health.

The following ophthalmologists were trained:

Gevorg Baraghamyan, ophthalmic surgeon, Sevan ROU *(IOL Microsurgery and Small Incision Cataract Surgery Training at Lions Aravind Institute for Community Ophthalmology (LAICO), and Public Health Ophthalmology (PHO) training at GMEIPO)*

Armen Dallakyan, ophthalmologist, Ijevan policlinic *(Course on Advanced Methods of Eye Diseases Diagnostics and Treatment at National Institute of Health (NIH), and Public Health Ophthalmology (PHO) training at GMEIPO)*

Margarit Margaryan, ophthalmologist, Sevan ROU (*Course on Advanced Methods of Eye Diseases Diagnostics and Treatment at National Institute of Health (NIH), and Public Health Ophthalmology (PHO) training at GMEIPO)*

The following ophthalmic nurses were trained:

Shogher Mirzoyan, ophthalmic nurse, Ijevan policlinic (*Refresher Course for Ophthalmic Nurses at National Institute of Health (NIH), and Public Health Ophthalmology (PHO) training at GMEIPO)*

Hripsik Kocharyan, ophthalmic nurse, Sevan ROU (*Refresher Course for Ophthalmic Nurses at National Institute of Health (NIH), Certificate Course on Clinical and Supervisory Skills Development in Ophthalmic Paramedical Personnel at LAICO, and Public Health Ophthalmology (PHO) training at GMEIPO)*

Narine Navasardyan, ophthalmic nurse, Sevan ROU (*Refresher Course for Ophthalmic Nurses at National Institute of Health (NIH), Certificate Course on Clinical and Supervisory Skills Development in Ophthalmic Paramedical Personnel at LAICO, and Public Health Ophthalmology (PHO) training at GMEIPO)*

The following primary care nurses were trained:

Shushan Najaryan (Gegharkunik marz, Sevan region, village Chkalovka)
Satik Davtyan (Gegharkunik marz, Sevan region, village Geghamavan)
Laura Galustyan (Gegharkunik marz, Vardenis region, village Shatvan)
Tamara Shirvanyan (Gegharkunik marz, Vardenis region, village Metc Masrik)
Arpenik Ghazaryan (Gegharkunik marz, Gavar region, village Gandzak)
Naira Avetisyan (Gegharkunik marz, Gavar region, village Tsakhkashen)
Greta Lazaryan (Gegharkunik marz, Chambarak region, Chambarak)
Tamara Poghosyan (Gegharkunik marz, Chambarak region, village Vahan)
Shushik Sukiasyan (Gegharkunik marz, Martuni region, village Lichk)
Ani Stepanyan (Gegharkunik marz, Martuni region, village Astghadzor)
Israyelyan Alina (Tavush marz, Noyemberyan region, village Jujevan)
Bozinyan Sonya (Tavush marz, Noyemberyan region, village Baghanis)
Musayelyan Karine (Tavush marz, Ijevan region, village Aghavnavank)
Zakharyan Gayane (Tavush marz, Ijevan region, village Khachardzan)
Tamrazyan Anjela (Tavush marz, Dilijan region, village Hagharcin and Teghut)
Asatryan Karine (Tavush marz, Ijevan region, village Sarigyugh)
Bughdaryan Lida (Tavush marz, Ijevan region, village Berkaber)
Ghazaryan Sona (Tavush marz, Ijevan region, village Tskahkavan)
Tandilyan Manush (Tavush marz, Noyemberyan region, village Koti and Barekamavan)
Ghushchyan Irina (Tavush marz, Noyemberyan region, village Koti and Barekamavan)

Executive Summary

The Garo Meghrigian Eye Institute for Preventive Ophthalmology (GMEIPO) of the Center for Health Services Research and Development (CHSR) at the American University of Armenia (AUA) in collaboration with the Ararat Lions Club of Armenia (ALC) implemented needs assessment (mass screening of population) as a part of the 3-year project aimed at strengthening ophthalmic services of the remote and underserved regions of Gegharkunik.

This report presents the summary of the human resource development component of the aforementioned project. This component itself consisted of three main subcomponents, among which were: development of training curriculum, local training, and training at the Lions Aravind Institute for Community Ophthalmology.

GMEIPO staff, with the support of the leading specialists of the Ophthalmology Chair of the National Institute of Health (NIH), developed a 4-week specialization program for ophthalmic nurses and a 7-week refresher course for practicing ophthalmologists. Detailed course curricula were approved by the National Institute of Health.

Based on the developed course, the training of ophthalmologists was organized at the Ophthalmology Chair of NIH. Two ophthalmologists (one from Ijevan and the other from Sevan) passed a 7-week refresher course on ophthalmology. The training provided theoretical knowledge and practical skills on contemporary methods of eye disease prevention, diagnostics and treatment. After successful completion of the training, the ophthalmologists were awarded certificates.

Nurse training was also organized at the Ophthalmology Chair of NIH. Three nurses (one from Ijevan and two from Sevan) passed a 4-week intensive specialization training based on the specialization program developed jointly by the GMEIPO ophthalmic staff and specialists of the Ophthalmology Chair of NIH. It was specially designed to enhance management and surgical skills of nurses. After completion of the course, the nurses were awarded certificates.

AUA/GMEIPO staff developed a detailed curriculum for a two-week training for eye care professionals on Public Health Ophthalmology (PHO). The course emphasizes the basics of epidemiology and biostatistics, epidemiology of major blinding disease, main principles of needs assessment, planning, management, and evaluation of eye care programs. The course was designed for ophthalmologist in training, practicing ophthalmologist, optometrists and ophthalmic nurses with a career interest in public health programs in eye care.

Based on the PHO curriculum, a two-week training was organized for three ophthalmologists and three nurses. The course was slightly modified and adapted to meet the learning requirements of the trainees. The course equipped the ophthalmic personnel of the selected marzes with knowledge and skills of eye care program design, evaluation, interpretation of available data on eye care and eye pathologies and critical assessment of existing services in their settings, as well as in other regions of Armenia.

Jinishian Memorial Foundation's (JMF) generous contribution fully covered trainings at NIH and PHO training at AUA/GMEIPO.

In the framework of establishment of village examination centers (VECs), AUA/GMEIPO ophthalmic personnel developed a two-day training for primary care nurses. The course was developed based on WHO Primary Eye Care guidelines. It provides information on basics of anatomy and physiology of the eye, common eye problems and disorders diagnosed and dealt with at the primary health care level. Moreover, the concept of Vision 2020 - The Right to Sight and the role of the nurses in combating the problem of blindness is also included in the course syllabus. In addition, a brochure on basics of ophthalmology for primary care and

family nurses was developed and distributed to all nurses who participated in the trainings. Based on the developed course, two sessions of VEC nurses were organized and conducted by AUA/GMEIPO ophthalmic staff, during which both theoretical knowledge and practical skills of the nurses were upgraded.

To be able to provide local primary eye care and screenings, and to identify patients needing referrals to the ROU, the nurses were given basic ophthalmic equipment and supplies (flashlight, visual acuity charts, hand magnifying lens, eye drops, dressings and bandages, etc.) to equip the village examination centers.

Important part of the human resource development component of the project was international training at Lions Aravind Institute for Community Ophthalmology (LAICO). This training site was chosen based on several merits among which were: its collaboration with World Health Organization (WHO), high patient flow and having structured and high quality variety of training programs offered in different areas of ophthalmology, excellent training facilities, with all nectar aids to master the practical skills and to upgrade the theoretical knowledge of the trainees.

The Sevan ROU nurses passed a three-month certificate course on clinical and supervisory skills development. One of them was trained on different types of eye examination, refraction, out patient care and patient counseling, the second nurse focused mainly on operating theatre, local anesthesia, block practice, sterilization/aseptics, pre- and postop care and counseling, as well as on management of ocular emergencies. The common clinical skills for both groups were equipment maintenance, proper usage, general cleanliness, planning and coordinating of resources and facilities, and medication, in particular pharmacology, and safe medication practice. Also both groups were exposed to different areas of supervisory skills, such as: patient satisfaction, documentation, managing the staff, and planning and scheduling.

The project surgeon was exposed to contemporary methods of cataract surgery, including IOL microsurgery and Small Incision Cataract Surgery (SICS) allowing performing large volume cataract surgeries with lowest rate of post surgical complications, and/or managing complications comfortably and confidently. An important constituent of the training was that the foci were not only on acquiring surgical skills, clinical skills and theoretical knowledge, but also on basics of hospital management, community ophthalmology and outreach programs.

Since there is no institute in the Region, which provides eye care program management, a decision was made to send the project chairperson to LAICO for a two-week management training. The course tackled the most important issues of eye care programming, such as planning, implementation, monitoring, and evaluation. The course was delivered by LAICO leading faculty as well as by invited guest lecturers. The project chairperson had a chance to observe Aravind eye care model and to asses the applicability of its replication in underserved regions of Armenia.

Consequently, human resource development through training of the core ophthalmic staff will have far reaching implications for not only reducing the number of eye pathologies, but also for increasing the quality of cataract surgery in Gegharkunik marz. This also could motivate patients to apply for services in the stage when the chances for good outcomes are high. It will further contribute to combating the problem of blindness by strengthening local capacity and its sustainable development.

1.0. BACKGROUND

Eye care in Armenia is characterized by excessive physical infrastructure and overcapacity in Yerevan eye clinics, including overstaffing of physicians and nurses.

In total, there are 291 ophthalmologists in Armenia, of which 82% (n=238) work in Yerevan, and 18% (n=53) in the rural areas. Of all ophthalmologists, 25% (n=74) are surgeons, others are mainly involved in providing pre- and post- operative care, ambulatory treatment, and measuring refraction. There are 65 surgeons in the city and only 8 for the rural areas. Thus, the ratio of ophthalmic surgeons is 64 per million population in the city, and 4 per million in the rural areas [1-2].

The striking inequality between eye care in the capital and rural areas can be explained by the following factors:

- *Poor financing of eye care in the rural areas.* Since the Government itself is covering eye care for a very small part of the population and health insurance system is not in place yet, particularly in the rural areas, out-of-pocket payments are the most important source of funding for eye care. The economic problems impact rural areas of Armenia more than capital city: the average per capita income is significantly higher in the capital than in marzes [3]. Consequently, the higher paying capacity of the population guarantee high volume of work and much higher earnings for ophthalmologists in the capital, than in the rural areas, which contributes to overstaffing of the ophthalmologists in Yerevan.
- *Poor planning/staffing for present Armenian context.* When the old Soviet model of eye care delivery collapsed, eye care providers were not ready for the new market-oriented approach to health care delivery. Most department heads in the marzes lack contemporary managerial training and expertise critical for success in the new reality

of service-oriented medicine, contributing to financial crisis of the regional eye care units and low efficiency of regional ophthalmologists.

- *Collapse of supporting health system.* In the Soviet model, village ambulatories were responsible for providing primary eye care. Recently many villages lack not only eye care but primary health care as well. Thus, the first level of care, responsible for appropriate demand generation is missing, which contributes to low utilization of regional eye care facilities and low patient volume.

- *Poor equipment and poor working conditions.* Equipment in the Regional Ophthalmic Units (ROUs) is mostly obsolete, sometimes 30-40 years old, lacking proper maintenance due to the unavailability of replacement parts. Facilities of the majority of ROUs need upgrading.

- *Low quality services.* ROU ophthalmologists have almost no access to new knowledge, and in the most cases, poor/outdated training. Because of low patient volume, ROU ophthalmologists are losing skills; lack of regular training for regional ophthalmologists contributes to the low performance as well. In addition, in the regions ophthalmologists make medical decisions with minimal supervision. They are not evaluated on performance or quality of services. The lack of accountability to a higher authority is limited, as performance is rarely, if ever, the basis for reward or penalty.

- *Poor surgical outcomes.* Extra capsular cataract extraction (ECCE) with intra-ocular lens (IOL) implantation is not used in the rural areas. Moreover, due to financial and geographic barriers, patients from rural areas present at later stages of diseases, with worse prognosis and treatment outcomes.

- *Unaffordability of trainings and specialization courses.* At present the State Medical University and NIH deliver the ophthalmic education. The following courses are available:

- 2 week course for medical students, offered by the Yerevan State Medical University.
- 2 week course for family physicians, offered by the Yerevan State Medical University.
- 3 year clinical residency, offered by the Yerevan State Medical University and NIH.
- 7-week refresher courses, offered exclusively by NIH.
- 5-week refresher course at NIH for mid-level eye care personnel.

Almost all courses are chargeable. Low socio-economic status of most of the specialists, especially those from regions, results in low utilization of existing training courses. Regular refresher trainings are covered either partially by the institutions where a specialist works, or fully by the specialist him/herself. However, as most of the institutions are under budgeted, these opportunities are also rare. The absence of licensing system and requirement for continuing medical education also contributes to this problem.

The above mentioned problems emphasize the pressing need to bring high quality ophthalmologic services to isolated regions. In response to this emerging need, the Ararat Lions Club of Armenia (ALC) in collaboration with the Garo Meghrigian Eye Institute for Preventive Ophthalmology (GMEIPO) of the Center for Health Services Research and Development (CHSR) at the American University of Armenia (AUA) is implementing a 3-year project aimed at strengthening ophthalmic services in the remote and undeserved regions of Gegharkunik marz. One component of the project was human resource development. This report presents the results of the training phase of the project.

2.0. SPECIFIC AIMS

The specific aims of the project's training phase were:

- To review present training programs for ophthalmologist and ophthalmic nurse available at the MOH and NIH;
- To develop up to date training curricula for training of ophthalmic nurse and ophthalmologist, building upon existing curricula at the NIH;
- To develop materials on public health ophthalmology content;
- Identify and engage training resources and opportunities;
- Organize and manage training of program participants;

3.0. CURRICULUM DEVELOPMENT

GMEIPO staff, AUA faculty and leading specialists of the National Institute of Health (NIH) developed a detailed curriculum for training the ophthalmologic staff. Staff of the Ophthalmic Department at the NIH provided guidance in the conceptual design of the training materials and provided critical review of work plans and draft materials, as well as made the final revisions of the developed curricula.

Consequently, the following training curricula were developed:

- Specialization Program in Ophthalmology. One-month Training Course for Nurses (in Armenian, Russian and English).
- Continuing Education in Ophthalmology. Two-month Refresher Course for Practicing Ophthalmologists, Ophthalmologists in Training and Primary Health Care Physicians (in Armenian, Russian and English).
- Public Health Ophthalmology Course. Two-week specialization program on basics of public health ophthalmology.
- Two-day training on basics of ophthalmology for primary care nurses

3.1. Specialization Program in Ophthalmology for Ophthalmic Nurses

The program was developed by GMEIPO ophthalmic staff and reviewed by the leading specialists of the Ophthalmology Department of NIH. It was developed in three languages: Russian, Armenian and English. See Appendix I for the detailed syllabus.

The course covers the following main topics:

- Organization of surgical care in ambulatory.
- Aseptics and antiseptics

- General care of the patient
- Preoperative preparation and anesthesia
- Visual organ anatomy
- Visual functions and their examination
- Refraction, errors and their correction
- Eye and its accessory apparatus examination
- Eye and its accessory apparatus diseases (eyelid diseases, diseases of the conjunctiva, lacrimal apparatus, cornea, sclera, uvea, vitreous body, lens, retina, optic nerve and visual pathways)
- Glaucoma
- Eye injuries
- Squint
- Orbital diseases
- Ophthalmooncology
- Eye diseases pharmacotherapy

Teaching of each topic comprises a combination of theoretical and practical trainings. The first part of each training day is planned in a way to cover the theoretical part of the learning material, while the emphasis of the second part of the day is on practical aspects of those topics.

The course provides recommended readings, websites, popular ophthalmologic on-line guides and journals for students' disposal.

By the end of the training course the trainee should:

a. get knowledge on the main principles of eye diseases diagnostics and treatment;

b. master the skills necessary for ophthalmic nurses (see Appendix II);

c. master the main nursing activities (see Appendix III);

d. be able to provide primary eye care, pre- and postoperative care to patients;

e. assist during ophthalmic surgery.

After successful completion of the training, as assessed by the examination committee consisting from the head of the Ophthalmology Chair of NIH and main course executors, the students will be given an official certificate on professional training titled “Refresher Training of Eye Department and Cabinet Nurses”.

3.2. Refresher Course for Ophthalmologists

Based on the available training programs for ophthalmologists in Armenia, GMEIPO ophthalmic staff developed a refresher course for ophthalmologists for 6 weeks. The course was developed in 3 languages: Russian, English and Armenian. See Appendix IV for the detailed syllabus.

The course covers the following main topics:

- Anatomy of the eye and orbit
- Visual functions and their examination
- Eye refraction. Refractive errors and their correction
- Eye and its accessory apparatus examination.
- Diseases of eye and its accessory apparatus
- Eyelid diseases.
- Diseases of the conjunctiva.
- Diseases of the cornea and sclera.
- Diseases of the uvea and vitreous body
- Diseases of the lens
- Diseases of the retina
- Diseases of the optic nerve
- Glaucoma
- Eye injuries
- Squint.

The course main outcomes are:

a. to assimilate a complete course of contemporary ophthalmology;

b. to master in contemporary methods of diagnosing and treating eye pathologies;

c. to master main skills necessary for regional ophthalmologists (see Appendix V)

d. to possess eye microsurgery.

The course provides recommended readings, websites, popular ophthalmologic on-line guides and journals.

After successful completion of the course, students are given an official certificate on professional training, recognized by MOH, RA, titled "Advanced Methods of Eye Disease Diagnostics and Treatment".

3.3. Public Health Ophthalmology Course

AUA/GMEIPO staff developed a detailed curriculum for a two-week training for eye care professionals on public health ophthalmology.

The course was developed in English, and subsequently translated into Armenian and Russian.

The course emphasizes the basics of epidemiology and biostatistics, epidemiology of major blinding diseases; main principles of needs assessment, planning and management of eye care programs. Students will enroll to prepare them to develop eye programs in their district or to work in existing eye programs. Completion of the course will lead to the awarding of a certificate. See Appendix VI for the detailed syllabus.

The primary objective of the developed course is to equip students to develop a community eye care program. By the end of the Public Health Ophthalmology course students should be able to:

- Describe the basic epidemiology of the major blinding eye diseases;

- Distinguish between the various types of studies designed to assess community eye health needs;
- Interpret the results of eye surveys;
- Understand the basic issues surrounding resource mobilization, management and evaluation of local comprehensive eye care programs;
- Conduct a Community Eye Care Needs Assessment;
- Critically appraise and select appropriate control strategies for the major blinding eye diseases;
- Collaborate with other students to produce an eye care program;
- Communicate a program design through presentation.

3.4. Two-day course on basics of ophthalmology

The two-day training for primary care nurses was developed by GMEIPO ophthalmic staff based on World Health Organization (WHO) primary eye care guidelines. Its main rationale is to improve the knowledge and practical skills of the primary eye care personnel in regions/marzes and increase the primary care nurses involvement in the blindness prevention activities. This component of the project was fully covered by GMEIPO in-kind contribution.

The curriculum contains information on basics of anatomy and physiology of the eye, common eye problems and disorders which could be diagnosed and dealt with at the primary health care level, including injuries of the eye globe or eyelids, problems or disorders of acute onset, and problems or disorders of gradual onset. The concept of Vision 2020 - The Right to Sight and the role of the nurses in combating the problem of blindness is also included in the

course, as well as brief presentation of eye care services in Armenia and patient referral systems.

In addition to theoretical knowledge, basic practical skills used for diagnosis and treatment of eye disorders are also introduced (visometry, the upper eye lid evertion, corneal and pupil reactions testing, instillation of eye drops and application of eye ointments, eye pressure measurement using palpation and Maklakov's tonometer, visual field testing, washing of the conjunctival sac, dressing issues, eye bandaging, removal of foreign bodies, etc.).

GMEIPO ophthalmic personnel further developed a brochure on basics of ophthalmology.

The brochure was acknowledged by the Ministry of Health as an educational material for nurses practicing in primary care, involved in general nursing as well as ophthalmic nurses. The quality of the brochure as an educational material was highly assessed by leading ophthalmic specialists. The brochure which is reach in colored visual aids is very useful in helping the nurses to carry out differential diagnostics in their settings.

After successful completion of the course, nurses are given a certificate titled "Primary Eye Care".

4.0. LOCAL TRAINING

4.1. Training Program for Regional Ophthalmic Nurses

One of the objectives of the project was human resource development through the training of core ophthalmologic staff. Within this initiative, two nurses from Sevan ROU (Gegharkunik marz) and one nurse from Ijevan ROU (Tavush marz) were invited for the specialized training at the Ophthalmology Chair of the National Institute of Health (NIH). The Jinishian Memorial Foundation (JMF) fully supported this component of the training (see Appendix VII).

Description of the course

The training started on September 6 and was completed on October 8, 2004. The course was specially designed to enhance the surgical and management skills of the nurses, including admission and discharge procedures (including patient statistics, clinical notes, and completeness of medical investigation), sterilization and aseptic techniques, pre-operative preparation and post-operative care, management of general ocular emergencies, pre and post operative counseling.

The course was carried out based on the specialization program developed jointly by the GMEIPO staff and leading specialists of the Ophthalmology Chair of NIH. It provided both theoretical knowledge and practical skills on the contemporary methods of eye diseases prevention, diagnosis and treatment to nurses.

The training consisted of lectures, practical trainings, and group works and discussions.

Lectures were usually not more than 2 hours, with 15 min. break. They incorporated also exercises, brainstorming and rounds.

Practical trainings - 1 or 2 per day. The duration of each practical training was 2 hours, with 30 minute break. The practical trainings were conducted in different eye departments, dressing and operating rooms. During practical trainings, students were examining patients, performing diagnostic tests and clinical procedures, carrying patients under the control of course executors. Practical trainings also included night duties and practicles.

During night duties/shifts students together with the doctor on duty attended patients, examined them and conducted treating procedures. On the next day five minutes prior to the lecture students presented the activities performed on night duty (admitted patients, performed treatment/diagnostic procedures).

Group work was usually 2 hours long with 30-minute break. Group work and discussions were organized in the form of open discussions and rounds.

The trainees were provided with the necessary literature. The most important textbooks and readings were copied and distributed to students.

Course timetable

Overall duration of the course was 5 weeks. The detailed course syllabus with the covered topics is presented in Appendix I.

Course assessment and final exam

The last day of the training was allocated for the final exam. The trainees were allowed to sit for the examination after fulfilling the following requirements:

- Attendance
- Participation in practical trainings
- Participation in night duties/shifts

Evaluation and certification depended on the final grade, which itself comprised of the following:

- 50% of the final grade was based on practical skills testing exam.
- 50% - on theoretical knowledge exam.

Practical skills exam - The practical skills exam lasted 3 hours. Students independently examined patients and demonstrated their practical skills of eye examination, confirmation of a diagnosis, and treatment of revealed pathologies. The grade was based on a 5 point scale as assessed by the examination committee, consisted of the head of the Ophthalmology chair of NIH, the main executors of the course, and project organizers, with minimum passing being 3.

Theoretical skills exam - The exam questions were distributed to the trainees one week before the exam. The exam was oral based on question cards. The number of question cards was 20, each contained 5 questions. 30 minutes were given for preparation. The grade was based on 5 point scale system, as assessed by the examination committee, with minimum passing being 3.

The nurses from Sevan received a final grade equal to 5 points, and the nurse from Ijevan received a grade equal to 4 points. They all were given an official certificate on passing their professional training titled “Refresher Training of Eye Department and Cabinet Nurses”.

The members of the examination committee were satisfied with the students’ knowledge. The course executers observed and very much appreciated the nurses’ enthusiasm during the training course.

The trainees evaluated the course, highlighting its practical implications, overall organization, content of lectures, professionalism of the lecturer and relevance of the course to their expectations and professional needs. They also provided their recommendations on improvement of the course, such as having more practical exercises.

4.2. Training Program for Regional Ophthalmologists

Another component of the human resource development was training of core ophthalmologic staff. Thus, one ophthalmologist from Sevan ROU (Gegharkunik marz) and one ophthalmologist from Ijevan ROU (Tavush marz) were invited for a specialized training at the Ophthalmology Chair of the National Institute of Health (NIH). The JMF fully supported this component of the training (see Appendix VII).

Description of the course

The training started on October 4. Its duration was 7 weeks.

The course provided theoretical knowledge and practical skills on the contemporary methods of eye diseases prevention, diagnostics and treatment.

The course was carried out based on the specialization program developed jointly by the Meghrigian Eye Institute staff and leading specialists of the Ophthalmology Chair of NIH. The course was developed in Armenian, English, and Russian. The detailed course syllabus with the covered topics is presented in Appendix IV.

By the end of the training course the trainees were able to:

a. assimilate a complete course of contemporary ophthalmology

b. be master in contemporary methods of diagnosing and treating eye pathologies

c. be familiar to possess eye microsurgery

The training course consisted of lectures, practical trainings and group works, conducted in the Medical Center “Kanaker Zejtun” (8th Eye Clinic).

Lectures were usually not more than 2 hours, with 15 min. break. They incorporated also exercises, brainstorming and rounds.

Practical trainings - 1 or 2 per day. The length of each practical training was 2 hours, with 15 minute break. The practical trainings were held in different eye departments, dressing, and operating rooms. During the practical trainings, students examined patients, performed diagnostic tests and clinical procedures, and monitored patients under the control of course executors. Practical trainings also included night duties and practicals.

During night duties/shifts students, together with the doctor on duty, attended patients, examined them and conducted treatment procedures. On the next day five minutes prior to the lecture students presented the activities performed on night duty (admitted patients, performed treatment/diagnostic procedures).

Group work was usually 2 hours long with 15-minute break. Group work and discussions were organized in form of open discussions and rounds.

The trainees were provided with the necessary literature. The most important textbooks and readings were copied and distributed to them.

Course timetable and conceptual outline

The course included visual organ anatomy, physiology, refraction and optics, contemporary methods of eye examination, conservative and surgical treatment of eye pathologies. A detailed course timetable is presented in Appendix IV.

Testing

After each section, students were tested. Each trainee was given 10 multiple choice questions. Overall, the trainees passed 10 tests, duration of each was 10 minutes, and the grade was based on a 5 point scale as assessed by the examination committee, with minimum passing being 2.

By the end of the course an average final grade was given based on the results of the tests.

In addition, two final exams were held: one for testing theoretical knowledge and one for practical skills. The examination committee consisted of main executors of the course, head of the Ophthalmology chair of the NIH, and project organizers. The final grade was based on a 5 point scale as assessed by the course executors, with minimum passing being 3.

After passing the exam students were referred to the chair of Military Preparation for passing the short refresher course on organization of military ophthalmologic services and the emergency medical services.

Both students successfully completed the training, receiving final grades equal to 5, and they were awarded an official certificate titled “Advanced Methods of Eye Disease Diagnostics and Treatment”.

The trainees evaluated the course, highlighting its practical implications, overall organization, content of lectures, professionalism of the lecturer and relevance of the course to their expectations and professional needs.

4.3. Public Health Ophthalmology Training

The main aim of the public health ophthalmology training was to equip ophthalmic personnel of the selected marzes (Gegharkunik and Tavush) with knowledge and skills of eye care program design, evaluation, interpretation of available data on eye care and eye pathologies and critical assessment of existing services in their settings, as well as in other regions of Armenia.

The training started on March 14. Its duration was 12 days. The core course was based on the curriculum of Public Health Ophthalmology developed by AUA/GMEIPO staff. Three ophthalmic nurses and three ophthalmologists were invited for the training. Two nurses and two ophthalmologists were representatives of the Sevan ROU, one nurse and an

ophthalmologist were invited from Ijevan policlinic. The course was slightly modified and adapted to meet the learning requirements of the trainees. The JMF fully supported this component of the training (see Appendix VII).

Course description

The first part of the days, during the first week of the course (6 days), was allocated for the individual study and labs. The trainees were allowed to use the computers, internet, and the library at GMEIPO. In the afternoon students had lecture sessions, overall 3 lectures per day. The training day was completed by discussions, a short question/answer session, feedback and an evaluation.

During the second week of the training, the morning sessions were allocated for the team work, followed by formal lectures.

Guest speakers were invited to expose students to such important topics in public health ophthalmology as social aspects of blindness, eye care program evaluation and quality assurance.

Course timetable and outline

The first day of the training started from ice breaker rounds, where students introduced themselves, their backgrounds and what they expected from the course. The course organizers presented the course outline and rationale. The learning objectives of the course were discussed taking into consideration the student's expectations. The course importance was discussed in the aspect of its future practical implication. The course timetable with the main topics to be covered was presented to the students. They were explained that the course would not only review the basics of epidemiology and public health, but also would progress rapidly beyond that to specific community eye health issues.

Brainstorming on eye health issues in Armenia helped to value students experience and helped students transfer their existing knowledge of the situation in Armenia from their practice to give a new community perspective on the problems.

The first lecture started with the vision, mission and objectives of public health, and its services. The epidemiology was defined as the study of occurrence, distribution, determinants and control of disease in human population. The main definitions such as incidence, prevalence, exposure, risk factors were reminded [4]. The main patterns of eye diseases in different populations were described and the main types of eye surveys (eye disease survey, blindness survey and RACSS (Rapid Assessment of Cataract Surgical Services)) [5] were introduced.

After introducing to the students the basics of public health and epidemiology, the concept of Vision 2020 - the Right to Sight was presented in an interactive lecture format. Vision 2020 was described as the response of WHO and other international NGOs collaborating on an initiative to eliminate the avoidable blindness (responsible for 80% of all blindness) by the year 2020 [6-7]. Comparison of the eye health priorities in Armenia and the same as those of Vision 2020 were discussed with the group. Students were also asked to outline their potential role within this initiative.

The last session of the first day was a lecture on blindness. Along with presenting the definitions of blindness, its different classifications and grading were discussed and compared [8-9]. The theoretical material was consolidated by problem solving exercises (categorizing visual acuities, calculation of eye health problems in the community, etc.). Possible ways of blindness reduction were listed and discussed in the aspect of their possible application and acceptance in Armenia. The main blinding conditions and disease were introduced with a note that each of them would be discussed in details later on.

The second day of the training was devoted to introduction to health systems, organization of ophthalmologic services, sustainable eye care, and ways of financing . Cataract was discussed as the main blinding eye disease.

Before presenting the objectives of a health system, the holistic and organic definitions of health were discussed [10]. The main indicators of health, such as mortality, morbidity, life expectancy, disability and life quality were reminded.

Introduction to a health system was started from its definition and main objectives. Health was linked to the health system through the constituents of latter, such as population factors, system structure, components, inputs and quality assurance indicators. Description of the three main principles of the health system (equity, quality and cost-effectiveness) was followed by students' discussions on relevance of those principles to the existing health system in Armenia.

Different models of eye care systems and ophthalmologic services were discussed allowing students to make comparisons and highlight advantages and disadvantages of each model. After the discussion, the best models of eye care (Aravind Eye Hospital, LV Prasad Eye Institute) [11] which proved to be self sustainable were presented as examples. The basic components and elements of self sustainability and self financing mechanisms were introduced and explained. The topic was concluded by interactive discussion on reasons and factors stipulating the necessity of sustainability.

Course structure, in terms of preliminary acquaintance with the basics of epidemiology, public health and public health ophthalmology basic concepts, and its transition to more specific public health ophthalmology issues, such as blinding conditions, ensured better understanding and utilization of the presented materials.

Presentation of main blinding conditions and diseases started from cataract. Being one of the most frequent eye pathologies and the main cause of blindness [12] cataract can be considered as an indicator of ophthalmologic services, of their affordability, availability, accessibility and quality.

Different definitions of cataract blindness were presented. Its magnitude was assessed. Comparison of available data on cataract blindness from Armenia [13] and other parts of the world [8] showed its importance as a public health problem in Armenia and direct necessity of undertaking actions to tackle this problem. Cataract surgery indicators (efficiency, volume and capacity), cataract surgical rate and coverage, as well as outcomes of cataract surgery were discussed in details. Special attention was placed on discussion of barriers to cataract surgery and their possible underlying causes (quality, education, socio-economic situation, etc.). Students brainstormed on ways of improving cataract services, after which the lecturer presented examples from other countries succeeded in this area by improving outcome, output, reducing costs, etc. [14-15].

During the following 2 days students continued studying public health aspects of other blinding diseases, such as glaucoma, diabetic retinopathy, eye infections and childhood blindness.

Glaucoma's and diabetic retinopathy's definition, classifications, magnitude and risk factors [12, 16], as well as control and treatment measures of the chronic forms of the disease were presented in details to the trainees, supported by available statistical data from Armenia and other countries.

Public health approaches to the following eye infections were studied: HIV/AIDS, toxoplasmosis and infective keratitis. Their magnitude, control measures and clinical features were discussed [12]. Students were asked to prepare the description of the discussed

infections in Armenia, to choose control measures and to assess their practical implications for Armenia.

A separate lecture was devoted to the problem of childhood blindness and its social and economic implications. The students were explained the importance of study of such eye problems as refractive errors and/or retinopathy of prematurity. It was stressed that not only the actual number of children affected should be considered as a measure of magnitude of the problem, but also the estimated number of blind years, with their social and economic consequences to individuals, families and communities [8].

The fifth day of the training started with a quiz. A multiple choice exam was designed to test understanding of the lecture material and the exercises covered in group work. The facilitator provided additional feedback the next day, and discussed the gaps in students' knowledge.

Beginning on day 5, the course shifted focus from theory of community eye health to its practical implications. Students gained experience in each steps necessary to create a community eye health program from data collection through planning and budgeting to presentation.

As a first step of shift from theoretical to practical knowledge and skills, the students learned the importance of a team work in achieving the common goals and set objectives. Team structure, its characteristics, advantages and difficulties, ways of overcoming those difficulties were discussed using interactive lecture technique. The students presented their point of view of a work in teams, and the role of the team leader. The lecturer, with the help of students, highlighted the main hints of an effective team work.

The students were divided into two teams, each team consisting from three members. The teams were structured in a way to have representatives from each target marz (Gegharkunik and Tavush). It was anticipated from the students that they would conduct a community eye

care needs assessment, critically appraise and select appropriate control strategies for the selected blinding condition and as a result produce an eye care program. To develop the eye care program, the students were expected to apply such experiential method, as fieldwork and interviews.

The trainees were provided a list of topics from which each team selected one topic. One of the teams selected “eye health education” and the other “community outreach work”.

The next training days were organized in a way to cover the practical and theoretical skills required to develop an eye care program. The first topic was health planning.

The main foci of the lecture on health planning were the rationale for planning, its main types (activity and allocative), basis for and approaches to planning, and the main steps of planning process [17]. Importance of developing a “planning culture” for success was stressed.

Students were taught that situational analysis, which is the first step of the planning model, allowed selecting priority areas of concern for planning. It also provided a basis for the rest of the planning process.

Needs assessment, using RACSS (Rapid Assessment of Cataract Surgical Services) methodology, in Gegharkunik marz of Armenia in November 2003 by the GMEIPO staff, was presented as an illustrative example of a situational analysis [13]. The objectives of needs assessment, its methodology, results and recommendations were discussed in details allowing students to draw conclusions on its rationale, advantages and limitations.

Day six was devoted to the study of transferable skills, such as presentation and grant writing techniques. The importance of study of these techniques was highlighted by the course organizers in terms of their practical usefulness as tools to fulfill the course assignment, and also as useful techniques frequently used during work practice.

The sixth training day was followed by a lunch out together. This event gave an opportunity for the trainees and course executors to socialize with each other in an informal environment.

The seventh day was allocated for rest, as well as for individual readings, and rehearsal of already covered topics.

On Day 8, students had fieldwork. Due to limited resources, the trainees could not visit the regions for obtaining necessary data. However, GMEIPO staff provided them with the following available data: population of the selected region, number of practicing ophthalmologists, number of surgeries performed per year, currently available programs, and other statistical data. Based on the provided data, the students started outlining their written assignment, namely developing an eye care program.

On the following day, study of practical aspects of the program design was continued including basics of management, evaluation and quality assurance.

Introduction to eye care program management started from discussion of differences between programs and projects. The definition of programs and projects, as well as different definitions of management were provided. The importance of program management was highlighted as an aid in maximizing and optimizing available resources to accomplish set of goals and objectives.

Advantages and ways to better manage were explained to the trainees. The fundamental role of effective leadership and management in achieving high quality, large volume and sustainable eye care was highlighted and supported by examples from different international eye centers [11].

The lecturer also presented consequences of improper management, such as delays, extra costs, waste of resources, low quality, dissatisfaction and decrease of reputation.

The logical flow of the lecture on eye care program management was continued by discussion of the basics of financial management [20]. Types of financial plans, specifications and components of each presented plan, as well as issues of financial reporting were provided to the trainees. The lecturer with the help of the students developed an example of a summary budget, which helped in better utilization of the presented theoretical material.

The lecture on program evaluation was prioritized both by the course organizers and the trainees. A guest lecturer was invited to deliver this lecture. Varduhi Petrosyan, MS, PhD, associate professor from the College of Health Sciences, AUA, presented the core concepts of program evaluation. The main objectives, stages, levels, types and scope of the program evaluation were discussed. Dr. Petrosyan provided information on situations where the evaluation should be applied, what kind of difficulties could be anticipated, how to formulate the evaluation question and what were the standards and units of evaluation. Basics of sampling issues and design methodology were also reviewed during the lecture. The theoretical material was consolidated by examples from different projects conducted by CHSR/AUA. The students had an opportunity to discuss the specific questions related to their written assignments.

Another guest lecturer was invited to present the concept of quality assurance. Anahit Demirchyan, MD, MPH, Senior Program Manager, CHSR/AUA, discussed the example of American University of Armenia and Nork Marash Medical Center (NMMC) Collaborative project, one component of which was a quality assurance. Dr. Demirchyan described the components of quality and the circle of its assurance in the field of health care [21]. Based on the lessons gained during the implementation of the quality assurance subproject at NMMC, she provided practical recommendations for setting up a quality assurance system in eye care.

The last day of formal lectures was devoted to such important topics for the organization of sustainable and high quality ophthalmic services as service marketing, resources utilization

eye health education and outreach work. The last day was dedicated to outreach, financial management and program evaluation

Service marketing was discussed from three perspectives: community perspective, program perspective and sustainability perspective, and as the main driving force in resource utilization. For better understanding of service marketing in eye care the trainees were provided with the basic marketing concepts and concept of market driving (market development). The lecturer supported the material with service marketing exercises and examples of market development in other countries [11]. Factors that generate demand were presented in the following perspectives: availability, accessibility, affordability, attitude and quality issues.

The lecture presented social marketing as one of the important constituents of service marketing. The information on benefits of social marketing, its main strategies and its importance in the field of eye care was discussed. Students were asked to give a list of indicators of successful social marketing. Thereafter, the lecturer compared the list provided by students with the accepted list of indicators [22].

Given the time constraints and time limitation of the course, the course executors presented the main conceptual structure of eye health education, tackling the basic practical aspects. Advantages and disadvantages of all three approaches used in eye health education, namely personal, group and mass, as well as main methodologies were described by the lecturer. Students were asked to give examples of each method [22].

Outreach work was discussed on the examples of world wide known centers providing outreach services, such as Aravind and L.V. Prasad hospitals in India, and Lumbini hospital in Nepal [22]. The rational of the outreach work, as an initiative “to reach unreached” was presented. Objectives of outreach work (community service, community involvement, eye

care education, social marketing, demand generation, staff training and development) were discussed in two dimensions: self-serving and altruistic. Examples of each type of community work/activities were presented [11]. The lecturer with the help of students provided organizational and logistic issues, preparatory activities of mass screening camps, and mass screenings in schools.

One day was given for preparation and completion of the course written assignment. Equipped with necessary knowledge and skills, the trainees approached to fulfillment of one of the course requirements. The students were asked to create an action plan for a community eye health program. The written assignment should not exceed 2500 words and should include the following components:

- Introduction – needs assessment
- Rationale – situational analysis
- Overall objectives and goals
- Specific objectives
- Implementation strategies
- Timetable and summary budget (not included in word count)
- References

On the last day of the training, the students made presentations of the eye care programs developed in the groups, as a part of the course requirement. Although the whole group developed the eye care program, each student was asked to present one component. Course organizers graded the course using the presentation score sheet [23], which contained the following main fields: content, organization, style, use of visual aids, time utilization, questioning, and overall impression. The grading scale for each of the mentioned fields was the following: 4 – excellent/exceptional, 3 – good/fully met, 2 – fair/partially met, and 1 – poor/not met or missed.

Each presentation was followed by a question answer session. The students received peer and facilitators' feedback.

After the presentations, the students evaluated the course using specially developed evaluation form (see Appendix VIII), which assessed the course in terms of its relevance to students' professional needs, and to student's expectations, its overall organization, professionalism of course executors, and overall assessment of practical trainings.

Based on the recommendations, suggestions and comments, made both by course facilitators and their colleges, the students revised the group write-up and submitted the final written product by the end of the next working day.

All students fulfilled the course requirements and received certificates on completion.

Course assessment

The final grade of each student was composed of the following:

Participation – 10% of the grade. Each student's contribution to the class and group work and participation in the fieldwork was assessed by attendance, timeliness, and participation in group discussions, aiming to motivate students to be more active during the course.

Quiz – 30% of the grade. An open ended exam on day 5 tested understanding of the lecture material and the exercises covered in group work. Students were asked to grade each other to increase their learning of the subject. They learned what went wrong with their answers. The facilitator provided additional feedback on the next day, and discussed the gaps in students' knowledge.

Presentation – 10% of the grade. Students were asked to work in groups of three to develop an eye care program for a selected marz or region of Armenia and to present their eye care programs on the last day of the course. The presentations were followed by question and

answer sessions. Good presentation skills were needed to be able to "sell" a proposal. Students also had an opportunity to learn form each other's performances.

Group write-up – 50% of the grade. A written outline of the group's eye care program proposal was submitted. This assignment developed grant-writing skills, advance knowledge of needs assessment, resource mobilization, management and evaluation of eye care programs and increased students' ability to select appropriate control strategies for the selected blinding disease or condition. This paper could be of particular relevance to those students already working or planning to work in district/regional level of eye care and could provide a good basis for a proposal to a donor organization.

4.4. A two-day training of the VEC nurses

In the framework of the village examination centers (VEC) development subcomponent of the project (detailed description of this subcomponent will be presented in the report on Community-based referral system development), a training of VEC nurses was organized.

The training was carried out by the Meghrigian Eye Institute ophthalmic personnel of the American University of Armenia (AUA). It was fully covered by the JMF's kind contribution.

Rationale

The aim of the training was to improve the knowledge and practical skills of the primary eye care personnel in marzes and increase the VEC nurses involvement in the blindness prevention activities.

Course description

Two training sessions were conducted: one for nurses invited from Gegharkunik marz and one invited from Tavush marz. The trainings were carried out in selected regional policlinics. In Tavush marz, Ijevan policlinic was selected and in Gegharkunik marz - Sevan policlinic.

After selection of villages, the nurses were recruited and invited for training. Overall 20 nurses from different villages participated in the training.

The course was carried out by GMEIPO ophthalmologists following training curricula developed based on the WHO primary eye care guidelines (see also Chapter 3.4.)

The following topics were covered during the course:

- Visual organ anatomy and physiology
- Main eye diseases
- Eye diseases early diagnostics
- Eye care services in Armenia
- Role of primary eye care personnel in blindness prevention

In addition to theoretical part, the practical skills were also demonstrated. By the end of the training the nurses should perform the following activities by their own:

- Visometry
- Palpator tonometry
- Visual field testing
- Corneal sensitivity test
- Eye drops instillation
- Application of eye ointments
- Application of eye bandages
- Conjunctival sac washing

Teaching methodology

During the training course the nurses were acquainted with the basics of ophthalmology and learned practical skills to detect eye diseases in early stages of development. This part was presented by means of lectures and interactive sessions. Different visual aids (color atlases, charts, etc.) were used to assist the learning process.

Lectures were followed by practicals, during which the GMEIPO ophthalmologists explained and demonstrated practical skills. Thereafter, the nurses, under the supervision of

ophthalmologists, practiced skills on each other (e.g. measured visual acuity by visual charts, performed palpator tonometry, confrontation field test, etc.).

All nurses were provided with brochures on basics of ophthalmology, developed by GMEIPO ophthalmic personnel. They were also provided with basic ophthalmic equipment, drugs and supplies necessary for primary eye care. The list of donated equipment and drugs is presented in Appendix XI.

Due to kind contribution of the United Nations High Commissioner for Refugees office in Armenia, the project implementers were able to donate to each examination center ~ 40 high quality eye glasses, mostly for correction of presbyopia, which is a frequent problem in people aged 45 and above.

Limitations - The training was organized in December. Bad weather and snowy roads resulted in absenteeism in Tavush marz. Some of the nurses did not attend the training due to seasonal factors. Those, who could not come for the training, were later trained by the GMEIPO ophthalmic consultants in Ijevan policlinic.

The rapid assessment test held on the second day of the course revealed that the knowledge and practical skills of VEC nurses improved.

After receiving the training the village nurses will routinely provide basic eye screenings for all individuals applying for ophthalmic help. They will identify people with low vision and other problems and refer them directly to the respective ophthalmic institutions or specialists.

5.0 TRAINING AT LIONS ARAVIND INSTITUTE OF COMMUNITY OPHTHALMOLOGY

5.1 Short term courses in IOL Microsurgery and Small Incision Cataract Surgery

In the scope of the project one ophthalmic surgeon was sent to Aravind to pass a short term course on IOL microsurgery at Lions Institute of Community Ophthalmology (LAICO).

The ophthalmic surgeon, selected based on his experience, was considered as a leading specialist in Kanaker-Zeytun medical union. The high number and quality of cataract surgeries, as well as low rate of post op complications were the main criteria for selecting him as a surgeon for the Ophthalmic Unit being established in Sevan, Gegharkunik marz.

However, to acquire knowledge and skills on advanced methodology of cataract surgery allowing to increase the volume of surgeries, thus to tackle the problem of blindness more effectively, he was sent to LAICO. This was necessary as the available training centers in Armenia do not have the infrastructure and capability to train the ophthalmic residents in the advanced methods of cataract surgery.

The LAICO was chosen as the best training site given the number of characteristics, among which were [24]:

- its collaboration with WHO;
- having established microsurgery training center to provide a structured and high quality training for Extra capsular cataract extraction with Intra ocular lens insertion;
- having the necessary infrastructure and an excellent microsurgery facilities for providing intense training to ophthalmologists (35 operating tables, over 25 operating

microscopes, 12 operating rooms equipped with video cameras, high load of cataract patients, well trained and experienced surgeons, etc.);

- its commitment to train ophthalmologist in IOL microsurgery so that it can eventually reach the poor people and possibly eliminate blindness due to cataract;
- being a place that converts a traditional surgeon into a confident surgeon which is able to properly assess cases preoperatively and is also capable of managing postoperative complications.

Based on the high volume of previous cataract surgeries of the candidate, the course was specially adjusted to allow maximum efficient use of the training time. The first month of the training was spent to consolidate the existing knowledge and skills on IOL microsurgery and to expose to its new methodologies. The second half of the course was devoted to Small Incision cataract surgery.

Rationale

The training started on November 1, 2004. Its duration was two months.

The training was very intensive, even hectic as assessed by most of the trainees. The typical training day was run as follows:

Duration: 7:00 am to 6:30 pm with 1.5 hour lunch break.

Hands on surgical exposure: 3 hours per day

A stepped surgery module was a main training framework, during which the surgeon was anticipated to become proficient in each stage before moving on to the next stage.

The previous surgical experience of the candidate was taken into account by the course organizers and he was enrolled into a higher module directly.

Table 1 shows the daily surgical schedule for the candidate:

Table 1. Number of cases for training per day

1st week	:	No live surgery
2nd week (Stepped surgery)	:	2 ECCE - IOL
3rd week (Stepped independent)	:	2 ECCE - IOL
4th to 8th week (Independent)	:	3 ECCE - IOL

1st week – spent on building up the theoretical knowledge to a desired level, preoperative and postoperative evaluation of patients, and managing post op complications.

2nd week – consolidating technique of different steps of ECCE in a stepped fashion, performing 2 ECCE in a stepped fashion and one ICCE.

3rd week – performing all the steps of ECCE under supervision. One-to-one ration between the trainee and the instructor was always maintained.

4th week and onwards - operating independently, getting acquainted with the technique of Small Incision Cataract Surgery (SICC), performing SICCs under supervision, and then independently.

Course description

Objectives - The main objective of the course was to equip the surgeon with skills and knowledge on advanced methods of cataract surgery which would enable him to carry a high quality cataract surgery when he returns to his own practice.

Learning outcomes - It was anticipated that by the end of the course the trainee would acquire surgical skills, clinical skills and theoretical knowledge. Moreover, training in each surgical technique would allow him to manage the complications comfortably/confidently.

By the end of the course the surgeon had performed a total of 65 surgical cases, out of which at 60 cases were performed independently. In addition to the surgical cases, the surgeon had examined 60 cases with keratometer, 500 cases with the slit-lamp and witnesses at least 10 patients undergoing YAG capsulotomy.

The surgeon got an opportunity to observe the Facoemulsification training.

Conceptual outline – During the training the following main topics were covered:

- Operating microscope and basics of microsurgery
- Relevant anatomical facts for cataract surgery
- Instrumentation for IOL surgery
- Preoperative evaluation, ocular examination and anesthesia for cataract surgery
- ECCE[1] vs ICCE[2] – a view in perspective
- Extracapsular cataract extraction/ECCE
- Optical correction of aphakia
- Intraocular lens – evolution, design and current preferences
- IOL power calculation
- Viscoelastics
- Anterior segment complications after ECCE with IOL and their management
- Posterior segment complications of IOL implantation
- IOL in difficult situations
- Pediatric cataract – etiology, evaluation and management
- Secondary IOL implantation
- Scleral tunnel with manual Phaco
- Recent advances in IOL
- Social marketing for effective eye care delivery
- Community outreach programs – Aravind Eye Hospital

From the list of topics it can be seen that the foci were not only on acquiring surgical skills, clinical skills and theoretical knowledge, but also on basics of hospital management and community ophthalmology.

[1] ECCE – extra capsular cataract extraction
[2] ICCE – intra capsular cataract extraction

The candidate also attended two eye camps and this helped him to understand elaborate and extensive community programs.

Facilities

The trainees spent their time in well equipped classrooms and auditorium with necessary teaching aids. They were allowed to use the Resource center with its collection of books on Medical Sciences, and Management and Hospital Administration. The Computer centre and the Students study centre were at students' disposal.

Teaching methodology

Training consisted of formal lectures followed by discussions, and intensive practical trainings both in examination rooms and in operating theater with an emphasis on contemporary methods of cataract surgery, and ward rounds.

Another component of teaching methodology was based on evaluation of surgical performances. Besides observing live surgeries, the surgeon was provided with videocassettes of surgeries. This gave him opportunity to watch others surgeries and to assess their methodology.

Assessment of the course

As soon as the surgeon joined the course a log book was given to him, where he recorded his daily activities and gave to the instructor to sign on a daily basis. At the end of each training day, the surgeon had a meeting with the course coordinator during which their daily performance was assessed, the problems were discussed and constructive suggestions were offered.

After completion of the course a certificate on completion of the "Short Term IOL Microsurgery and Small Incision Cataract Surgery Course" was awarded to the ophthalmic surgeon of the project.

5.2 Certificate Course on Clinical and Supervisory Skills Development of the Ophthalmic Paramedical Personnel

Important component of building a sustainable eye care services was the training of mid level ophthalmic personnel. After passing one month specialization program in Ophthalmology at the National Institute of Health, two nurses were sent to Aravind to perfection their ophthalmic, ophthalmosurgical and management skills.

Rationale

The course was designed to provide knowledge and skills in functional areas such as serialization, general anesthesia, pre- and post operative counseling, refraction and other eye disease diagnostics techniques, equipment maintenance, etc [24].

The course started on October 1, 2005. Its duration was 3 months.

One of the nurses enrolled in **Group 1:** Out Patient and Refraction, and the other in **Group 2:** Operation Theatre and Ward.

Objectives and Learning outcomes

At the end of the course the participants would be able to:

- Enhance the clinical skills to support ophthalmologist in patient care;
- Improve the workflow to support cost effective eye care services, for enhanced patient satisfaction and staff performance;
- Promote patient centered care with continuous quality improvement;
- Carry out daily planning and scheduling of work;
- Able to perform routine maintenance of equipment and instruments by understanding the need and importance of equipment in eye care;

- Apply scientific management practices in supervising a department / unit by understanding and appraising the role and functions of a supervisor;
- Improve supervisory skills in communication, delegation, problem solving, time management, team work, planning and effective counseling.

Conceptual Outline

Before starting their training in pre-selected groups of Out Patient and Refraction, or Operating Theatre and Ward, the nurses underwent 15 days of general orientation. They had theory classes in anatomy and physiology of the eye, common eye diseases, cataract and its management, diseases of cornea, retina, orbit, uvea and their management, and glaucoma and its management.

After the general orientation, the candidates started their specialization training.

The main clinical skills practiced in the **Group 1:** Out Patient and Refraction were:

- Visual acuity
- Eye diagnostics (assisting in gonioscopy, tension applanation, corneal staining, field examination, retinoscopy)
- Geometrical optics
- Observation of preliminary and final examination
- Preliminary investigation
- Patient counseling
- Assisting for ophthalmologists in slit lamp examination
- Observation in specialty clinics - cornea, glaucoma and pediatric ophthalmic services
- Ocular motility and strabismus
- Optical dispensing and counseling
- Lens neutralization
- Muscle balance
- P. G. power examination
- Pin hole vision
- Management of systemic diseases

The main clinical skills practiced in the **Group 2:** Operating Theatre and Ward were:

- Observation of local anesthesia and operating theater
- Block practice
- Sterilization
- Setting-up equipment trolleys
- Observation of Scrub nurse in all theatres
- Observation in wards
- Admission and discharge procedures
- Pre-operative preparation
- Post-operative care
- Management of general ocular emergencies
- Pre and Post operative counseling
- ICU care and management and Management of systemic diseases
- Aseptic techniques

The common clinical skills for both groups were equipment in terms of its purpose, maintenance, proper usage and scheduling, general cleanliness, planning and coordinating of resources and facilities, and medication, in particular pharmacology, safe medication practice, and correct explanation of usage technique.

Also both groups were exposed to different areas of supervisory skills, such as:

- patient satisfaction (patient satisfaction survey, waiting time, communication skills, patient counseling, and customer service),
- documentation (patient statistics, pre operative and post operative notes, discharge summary, completeness of medical investigation),
- managing the staff (interpersonal relationships, leadership, problem solving, conflict management, team work, communication skills, time management and delegation),
- planning and scheduling (forecast of expected number of patients, staff scheduling / posting, planning of supplies, patient load management).

Exposure to different outreach activities was considered as an essential part of the training.

Each nurse was sent for 2 day camps, after which each of them presented a written camp report. In addition, they were sent to Theni hospital for one day to observe the work of the outreach hospital.

Through outreach exposure they were able to get an idea about organizing camps, the activities in the camp, the patient flow coordination and maintenance in camps.

Facilities

The theory classes were conducted in modern and well equipped classrooms and auditoriums. Resource center with wide variety books and computer center were under students' disposal. Practical trainings were organized in different operating departments, diagnostic rooms and wards.

Teaching Methodology

Teaching comprised a combination of didactic lectures by faculty and healthcare professionals, case studies, seminars, debates and discussions. Each subject was planned in a way that the students were kept occupied with mini projects, filed visits and practical trainings.

Assessment of the Course

The assessment was done based on assignments, class participation and tests. At the end of the training course, the nurses passed a final oral examination. Another requirement was a presentation of the results of a case-study.

Both nurses were awarded certificates titled "Clinical and Supervisory Skills Development in Ophthalmic Paramedical Personnel".

Course assessment by the trainees

According to the nurse applied for Group 1: Refraction and Out Patient, the course was very intensive and its effectiveness would be higher if she had previous experience in the ophthalmic field. Refraction was a completely new field for her. Practicals, lectures and guidance of the faculty during the training helped her to overcome the difficulties. At the end of the training she could do the refraction confidently. The nurse found very interesting observing refraction tests of stereoscopic vision. She mastered her skills in doing Hess charting, pachymetry, corneal topography, corneal scraping for cultural tests, and number of other techniques most of them new for her.

The nurse applied for Group 2: Operation Theater and Ward, assessed the course in terms of its practical importance. The most important skills mastered by her were:

- Pre and Postoperative preparation and care of the patient;
- Bandaging the eye and untying the bandage;
- Pad cutting in an economical way, without wasting the materials. Bed making;
- Sterilization techniques;
- Listing the names of Operation Theatre equipment and trolley set-up;
- Maintenance in operating theatre;
- Theatre cleaning procedures;
- Scheduling and staffing in theatre.

Overall, both nurses were very much satisfied about the training program.

Difficulties/limitations

Despite all the positive remarks and overall satisfaction, there were several limitations [25].

One and the most important limitation was the language barrier. Both nurses had a very basic knowledge of English. Especially knowledge of the language was important during studying supervisory and management skills. Without good knowledge of English understanding of such concepts as patient counseling, patient satisfaction, interpersonal relationship and

complaint handling was very difficult, as assessed by the nurses. The handouts brought by them were very informative and could be used for the future.

Another important obstacle for the training was a lack of experience in the filed of eye care and being new to some of the specialty areas in ophthalmic field. Both nurses passed a one month specialization program in ophthalmology at the National Institute of Health, RA, but it was not enough to give them necessary knowledge and skills.

However, despite these limitations, the course's overall effectiveness was very high and the nurses returned to Armenia not only with gained knowledge and mastered practical skills, but also with high level of motivation and devoutness to the work in the Regional Ophthalmic Unit.

5.3. Management Training for Eye Care Program Managers

At present, the majority of eye care program mangers, as well as eye hospital/units mangers in Armenia are lacking managerial training. Although there are institutions that train professionals in management and program management in general, there is no institute in the Region, which provides eye care program management training on a regular ongoing basis.

Given the emerging need for the country and for the LCIF SightFirst project, the GMEIPO/AUA Program Manager, currently the Principle Investigator, was sent for the Management Training for Eye Care Program Managers at LAICO, Aravind, to learn managerial approaches particularly applicable to eye care. It was planned that upon return from the course, she will be a trainer for the abovementioned topic. Moreover, the knowledge and experience gained during the course was expected to contribute to the development of the Lions Regional Ophthalmic Unit of Sevan. GMEIPO in-kind contribution fully covered this component of the training.

Course Description

Aim - The aim of the course was to enable the participants to acquire knowledge, skills and attitude to become effective in the eye care program management.

Constituency - The training course was intended for professionals concerned with eye care program development, planning, implementation, monitoring, evaluation and funding. It was of specific interest to the following groups:

- National Program Coordinators in eye care/blindness program from developing countries;

- National and State/Provincial level Program Officers in eye care;

- Program Managers/Program Officers of International Agencies in eye care;

- Senior Managers of Funding Agencies responsible for funding & monitoring the programs;

- Managers/Officers responsible for executing eye care programs.

Rationale - The course was intensive. Its duration was 2 weeks. Given the limited number of specialists in this particular area, the course is run once a year on a regular basis. Overall, 30 participants were in attendance. It is run for the developing countries, but mainly focuses on East Asia. The majority of the participants were from India, Bangladesh, Tibet, Afghanistan, Cambodia, and African countries. The participant were presented from variety of backgrounds, some had managerial position and were interested to learn about Aravind as a business system, some worked for PBl NGOs (Seva, Sight Savers, Orbis, CBM, Fred Hollows, Serve), some were ophthalmologists, involved in various blindness prevention programs or managing eye care units. This variety of backgrounds created a very interesting information exchange to the mutual benefits of the participants. The course was conducted in

English. All the participants were given the internationally recognized certificate, since LAICO is WHO collaborative center.

Facilities - The course was held at Lions Aravind Institute of Community Ophthalmology (LAICO), Aravind Eye Care System, Madurai.

Conceptual Outline - The course covered the following main topics:

- Project Development: Needs Assessment, Vision 2020, Prioritization, Strategy Evaluation, Core Concepts in Eye Care, Proposal writing and budgeting;
- Implementation: Planning, Benchmarking & Indicator Development, Service Marketing & Demand Generation, Project Management, Networking & Alliances, Management of Change, Funding & Financial Management;
- Monitoring: MIS & Reporting, Monitoring & Evaluation, Managerial Skills, TQM as a problem solving tool.

Week I - Assessment & Planning Module

- VISION 2020
- Needs Assessment, Magnitude of Blindness
- Planning
- Priority Setting
- Core concepts in Eye Care (Quality, Service Marketing, Sustainability)
- Comprehensive Eye Care Services
- Disease understanding (Basic understanding, Magnitude, Barriers, Service provisions etc.)

Group work presentation I- Project/Program Development

Week II - Management & Implementation Module

- Program/ Project development
- Project/Program Management
- Financial Management
- Monitoring ,Evaluation, MIS

- TQM as a problem solving tool
- Change Management
- Networking and Alliances
- Managerial Skills

Group work presentation II- Project/Program Management

Teaching methodology -During the course a variety of teaching methods was used, including lectures in the format of oral speech, PPT, video shows; and group work, including brainstorming, open discussions, games, exercises, project work.

Each teaching day would start at 9 am, with 15-min participants' reflection on the previous day. Then, the course organizer would briefly present the main goals and learning objectives of the day. Overall, each day will consist of four sessions, two - morning and two - afternoon, each lasting 1.5 hours.

Mainly LAICO faculty delivered the course. However, six guest lectures were invited, including representatives of WHO PBL, SEVA, Kaiser Permanente, IAPB, Vision2020 India and others. Among the lecturers were Suzane Gilbert (Director, Sight Program Seva Foundation), D. Najarajan (Consultant to Aravind Eye Hospital and LV Prasad Eye Institute), N.Murthy (Faculty, Harward School of Public Health), R.Pararajasegaram (Consultant, WHO PBL), S. Miller (Vice President, Kaizer Permanente in Honolulu), G. Shanmuganathan (Head, Accounts Training Institute in Banglore). Given that some of the participants were already experienced eye care program managers, they were encouraged to deliver lectures.

The course organizers provided very well organized workshop materials, which included course description, lectures handouts, tasks, and exercises. Particularly important was that they provided hard copies of the most important readings relevant to the course.

Exercises were very useful, done in the group and then discussed with other participants. Participants were provided with an opportunity to observe the Aravind system, including the

main hospital in Madurai. In addition, participants attended the rural model eye hospital in Theni. Interesting cultural program was organized to let participants to socialize and know each other, which is important for networking and establishing collaborations and partnership.

Assessment of the course - Students were provided with a Certificate of completion after fulfilling the following requirements:

- attend the entire course of the training;
- actively participate in class discussions, practical trainings, and exercises;
- participate in a group work to develop an eye care program.

Course evaluation- On the last day of the training, the participants presented the eye care programs developed in the groups. After the presentations, the participants evaluated the course using LAICO's evaluation form, which assessed the course in terms of how well the course meet the expectation of the student, degree to which course met its stated objectives, quality of the presentations and reading materials, effectiveness of learning methods, course length, relevance of the course to the participant's current/future work, overall effectiveness of the course facilitators.

Strength of the course

- The course was relevant to the participant needs, since the majority of them were eye care program managers.
- The most important issues of eye care programming were tackled during the course, such as planning, implementation, monitoring, and evaluation.
- Participants were provided with good selection of reading materials, relevant to the topic and updated.
- Interesting exercises and real life case studies were built into the lectures/group work.

- The course was delivered by LAICO leading faculty; well-known specialist in the field were invited as guest lecturers.
- Wide range of topics was suggested to the participants for written assignment. Faculty was ready to accept or modify suggested topics based on the participants' needs. Individual project work was also allowed.
- Participants were provided with a chance to observe Aravind system.
- The course provided excellent opportunities to establish contacts and networking.

Weaknesses of the course

- There was a large variety of the participants' backgrounds, some with little knowledge of the field, others- already professionals. Although useful for exchange of experience, this created inadequate contribution of the participants to the group work.
- More info on human resources management could be included in the content of the course, such as lines of authority, accountability, empowerment, delegation, staff evaluation, conflict resolution, etc.
- It would be very useful if more information on finical management, including basics of computerized accounting systems, were covered during the course.
- Given that the course was designed for the program managers, the knowledge of SWAT and 7-S analysis to identify the weaknesses and strength of organization was essential. Unfortunately organizational analysis was not covered by the course.
- It was highly recommended by all participants to improve access to computer facilities at LAICO.

Consequently, she has an opportunity to apply knowledge gained at LAICO to the process with wider implications to the country.

6.0. CONCLUSIONS/RECOMMENDATIONS

One of the main objectives of the project was human resource development for prevention of blindness in Gegharkunik marz. Human Resource Development is an important constituent for establishment of sustainable services and for having high volume, patient centered, high quality and cost effective eye care.

Overall, the training was successful and useful. All trainees assessed it as important, justifying their assessment by the fact that opportunities for receiving professional trainings/refresher courses are limited, especially for specialists from regions, because of lack of resources and insolvency. Moreover, there is no ophthalmic nurse specialization course at NIH.

The project organizers and the donor representatives noted the practical importance of all trainings also in terms of the following purposes: transfer of up-dated knowledge and experience exchange, as well as capacity building on the secondary eye care level.

Sharing the knowledge and exchange of experience with ophthalmic personnel, working in other regional health institutions, will create a network of specialists, and will establish links between different levels of ophthalmologic services, thus contributing to blindness reduction in remote and underserved regions.

Team work and good communication during the implementation of the project will contribute to further cooperation of the ROU specialists. Established network of different level ophthalmic personnel is an important prerequisite for capacity building for prevention of blindness.

Having trained specialists, especially those trained in advanced technologies will contribute to timely diagnostics and treatment of cataract patients.

Training the specialists will have far reaching implications for not only reducing the number of eye pathologies, but also for increasing the quality of cataract surgery in Gegharkunik marz.

This in its turn is a strong driving force and will motivate patients to apply for services in the stage when the chances for good outcomes are high.

In case of higher volume of patient flow, the second ophthalmologist of the ROU will be trained as an ophthalmic surgeon to support the ROU operations.

Training of the specialists in the LAICO, besides equipping them with updated knowledge and skills, helped them to understand the need and importance of cost effective sustainable eye care and the importance of their role in its establishment. Exposure to community eye health issues and outreach activities will play a significant role in ensuring adequate workload of the ROU in Sevan and organizing outreach services for the population of Gegharkunik marz.

It is planned to enrich already developed PHO curriculum with details from the course and to develop a new course for eye hospitals/clinics managers using the course materials, publications based on Aravind Eye Care System, and Aravind developed EYESITE WebPages.

Management training at LAICO will contribute the systems/procedures development for Sevan ROU. Moreover, the course materials will be used for development of the primary and secondary eye care projects throughout the country.

Active participation of VEC nurses and their interest proved the importance of eye care training courses for the primary care personal. Thus, to improve the quality of eye care provided by the primary care personnel in marzes the training courses should be organized repeatedly and the duration of the course be longer.

There is a need to establish a new model of eye care delivery for disadvantage population in Gegharkunik marz. Aravind Eye Care System could be a good example. Given the limited resources in eye care in Armenia, it is of particular importance to use cost-effective methods of management of already on-going programs and plan for new ones. If not completely applicable to the Armenian context, Aravind managerial approaches could be used for eye care delivery in rural areas of Armenia.

Consequently, human resource development through training of the core ophthalmic personnel will further contribute to combating the problem of blindness by strengthening local capacity, which is a strong base for sustainable development.

As a result, the ROU will become a model of affordable, high quality eye care performing high number of sight-restoring surgeries, and thus combating effectively the problem of avoidable blindness.

7.0. PLANS FOR FUTURE ACTIONS

During the second year of the project series of interrelated tasks aimed at infrastructure building were either accomplished, in the process or planned for the near future. Among those activities were renovation of the ROU facilities, procurement of equipment, furniture, supplies and materials, development of standard systems/procedures, and community-based referral system development/demand generation.

7.1. Establishment of the Regional Ophthalmic Unit

The ROU was renovated according to the construction norms, rules and regulations of the RA.

The list of necessary equipment was defined based on the WHO standard list. The same was done for the supplies and materials. The equipment includes diagnostic equipment, surgical equipment, instruments and sterilizing system. Sources of inexpensive high quality IOLs and supplies will be considered to choose the best option allowing to decrease a per patient cost of a surgery.

For the equipment, international suppliers were considered; from which a company presented the best cost for quality was selected. The furniture items and quantities were defined and matched with the building plan and design.

7.2. Standard Systems/Procedures Development

Operational Procedures

In parallel with the facilities renovation, procurement of equipment, standardized working procedures for the staff will be developed using MOH and WHO standards. GMEIPO/CHSR staff will work closely with consultants from the MOH and NIH. As part of the process, a formal quality assurance system that will monitor clinical parameters such as intra-operative complications and clinical outcomes will be established. The data will be routinely reviewed and

analyzed to provide formative, process and outcome performance assessments and guidance for continuous quality improvement. Increased quality and clinical effectiveness will be the main expected outcomes of this component of the project.

Different working protocols will be developed, and a s apart of quality assurance, adherence to them will be assessed during the ROU operating.

Payment system development

To make eye care affordable and accessible to the majority of the population of Gegharkunik marz and neighboring regions, a detailed economic analysis and calculation of minimum possible per unit surgical cost will be conducted by GMEIPO/CHSR. It is expected to decrease the unit cost of surgery by 50% by the introduction on the new, efficient equipment and cost-effective procedures as well as increased patient volume to realize economies and qualities of scale.

Alternate payment scenarios will be developed, each with its own pricing, patient volume per pricing category, and costs assumptions. All plans will ensure that the most vulnerable populations (disabled, refugees, nursing home residents, etc.) will be provided free services and those near-vulnerable (low-income) groups will be partially subsidized.

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APPENDIX I.

SPECIALIZATION PROGRAM IN OPHTHALMOLOGY

One-Month Training Course for Nurses

Aims and Learning Outcomes
Aim: provide theoretical knowledge and practical skills on the contemporary methods of eye diseases prevention, diagnostics and treatment to nurses.
In order to achieve the Aim of the course the following Learning Outcomes have been chosen. By the end of the training course the trainee should:
a. get knowledge on the main principles of eye diseases diagnostics and treatment
b. be able to provide primary eye care, pre- and postoperative care to patients
c. assist during ophthalmic surgery

Constituency
The training course is designed for nurses willing to work in ophthalmic centers and departments. A class of 6-10 participants is anticipated.

Rationale
The course is very intensive and short. Because it is short it can be run regularly, impacting the entire eye care, rather than a few specialists. Course is open for ophthalmic nurses, nurses involved in family medicine and primary health care, all other nurses willing to work in ophthalmic care, regardless their citizenship, workplace and age. The course is affordable. It could be conducted in Armenian, Russian or English depending on participants' choice.
The course provides theoretical knowledge as well as practical training.
All the participants who take the exam successfully will be given the certificate recognized by MOH, RA, allowing them to work in ophthalmologic centers and departments.

Learning Needs of Students
The students are expected to have basic knowledge of eye diseases diagnostics and treatment, as well as visual organ anatomy, physiology and basics of optics. Also, they must have complete education in general nursing (at least 2 years).

Conceptual Outline
The course includes basics of visual organ anatomy, physiology, eye refraction and optics, basics of eye diseases diagnostics and treatment, issues of aseptics and antiseptics, the main principles of assisting during ophthalmic surgery, pre- and postoperative care of ophthalmic patients.

Teaching strategy
The training course consists of lectures, practical trainings and group works, which will be conducted in the Medical Center "Kanaker Zejtun" (8th Eye Clinic) and the American University in Armenia (AUA).

Timetable
The first four days of the training course cover issues of surgical care organization in outpatient department, aseptics and antiseptics, as well as patients' care in inpatient department and common topics of first aid. The following two days are spent to study the visual organ anatomy, visual functions and their examination. The 7th day topics cover the

eye refraction, refractive errors and their correction. On the 8th day examination of eye and its accessory apparatus will be covered. Starting from the 9th day different eye pathologies will be studied, including eyeball and eye accessory apparatus diseases and treatment, cataract surgery, glaucoma, eye injuries, tumors and squint. On the 22nd day pharmacotherapy of ocular diseases will be discussed.
The 23rd day is for the examination preparation. On the 24th day students will pass the examination on theoretical knowledge and practical skills.

Description of the Course
Lectures - usually not more than 2 hours long (with 15 min. break), which incorporate also exercises, brainstorming and rounds.
Practical trainings - (1 or 2 per day) 2 hours long (with 30 min. break), which will be held in different eye departments, dressing and operating rooms. During practical trainings students will examine patients, perform different diagnostic tests and clinical procedures, carry patients under the control of course executors. Practical trainings will also include night duties and practicles, followed by self-reflection and evaluation as experiential learning methods.
Group work - usually 2 hours long (with 30 min. break), which include buzz groups, syndicates, brainstorming, open discussions and rounds.

Assessment
Students are allowed to the examination after fulfilling the following requirements:

- Attendance

Absenteeism is not welcomed. Students can miss maximum 3 classes during the whole course of the training.

- Participation in practical trainings

Students should actively participate in class discussions, practical trainings, independently complete assignments and assist in at least 10 surgeries.

- Participation in night duties/shifts

Students should be present on night duties with the shift doctor at least 2 times during the whole course of the training. The student must participate in examination and treatment of all patients admitted during the shift. On the next day the student should present 5 minute report on the spent shift.

The student who do not fulfill above mentioned requirements are not allowed to the course exams.

Final grade

Evaluation and certification depend on the final grade, which itself comprises of the following:

- 50% of the final grade is based on practical skills testing exam's results
- 50% - on theoretical knowledge exam's results

Terms and conditions of practical skills exam

After the course of the training students are passed an exam. The duration of the exam is 3 hours. At least 3 patients with different eye pathologies are assigned to each of the students. Students should independently examine patients and demonstrate their practical skills of eye examination, confirmation of a diagnosis and treatment of revealed pathologies. The grade is based on a 5 point scale.

Terms and conditions of theoretical knowledge exam

After the course of the training students are passed an exam. Exam questions are given beforehand. The exam is oral based on question cards. The number of question cards is 20, each contains 5 questions. 30 minutes is given for preparation. The grade is based on 5 point scale system.

The students who will pass the course of the training, but will not be allowed to the exams, as well as the students whose final grade will be less than 4 points, will be given a certificate on course attendance. The students, who will receive a grade equal to 4 or 5 points, will be given a certificate on professional training.

Learning time ***1 month***

Course Organizers: L.Barseghyan, MD, Professor of Ophthalmology
Head of Ophthalmologic Department, NIH, RA
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O. Najaryan
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L.Kirakosyan

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3. Archives of Ophthalmology http://www.archophtalmol.com – abstracts and articles.
4. American Academy of Ophthalmology http://www.eyenet.org –Information for the professionals and audience.
5. British Journal of Ophthalmology. http://www.bjo.bmjjournals.com/ -current information and archive.
6. Cyber Anatomy Tutorials http://anatome.ncl.ac.uk/tutorials/404.html - Site contains a large information about human anatomy.
7. Cataract Surgery Topics http://mystic.biomed.mcgill.ca/MedinfHome/ZSPROJECTS/Ophthalomolgy/OphthHypertext/Contents.html
8. CSCRS http://www.cscrs.org – Canadian Society of Refractive and Cataract Surgeons.
9. Digital Journal of Ophthalmology http://www.djo.harvard.edu/ -original articles.
10. Eye Doc http://www.eyedoc.narod.ru/ -referats, articles, references.
11. Eye World www.eyeworld.org – abstracts, articles.
12. European Journal of Ophthalmology www.hsr.it/ejo/ejo/html - abstracts, articles, multimedia.
13. National Ophthalmological Project www.eyenews.ru – articles, references, news, journals, subscription.
14. Online Journal of Ophthalmology http://www.onjoph/com/ - On-line journal in English and German.
15. Journal of Cataract and Refractive Surgery www.ascrs.org- abstracts, subscription.
16. Journal of Glaucoma www.glaucomajournal.com – abstracts, subscription.
17. Review of Ophthalmology www.revophth.com – abstracts, articles.

TOPICS TO BE COVERED

Part 1. Organization of surgical care in ambulatory

1. Structure and facilities of surgical department in ambulatory.
2. Working at dressing room.
3. Working at operating room.

Part 2. Aseptics and antiseptics

1. Infections: means, ways of dissemination, prevention.
2. Clothes and dressing material sterilization.
3. Optic instruments and equipment sterilization.
4. Suture material sterilization.
5. Surgeon's and nurse's hands preparation for the surgery
6. Premises disinfection. Preparation of disinfecting solutions.

Part 3. General care of the patient

1. Patients' nursing plan.
2. Nursing process (5 stages- examination, diagnostics, planning, interventions, evaluation).

Part 4. Preoperative preparation and anesthesia

1. Patient's preoperative preparation (physical, psychological preparation, preoperative training
   of patients' as stress prophylaxis).
2. Premeditations.
2. Surgical field preparation and processing.
3. Local anesthesia.
4. General anesthesia.
5. Operating table preparation. Set of instruments for different eye operations.
6. Participation of a nurse during eye surgery.

Part 5. Visual organ anatomy

1. Visual organ and its importance in one's life.
2. Anatomy of the orbit and its relationship with paranasal sinuses and cranial cavity. The role
   of that relationship in pathological processes development in the orbit.
3. Anatomy of the eye accessory apparatus.
4. Blood supply of the eye and the orbit.
5. Innervation of the eye and the orbit.
6. Eye globe anatomy.
7. Extraocular muscles: anatomy, physiology.
8. Ganglion ciliare, topographic anatomy. Retrobulbar block technique.
9. Outer layer of the eye, structure and functions.
10. Middle layer of the eye, structure and functions.
11. Inner layer of the eye (retina), structure and functions.
12. Optic nerve, structure and functions.
13. Visual analisator and visual pathways.

14. Eye chambers. Aqueous fluid and its circulation (eye hydrodynamics).
15. Outflow structures. Anterior chamber angle.
16. Lens: structure and functions. Age – related changes.
17. Vitreous body: composition, structure and functions.

Practical Training

Study of the orbit and eye globe anatomy on plaster casts and enucleated animal eyes.

Part 6. Visual functions and their examination

1. Daylight, twilight vision, photo perception and their examination.
2. Adaptation, adaptometry.
3. Central vision measurement.
4. Visual acuity testing. Visual charts.
5. Macula functions examination (Amsler grid test, maculotester, retinal entopic phenomena).
6. Color vision: examination, disturbances.
7. Peripheral vision, examination tests.
8. Campimetry: technique, indications.
9. Binocular vision: examination, disturbances.

Practical Training

Performing different methods of visual functions examination.

Part 7. Refraction, errors and their correction

1. Optic system and refractive power of the eye.
2. Clinical refraction, states, investigation.
3. Astigmatism: classification, diagnostics, correction.
4. Accommodation.
5. Pseudomyopia: symptoms, diff. diagnostics with myopia.
6. Presbyopia: correction, in case of different errors of clinical refraction.
7. Refractive errors: means of correction (eyeglasses, contact and laser correction).
8. Visual fatigue (asthenopia): symptoms and elimination.

Practical Training:

1. Refractive errors measurement. Cycloplegic drugs.
2. Correction of myopia, hyperopia, astigmatism, presbyopia.
3. Acquaintance with different surgical methods of refractive errors correction (sclerostrenghtening operations, laser correction).

Part 8. Eye and its accessory apparatus examination

1. External examination of the eye and its accessory apparatus. State of skin, eyelid margins and eyelashes.
2. Eye globe alignment in the orbit, its motility. Eye-slit shape and size determination.
3. Lacrimal passage examination tests.
4. Means of illumination during visual organ examination.

5. Biomicroscopy: means of illumination.
6. Ophthalmoscopy: direct, indirect.
7. Diaphanoscopy, indications.
8. Gonioscopy, gonioscops.
9. Ultrasound examination in ophthalmology.
10. Electrophysiological examinations in ophthalmology.

Practical Training

1. Intraocular pressure measurement (palpator and instrumental methods).
3. Eye external examination in direct and lateral illumination.
4. Biomicroscopy.

Part 9 Eye and its accessory apparatus diseases

9.1. Eyelid diseases

1. Eyelid diseases classification.
2. Eyelid skin diseases.
3. Eyelid margins, meibomian glands and ciliar follicles diseases.
4. Eyelid functions and position abnormalities.

9.2. Diseases of the conjunctiva

1. Conjunctivitis: classification.
2. Bacterial conjunctivitis: diagnostics, manifestation, treatment.
3. Viral conjunctivitis: diagnostics, manifestation, treatment.
4. Trachoma, paratrachoma.
5. Fungal conjunctivitis: diagnostics, manifestation, treatment.
6. Allergic conjunctivitis: diagnostics, manifestation, treatment.
7. Degenerative changes in the conjunctiva: pinguecula, pterygium.

Practical Training

1. Carrying patients with conjunctivitis.
2. Performing treatment procedures.

9.3. Diseases of the lacrimal apparatus

1. Dacryocystitis: acute and chronic, diagnostics, clinics, treatment. Dacryiocystitis of the newborns.
2. Dacryoadenitis: diagnostics, clinics, treatment.
3. Dry eye syndrome (Sjogren's): aetiology, diagnostics, clinics, treatment, prevention.

Practical Training

1. Carrying patients with lacrimal system pathology.
2. Schirmer's test.
3. Assistance in lacrimal system probing.
4. Preparation of patients with lacrimal system pathology for X -ray examination.

9.4. Diseases of the cornea and sclera

1. Keratitis: classification.
2. Common symptoms of keratitis.
3. Exogenous keratitis.
4. Endogenous keratitis.
5. Bacterial keratitis: diagnostics, manifestation, treatment.
6. Adenoviral keratitis: diagnostics, manifestation, treatment.
7. Herpetic keratitis: diagnostics, manifestation, treatment, complications.
8. Fungal keratitis: diagnostics, manifestation, treatment.
9. Traumatic keratitis: diagnostics, manifestation, treatment.
10. Corneal dystrophies.
11. Cornea shape and size anomalies. Keratoconus: diagnostics, manifestation, treatment.
12. Keratoplasty: methods, indications, outcomes.
13. Corneal diseases consequences.
14. Episcleritis, scleritis: diagnostics, manifestation, treatment.

Practical training

1. Carrying patients with cornea and sclera diseases.
2. Cornea sensitivity definition.
3. Assisting in surgical procedures on the cornea.

9.5. Diseases of the uvea and vitreous body

1. Uvea diseases classification.
2. Common symptoms of anterior and posterior uveitis.
3. Iritis, iridocyclitis: diagnostics, symptoms, treatment. Diff. diagnostics with acute attack of angle-closure glaucoma.
4. Posterior uveitis (choroiditis), diagnostics, symptoms, treatment.
5. Panuveitis: diagnostics, symptoms, treatment, complications.
6. Vitreous body pathology.

Practical Training

1. Carrying patients with uvea and vitreous body pathology.
2. Drug insertion and treating procedures in uveitis.

9.6. Diseases of the lens

1. Lens development abnormalities.
2. Cataract: classification.
3. Congenital, presenile, senile cataract.
4. Lens injuries: diagnostics, complications, treatment.
5. Drugs used in cataract conservative treatment.
6. Cataract surgery.
7. Intracapsular cataract extraction (ICCE): indications, contraindications, technique, intra- and postoperative complications.
8. Extracapsular cataract extraction with intraocular lens insertion (ECCE+ IOL): indications, contraindications, technique, intra- and postoperative complications.

9. Tunnel cataract extraction: indications, contraindications, technique, intra- and postoperative complications.
10. Phacoemulsification: indications, contraindications, technique, intra- and postoperative complications.
11. Application of laser in cataract surgery.
12. Intraocular lenses: different models and lens selection.
13. Preoperative anesthesia.

Practical Training

1. Diagnosing and determining the stage of cataract.
2. Carrying patients with cataracts. Patients' preoperative preparation.
3. Transference and transportation of patients.
4. Premeditations and preoperative anesthesia.
5. Preparation of operating room.
6. Preoperative field processing.
7. Assistance in the operations.
8. Irrigation – aspiration technique.
9. Eye aseptic bands application.
10. Postoperative care and control of patients.

9.7. Diseases of the retina

1. General forms of retinal pathology.
2. Retinal vessels (CRV and CRA) occlusions. Urgent aid.
3. Infections, inflammations of the retina (retinitis).
4. Retinopathies (hypertensive, diabetic).
5. Visual organ pathology concomitant to endocrine pathology.
6. Visual organ pathology due to HIV- infection: epidemiology, diagnostics, manifestation, prevention.
7. Retinal dystrophies: classification, diagnostics, symptoms, prevention.
8. Retinal angiomatosis: aetiology, symptoms, complications, treatment.
9. Retinal angiitis: aetiology, classification, symptoms, complications, treatment.
10. Retinal detachment: aetiology, classification, diagnostics, symptoms, outcomes. Urgent aid.

Practical Training

1. Carrying patients with retina pathology.
2. Providing urgent premedical aid in retinal vessels occlusions and detachment.

9.8. Diseases of the optic nerve and visual pathways

1. Congenital abnormalities of the optic disc.
2. Optic nerve inflammations (neuritis): aetiology, classification, diagnostics, symptoms, treatment.
3. Retrobulbar neuritis.
4. Optic nerve vascular diseases (ischemic optic neuropathies): aetiology, diagnostics, clinics, treatment.
5. Papilloedema: aetiology, classification, diagnostics, clinics, treatment.

6. Optic chiasm inflammations: aetiology, diagnostics, clinics, symptoms, treatment.
7. Optic nerve atrophy: aetiology, classification, symptoms, treatment.

Practical Training

1. Carrying and examining patients with optic nerve and visual pathways diseases.
2. Preparation of drugs for injection (dilution and dosage).

9.9. Glaucoma

1. Intraocular liquid, intraocular pressure (IOP).
2. Eye hydrodynamics and hydrostatics.
3. Glaucoma classification.
4. Congenital and juvenile glaucoma: etiopathogenesis, diagnostics, clinics, treatment.
5. Primary open-angle and angle-closure glaucoma.
6. Low pressure (normotensive) glaucoma.
7. Acute attack of angle-closure glaucoma: symptoms, urgent aid.
8. Secondary glaucoma: classification.
9. Conservative treatment of glaucoma, (main drug groups).
10. Glaucoma surgery: means of surgery, indications, contraindications.
11. Laser treatment of glaucoma: indications and contraindications.
12. Glaucoma patients work and life regimen.
13. Importance of prophylactic inspections for glaucoma revelation.

Practical Training

1. Carrying patients with glaucoma.
2. Performing IOP measurement (tonometry, tonography).
3. Performing perimetry.
4. Providing urgent aid in acute attack of angle-closure glaucoma.
5. Assisting in glaucoma surgery.

9.10. Eye injuries

1. Eye injuries: classification.
2. Penetrating and non-penetrating injuries to the eye. Absolute and relative signs of eye penetrating injuries with foreign body insertion.
3. Diagnostic methods for intraocular foreign body (IOFB) revelation.
4. Intraocular foreign body location definition (Comberg-Baltin's prosthesis, Poliak's measuring tables).
5. Eye penetrating injuries with foreign body insertion: complications. Indications for IOFB removal.
6. Sympathetic ophthalmitis: diagnostics, symptoms, treatment, preventive measures.
7. Endophthalmitis, panophthalmitis: conservative and surgical treatment.
8. Enucleation, evisceration, exenteration. Indications for eye prosthetics. Characteristics and care of artificial eye.
9. Eye contusions: classification, diagnostics, symptoms, treatment, outcomes.
10. Eye burns: classification, common principles of treatment, urgent aid.

Practical Training

1. Providing urgent aid to patients with eye injuries.
2. Assisting in eye wounds primary surgical processing.
3. Performing Zejdel's test.
4. Getting acquainted with instrumental methods of diagnosing the intraocular foreign body.

9.11. Squint

1. Binocular vision, disturbances.
2. Types of squint: latent, manifested, apparent.
3. Convergent squint.
4. Paralytic squint: causes, symptoms, surgical treatment.
5. Ambliopy: classification, treatment.
6. Squint treatment. Indications for surgery.

Practical Training

1. Carrying patients with squint.
2. Visometry of children.
3. Binocular vision examination.

9.12. Orbital diseases

1. Dysthyroid eye diseases (oedemic exophthalm).
2. Vascular diseases of the orbit: hemorrhages, spontaneous pulsing exophthalmia.
3. Inflammatory diseases of the orbit: tenonitis, myositis, periostitis, thrombophlebitis, orbital abscess, flegmona, dacryoadenytis.

Practical Training

1. Carrying patients with orbital diseases.
2. Performing orientative exophthalmometry.

9.13. Ophthalmooncology

1. Eyelids tumors.
2. Orbital tumors.
3. Eye globe tumors. Retinoblastoma, melanoma.

Practical Training:

Carrying patients with eye tumors.

9.14. Eye diseases pharmacotherapy

1. General principles of eye diseases pharmacotherapy.
2. Main drug groups used in eye pathologies treatment.

TRAINING PROGRAM FOR OPHTHALMIC NURSES

TIMETABLE

	Session / Theme	Staff	Place
Day 1	*Lecture:* Organization of surgical care in outpatient department. *Practical training:* Working in dressing and operating rooms.	RK	Auditorium Operating Room
Day 2	*Lecture:* Aseptics. *Practical training:* Clothes, operating equipment, dressing suture materials sterilization.	RK	Auditorium Operating Room
Day 3	*Lecture:* Antiseptics. Infections: types, ways of dissemination, preventive measures. *Practical training:* Disinfection of premises. Disinfecting solutions' preparation.	RK	Auditorium Operating Room
Day 4	*Lecture:* First aid. *Practical training:* Demonstration of providing first aid.	RK	NIH NIH
Day 5	*Lecture:* Visual organ anatomy. *Practical training:* Study of visual organ anatomy on plaster casts and schemes.	ASh	Auditorium Auditorium
Day 6	*Lecture:* Visual functions and their examination. *Practical training:* Visometry, perimetry, binocular vision test, ophthalmometry.	SB	Auditorium Exam. room
Day 7	*Lecture:* Eye refraction. Refractive errors and their correction. *Practical training:* Determination of clinical refraction type. Trial glass correction of refractive errors.	LB	Auditorium Auditorium
Day 8	*Lecture:* Eye and its accessory apparatus examination. *Practical training:* Performing eye and its accessory apparatus external examination.	ET-A	Auditorium Auditorium
Day 9	*Lecture:* Eyelid and lacrimal system pathologies. *Practical training:* Eye-slit opening technique. Lacrimal pathways' washing and probing.	ET-A/AA	Auditorium Dressing room
Day 10	*Lecture:* Diseases of the conjunctiva.	AG	Auditorium

	Practical training: Performing conjunctivitis treating procedures (conjunctival sac washing, eye drops instillation, eye ointments and drug tampons application).		Dressing room
Day 11	*Lecture:* Diseases of the cornea and sclera. *Practical training:* Performing cornea sensitivity and epithelium tests.	AG	Auditorium Dressing room
Day 12	*Lecture:* Diseases of the uvea and vitreous body. *Practical training:* Performing cyclic pain revealing test. Participation in treatment of uveitis.	AG/ET-A	Auditorium Dressing room
Day 13	*Lecture:* Diseases of the lens. *Practical training:* Premedications and preoperative preparation of patients' for cataract surgery.	LB	Auditorium Dressing room
Day 14	*Lecture:* Cataract surgery. *Practical training:* Assistance in cataract surgery.	LB	Auditorium Operating room
Day 15	*Lecture:* Diseases of the retina, optic nerve and visual pathways. *Practical training:* Patients' preparation for eye fundus examination.	AH/SB	Auditorium Exam. room
Day 16	*Lecture:* Glaucoma. *Practical training:* Performing tonometry and tonography.	AH	Auditorium Exam. room
Day 17	*Lecture:* Secondary glaucoma. Glaucoma surgery. *Practical training:* Glaucoma patients' preoperative preparation and premedications. Assistance in surgery.	AH	Auditorium Operating room
Day 18	*Lecture:* Eye injuries. *Practical training:* Providing first aid to patients with eye injuries. Assistance in eye injuries' primary surgical processing.	AA	Auditorium Dressing room
Day 19	*Lecture:* Eye contusions and burns. *Practical training:* Providing first aid to patients with eye contusions and burns.	AA/ET-A	Auditorium Dressing room

Day 20	*Lecture:* Squint. *Practical training:* Working in orthoptic cabinet. Binocular vision test.	LB	Auditorium Exam. room
Day 21	*Lecture:* Orbital diseases. Ophthalmooncology. *Practical training:* Carrying patients with eye tumors. Application of eye compressing bandages. Performing orientative exophthalmometry.	ET-A	Auditorium Exam. room
Day 22	*Lecture:* Drug therapy of ocular diseases. *Practical training:* Performing treating procedures.	VB	Auditorium Exam. room
Day 23	**Individual study - preparation for the examination.**		
Day 24	**Examination on practical skills.** **Oral examination on theory.**		Auditorium

Abbreviations
LB- Levon Barseghyan
NK- Naira Khachatryan
AH- Alla Hovhanessyan
SB- Svetlana Bakhshinova
AA- Adrine Avetisyan
ET-A- Eduard Ter- Andriasov
AG- Aharon Gabrielyan
ASh- Ara Sharambekyan
VB- Varditer Balyan
RK- Ruzanna Khachatryan
VH- Varsik Hakobyan

AChA- anterior chamber angle
BV- binocular vision
CRA- central retinal artery
CRV- central retinal vein
EPhE- electrophysiological examination
ERG- electroretinography
FAG- fluorescent angiography
IOL- intraocular lens
IOF- intraocular fluid
IOP- intraocular pressure
IOFB- intraocular foreign body
PMSP- primary microsurgical processing
RVA- retinal vision acuity

TRAINING PROGRAM FOR OPHTHALMIC NURSES

Session plan for Day 1

9:30 – 9:45 Participation in the morning round.

9:45 - 10:00 Presentation of the training course by the course organizers
Present the aims, objectives, duration, content and the course of the training. Introduce to the students the implementers of the course. Ask students to present their suggestions regarding the training course and teaching methods. Answer to their questions. Find out the most important topics for them to introduce respective changes into the training course.

10:00 - 10:15 Introduction: Lecturer – R. Khachatryan
The lecturer and the students introduce themselves. The lecturer asks each trainee to introduce him/her briefly and to tell what he/she anticipates from the course.

10:15 – 11:00 L1 (1): Operation room: structure, equipment and facilities.
Facilities of the surgical department. Surgical instruments, suture materials and how to keep/store them.

11:00 – 11:15 Break

11:15 – 11:45 L1 (2): Principles of a nurse work in the surgical department, in the clean dressing room, and in the dressing room for purulent cases.
Behavior and hygienic rules of nurse activities in dressing rooms and operating block.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Discuss the lecture material on the following topics:
Set of surgical equipment for eye surgery and manipulations.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Continue discussion of the lecture material. Ask students to present the main principles/rules of a nurse work in the surgical department, in the clean dressing room, and in the dressing room for purulent cases.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Accompany students to the eye department, and show them the facilities and equipment of different units and dressing rooms. Present to them the main principles of a nurse work in the dressing room. Give them opportunity to participate in preparation of dressing materials and in their distribution in drums.

15:30 – 15:45 Break

15:45 – 16:10 GW (2): Accompany students to the operating room. Show them the facilities and illumination. Present the main principles/rules of a nurse work in the operation room. Demonstrate sets of surgical instruments used in different eye surgeries.

16:10 – 16:20 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work using 10 point scale system.

16:20-16:30 Make a night duties' table.
Each student must have 2 night duties per month. The night duties will be followed by self-reflection and evaluation (five minutes in the beginning of lecture on the next day will be given for it).

Session plan for Day 2

9:30 – 9:45 Participation in the morning round.

10:00 – 10:45 L2 (2): Aseptics: Part 1. Lecturer – R. Khachatryan
Distribution and sterilization of cloths and dressing staff. The main rules of operating the drums.

10:45 – 11:00 Break

11:00 – 11:45 L2 (1): Aseptics. Part 2.
Sterilization of surgical instruments and suture materials.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Discuss aseptics. Present the main methods of sterility control.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Ask students to present the principles of sterilization.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Demonstrate to the students the main sterilization equipment, and how to distribute and prepare the dressing staff, clothes and used instruments for sterilization.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Demonstrate the techniques of hands' washing.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work, and the importance of discussed topics in terms of their practical application in ophthalmology using 10 point scale system.

Session plan for Day 3

9:30 – 9:45 Participation in the morning round.

10:00 – 10:45 L3 (1): Antiseptics. Lecturer – R. Khachatryan
The aims and objectives of antiseptics. Infections: types, agents, ways of dissemination and infecting. Ways to combat infections.

10:45 – 11:00 Break

11:00 – 11:45 L3 (2): Antibacterial agents and drugs.
Action mechanism of antibiotics. The main groups of antibiotics and their efficient combinations.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Explain the main types of infections (aerobic, anaerobic, mixed) and the ways of dissemination. Present to the students the schematic table containing classification of infections, the ways of dissemination, and the list of antibiotics specific for different types of infectious agents.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Present disinfecting solutions, how to prepare them, and rules of facilities' disinfection.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Together with students prepare disinfecting solutions.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Demonstrate to students the test to reveal sensitivity towards antibiotics.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work using 10 point scale system.

Session plan for Day 4

9:30 – 9:45 Participation in the morning round. Refer students to NIH.

10:00 – 10:45 L (1): The first aid.
Principles of the first aid. Means used in the first aid. The sequence of providing the first aid.

10:45 – 11:00 Break

11:00 – 11:45 L (2): The first aid in emergency situations and cases: poisoning, shock, coma, Arrest of capillary, venous and arterial bleeding**.**

11:45 – 12:00 Break

12:00 – 12:45 GW (1): Discuss poisonings. Ask students to define and list poisons, and the means of the first aid. Discuss different ways of bleeding arrest.

12:45 - 13:15 Lunch

13:15 - 14:00 PT (1): Demonstrate on plaster casts artificial ventilation of the lungs and cardiac massage.

14:00 – 14:15 Break

14:15 – 15:15 PT (2): Demonstrate on plaster casts different types of injections: intravenous, intramuscular, and preparation for transfusions.

15:15 – 15:30 Break

15:30 – 16:20 PT (3): Demonstrate on the plaster casts the first aid in bleeding.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work using 10 point scale system.

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Rosdhl Caroline: Student workbook to accompany the fifth edition of textbook of Basic Nursing.

Smith Duell Martin: Instructor's Manual and checklists; Clinical thinking, Infection Control, 2002.

Session plan for Day 5

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – A. Sharambekyan

The lecturer and the students introduce themselves. The lecturer asks each trainee to introduce him/her briefly and to tell what he/she anticipates from the course.

10:00 – 10:45 L5 (1): Visual organ anatomy.

Embryogenesis of the eye. Anatomy of the bone orbit. Eyeball anatomy, its blood supply and innervation.

10:45 – 11:00 Break

11:00 – 11:45 L5 (2): The visual analisator, visual pathways. The eye accessory apparatus. The eye motility apparatus.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Study of the orbit and eyeball anatomy on plaster casts and enucleated animal eyes. Show the ducts, canals, fissures, define the anatomic units passing through them.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Study of the eye accessory apparatus, visual analisator, its central and peripheral parts using schemes.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:

Anatomy of the orbit, and the relationship of its walls to the development of orbital pathological processes. Eyelids and conjunctiva: anatomy, histology, role/functions, vascularization/blood supply, innervation. Lacrimal organs: anatomy, role/functions, tear composition and production, lacrimal ducts. Eye motility apparatus: anatomy, functions, vascularization, innervation.

Ask students to show the canals and fissures of the orbit and to define the anatomic units passing through them.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics: Ocular membranes (outer, middle and inner layers of the eye): anatomy, histology, functions. Outflow structures of the eye: chambers, anterior chamber angle. Lens: anatomy, histology, functions, age related changes.

Ask questions to assess how the students learn/master the topic.

16:20 – 16:30 Discussion and summarizing the study material.

Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work, and the importance of discussed topics in terms of their practical application in ophthalmology using 10 point scale system.

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Session plan for Day 6

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – S. Bakhshinova

The lecturer and the students introduce themselves. The lecturer asks each trainee to introduce him/her briefly and to tell what he/she anticipates from the course.

10:00 – 10:45 L6 (1): Visual functions and their examination.

Daylight, twilight vision, photo perception. Central vision, visual acuity. Binocular vision.

10:45 – 11:00 Break

11:00 – 11:45 L6 (2): Color vision. Congenital and acquired disorders of color vision. Adaptation and its types.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Practical work in the examination room.

Allow students to measure the visual acuity using different visometric charts, to examine the visual field (orientative and using special equipment), and to conduct binocular vision examination.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): In the presence of students conduct adaptometry and examine color vision using Rabkin's charts.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:

Central vision, units used for visual acuity measurement. Peripheral vision, visual field and its borders in norm and in pathology. Visual field defects (scotoma, hemianopsia). Campimetry. Binocular vision and its disturbances (simultaneous and monolateral).

Ask students to define the normal visual field borders using white color and to depict the visual field defects.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics: color vision, its disturbances, adaptation: types, disturbances.

16:20 – 16:30 Discussion and summarizing the study material.

Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work,

and the importance of discussed topics in terms of their practical application in ophthalmology using 10 point scale system.

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Session plan for Day 7

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – L. Barseghyan

10:00 – 10:45 L7 (1): Eye refraction. Refractive errors and their correction.
Optic system of the eye. Accommodation. The types of clinical refraction: emmetropia, myopia, hyperopia. Astigmatism: types, subtypes and stages.

10:45 – 11:00 Break

11:00 – 11:45 L7 (2): Pseudomyopia and myopia. Presbyopia, correction. Visual fatigue.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Each student examines patients to determine the clinical type of refraction using subjective method, and prescribes trial glass correction. Discuss in a group the main cycloplegic drugs, their usage, indications and contraindications. Each student is assigned a patient to prepare him/her for the objective method of examination of refraction (sciascopy).

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Allow students to be present on sclerostrengthening surgeries.

15:00 - 15:15 Break

14:45 – 15:30 GW (1): Discuss the lecture material.
Pay attention on the questions on etiopathogenesis, classification, clinical course, treatment and prevention of myopia, as well as differential diagnostics of pseudo- and real myopia.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Discuss in a group refraction pathologies and ways of correction.

Distribute to the students refraction problems and discuss them in a group.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

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Session plan for Day 8

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – E. Ter-Andriasov
The lecturer and the students introduce themselves.

10:00 – 10:45 L8 (1): Examination of the eye and its accessory apparatus.
External examination of eye and its accessory apparatus. Types of illumination during eye examination. Different methods of eye examination: biomicroscopy, ophthalmoscopy, diaphonoscopy, gonioscopy.

10:45 – 11:00 Break

11:00 – 11:45 L8 (2): Ultrasonic and electrophysiological examinations used in ophthalmology.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Patient consultation under the supervision of the lecturer to assess:
- state of the skin of the eyelids and ciliar margins
- the shape and the size of the eye-slit
- the eyeball alignment and motility

Allow students in turn to examine the eye in direct and lateral illumination, as well as suing a slit-lamp.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Explain and show to the students how to prepare a patient for gonioscopy, examination of the eye fundus, ultrasound and electrophysiology methods of examination.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material.
Ask questions related to the types of illumination during eye examination, and biomicroscopy. Ask students to define the types of ophthalmoscopy and to draw the image of the eye fundus in norm.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material. Draw on the board and explain the anatomic zones of the anterior chamber angle.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

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Session plan for Day 9

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L9 (1): Eyelid diseases. Lecturer – E. Ter-Andriasov

Eyelid diseases classification. The diseases of the skin, ciliar margins, meybomian glands: blepharitis, meibomitis, sty (hordeolum), chalazion. Eyelid anomalies: epicanthus, ectropion, entropion, lagophthalmos.

10:45 – 11:00 Break

11:00 – 11:45 L9 (2): Diseases of lacrimal organs. Lecturer – A. Avetisyan

Acute and chronic dacryocystitis, dacryocystitis of newborns, dacryoadenitis. Dry eye syndrome (Sjogren's syndrome): etiopathogenesis, diagnostics, treatment.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Demonstrate to the students how to open the eye-slit, how to apply hot and cold eye lotions, how to massage eyelids, how to apply drugs on ciliar margins and how to apply eye ointments. Give the student an opportunity to perform the above mentioned procedures by their own, and to assist during eyelid surgeries.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Demonstrate to the students Schirmer's test, and lacrimal sac and ducts massage ("vibration" massage). Give them opportunity to assist in washing and probing lacrimal ducts.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discussion of the lecture material, paying specific attention on the acute

and chronic infection diseases of the eyelids, in particular on herpetic affection.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following themes:

Dacryocystitis, dacryoadenitis. Ask students about etiopathogenesis of dacryocystitis of newborns, its prophylaxis/prevention and course of treatment. Ask them about clinical manifestations of Sjegren's syndrome and its treatment.

16:20 – 16:30 Discussion and summarizing the study material.

Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 153-168 / 168-180.

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Session plan for Day 10

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – A. Gabrielyan
The lecturer and the students introduce themselves.

10:00 – 10:45 L10 (1): Diseases of the conjunctiva.
Classification of conjunctivitis: bacterial, viral, allergic and fungal conjunctivitis.
Vernal conjunctivitis: aetiology, clinical course and treatment.

10:45 – 11:00 Break

11:00 – 11:45 L10 (2): Dystrophies of the conjunctiva: pinguecula, pterygium. Trachoma, paratrachoma.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Together with students wash the conjunctival sac, apply eye drops, eye ointments, eye drug membranes and drug tampons. Show them the technique of eyelid evertion.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Accompany students to the laboratory room to get acquainted with the technique of taking an eye culture for bacteriological analysis.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discussion of the lecture material.
Pay particular attention on differential diagnostics of viral conjunctivitis. Describe the methods of gonoblenorrhea prevention. Ask students to present in written common symptoms of conjunctivitis.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Discuss the epidemiology, clinical course and treatment of viral conjunctivitis. Show on the atlas dystrophies of conjunctiva.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 180-197.

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Session plan for Day 11

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L11 (1): Diseases of the cornea. Lecturer – A. Gabrielyan

Classification of keratitis. Exogenous and endogenous keratitis. Viral keratitis: herpetic, adenoviral. Bacterial keratitis: tuberculous, diplobacillar, streptococcal, staphylococcal, pneumococcal.

10:45 – 11:00 Break

11:00 – 11:45 L11 (2): Dystrophies of the cornea. Scleritis, episcleritis.

Primary and secondary dystrophies of the cornea. Keratoconus: diagnostics, clinical course and treatment. Keratoplastics: methods, indications, outcomes. Scleritis, episcleritis: diagnostics, clinical course and treatment.

11:45 – 12:00 Break

12:0 – 13:00 PT (1): Consult patients with keratitis.

Perform cornea sensitivity and epithelium tests. Allow students to assist in different interventions/manipulations on the cornea.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Consult a patient with keratoconus.

Perform ophthalmometry and visual correction.

Ask the students to solve the problem, for example to determine the stage of keratoconus. Compare the answers.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:

Exogenous and endogenous keratitis. Outcomes and complications of keratitis. Treatment of keratitis, scleritis and episcleritis.

Ask students to define the common symptoms of keratitis, and to differentiate viral and bacterial keratitis.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:

Keratoconus, keratoplastics. Explain indications for keratoplastics, its technique/ methodology and outcomes.

Ask students how many ways of keratoplastics do they know.

16:20 – 16:30 Discussion and summarizing the study material.

Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 197-245.

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Session plan for Day 12

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L12 (1): Diseases of the uvea. Lecturer – A. Gabrielyan
Classification of the uveal disease. Common symptoms of anterior and posterior uveitis. Anterior uveitis: iritis, iridocylclitis. Posterior uveitis (choroiditis): limited and disseminated. Panuveitis: classification, diagnostics, clinical course and treatment.

10:45 – 11:00 Break

11:00 – 11:45 L12 (2): Diseases of the vitreous body. Lecturer – E. Ter-Andriasov
Haziness and destructions of the vitreous body. Hemophthalmos: partial and total.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Perform cyclic pain revealing test. Show the ways of drug application in uveal pathologies. Test the skills of students how to prepare the drugs for injection.
Together with students, provide the first aid to a patient with acute iridocyclitis.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Vitreous body pathology: haziness and hemorrhages.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material.
Special attention should be paid on the differential diagnostics of acute iridocyclitis and the attack of angle closure glaucoma. Ask students to develop a table containing the main symptoms of anterior and posterior uveitis. Show on the atlas the pathologies of the uveal tract caused by endogenous infection (tuberculosis, syphilis, cytomegalovirus).

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Ask students to define the main pathologies of the vitreous body. Show on the atlas the pathologies of the vitreous body.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 269-303.

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Session plan for Day 13

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L13 (1): Diseases of the lens. Lecturer – L. Barseghyan
Cataract classification: congenital, acquired, cortical, central, nuclear, anterior and posterior polar.

10:45 – 11:00 Break

11:00 – 11:45 L13 (2): Biomicroscopic signs of incipient, immature, mature and hypermature cataracts.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Explain to the students premedication and preoperative preparation methods/techniques, show them on patients. Give them an opportunity to prepare a patient by their own.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Show the set of surgical instruments for cataract extraction and IOL implantation.
Together with students, prepare the operation table with necessary surgical instruments.

14:30 – 14:45 Break

14:45 – 15:30 GW (1) Discussion of the lecture material on the following topics: congenital and acquired cataracts.

Give an assignment to the students to determine the type and the stage of cataract. Discuss the answers.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Special attention should be paid on diabetic cataract and its peculiarities.
Ask students to define the drugs used for cataract treatment, and determine the advisability of their prescription in different stages of cataract.

Give an assignment to students to make a diagnose of cataract based on photos, to propose a course of treatment (surgical or drug), and to substantiate/prove the answer.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Session plan for Day 14

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L14 (1): Cataract surgery. Lecturer – L. Barseghyan
Intracapsular and extracapsular cataract extraction (ICCE, ECCE), phacoemulsification: indications, contraindications, complications.

10:45 – 11:00 Break

11:00 – 11:45 L14 (2): Different types and models of IOL.
Anterior and posterior chamber lenses, iris supported lenses. Intraocular lens (IOL) insertion: technique, indications, contraindications.

11:45 – 12:15 Lunch

12:15 – 14:30 PT (1/2): Accompany students to the operating room.
Divide them into groups and give them opportunity to assisst in cataract surgery. Special attention should be paid on aspiration - irrigation skills.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss advantages and disadvantages of different methods of cataract extraction.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Show the students different types of IOLs and explain how to use them.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

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Session plan for Day 15

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – A. Ohanesyan
The lecturer and the students introduce themselves.

10:00 – 10:45 L15 (1): Diseases of the optic nerve.
Classification of optic nerve diseases. Neuritis and optic nerve atrophy.

10:45 – 11:00 Break

11:00 – 11:45 L15 (2): Diseases of the retina. Lecturer – S. Bakhshinova
Classification of retina diseases (inflammations, vascular diseases and dystrophies). Vascular diseases: occlusion of Central Retinal Vein and Central Retinal Artery. Inflammatory diseases: retinitis, maculitis. Hypertensive and diabetic retinopathies.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Accompany students to the examination room.
Assign patients with optic nerve pathologies to the students, and ask students to perform perimetry.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Together with students examine patients with retinal pathologies.
Test the retinal enthopic phenomena.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Ask questions regarding retina and optic nerve anatomy.
Discuss the lecture material on the following topics: Retinitis, retinopathies, maculitis, maculodystrophy. Discuss etiopathogenesis, clinical course, treatment and urgent aid in retinal detachment.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:
Optic nerve inflammatory diseases: papillitis, retrobulbar neuritis. Papilledema and optic nerve atrophy. Show on the atlas pathologies of the retina and optic nerve.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

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Session plan for Day 16

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L16 (1): Glaucoma. Lecturer – A. Hovhannesyan
Eye hydrodynamics and hydrostatics. Intraocular fluid and intraocular pressure. Glaucoma classification: congenital, juvenile, open-angle and angle closure glaucoma. Acute attack of angle closure glaucoma: clinical course and first aid.

10:45 – 11:00 Break

11:00 – 11:45 L16 (2): Treatment of glaucoma. The main groups of medicaments' used for glaucoma treatment.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Together with students examine patients with glaucoma.
Ask them to measure intraocular pressure (by palpation, using tonometry), perform tonography and perimetry.

Assignment: based on the results of examination define the stage of glaucoma. Evaluate the answers.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Accompany students to the examination room.
Ask students to perform glaucoma diagnostic tests.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Intraocular fluid and intraocular pressure. Primary open-angle and angle closure glaucoma. Glaucoma diagnostics: intraocular pressure in norm and pathology. Changes of the optic disc and visual field in glaucoma patients.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:
Treatment of glaucoma. Main groups of medications: myotics, adrenergics, carboanhydraze inhibitors, diuretics.

Ask students what regimen of work and life style should patients with glaucoma adopt. What is students'opinion about dispenser follow-up of glaucoma patients.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Session plan for Day 17

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L17 (1): Secondary glaucoma. Lecturer – A. Ohannesyan
Classification of secondary glaucoma.

10:45 – 11:00 Break

11:00 – 11:45 L17 (2): Glaucoma surgery.
Types of glaucoma surgeries. Laser application in glaucoma surgery.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Together with students provide preoperative preparation of patients for glaucoma surgery. Show the set of glaucoma surgery instruments, and give them opportunity to assist in surgeries.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Explain indications for and technique of implementation of optic nerve alkoholization. Allow students to participate in the treatment of patients during postoperative period.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Secondary glaucoma and its classification. A special attention should be paid to the following types of glaucoma: postinflammatory, phacogenic, vascular, traumatic, and postoperative.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:
Glaucoma surgery, types of antiglaucomatous operations, indications for different types of surgeries.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

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Session plan for Day 18

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L18 (1): Eye injuries. Lecturer – A. Avetisyan
Classification of the eye and its accessory apparatus injuries. Penetrating and non penetrating injuries. Diagnostics of intraocular foreign body (IOFB). .

10:45 – 11:00 Break

11:00 – 11:45 L18 (2): Complications of eye penetrating injuries.
Sympathetic inflammation, endophthalmitis and panophthalmitis.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Accompany students to X-ray unit and present X-ray diagnostic procedure. Together with them prepare a patient with eye injury for X-ray examination.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Accompany students to the operation room and give them opportunity to assist in primary surgical processing of eye injuries or in performing enucleation and evisceration.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Non-penetrating injuries. Penetrating injuries with IOFB. Indications for IOFB removal.

Question for the students: What are the absolute and relative signs of penetrating injuries with IOFB penetration?

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:
Complications of penetrating injuries. Sympathetic inflammation, endophthalmitis and panophthalmitis.

Discuss prevention of sympathetic inflammation.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Chose a student for a night duty in the hospital. Assign him to prepare a report of the duty.

Session plan for Day 19

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L19 (1): Eye contusions. Lecturer – A. Avetisyan
Eye contusions: classification, diagnostics, clinical course, treatment and outcomes.

10:45 – 11:00 Break

11:00 – 11:45 L19 (2): Eye and its accessory apparatus burns. Lecturer – E. Ter-Andriasov.
Burns: classification, general principles of treatment, first aid.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Refer students to trauma unit where they can examine and provide the first aid to patients with contusions.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Continue examining patients in trauma unit. Examine patients with eye burns and together with students provide the first aid.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Eye contusion: diagnostics, clinical course, treatment and outcomes.

Question for the students: What are the signs of contusion?

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Discuss the lecture material on the following topics:
Burns: classification, general principles of treatment, urgent aid.

The student reports the results of the night duty/shift.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Chose a student for a night duty/shift in the hospital. Assign him to prepare a report of the duty.

Literature:

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Gundorova R.A., Malaev A.A., Ujakov A.I.. Eye Injuries. Moscow, “Meditsina”, 1986.

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Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, “Phoenix”, 2000, part 19, P. 403 - 413.

Session plan for Day 20

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L20 (1): Squint. Lecturer – L. Barseghyan
Binocular vision, disturbances. Classification of squint.

10:45 – 11:00 Break

11:00 – 11:45 L20 (2): Amblyopia: classification and treatment. The stages of conservative/drug treatment of squint. Indications for surgical treatment and types of surgeries.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Refer students to the ortoptic room where they can examine patients with squint, perform visometry and trial glass correction by their own, and may define the type of binocular vision**.**

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Continue examining patients in the ortoptic room. Give students an assignment to determine the status/condition of eye motility apparatus, objective and subjective squint angles.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Concomitant squint: etiopathogenesis, diagnostics, clinical course and treatment. Paralytic squint: etiopathogenesis, diagnostics, clinical course and treatment.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:
Treatment of squint. Indications for and types of surgical interventions in patients with squint.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

The student reports the results of the night duty/shift.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 387 - 411.

Gorbani A.I, Djaliashvili I.A. Eye Microsurgery: Mistakes and Complications. Saint – Petersburg, "Hippocrates", 1993, part 4, P. 104 – 132.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, part 16, P. 373 – 383.

Session plan for Day 21

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L21 (1): Orbital diseases. Lecturer – E. Ter- Andriasov
Vascular diseases of the orbit: hemorrhages, spontaneous pulsing exophthalmia. Inflammatory diseases of the orbit: tenonitis, myositis, periostitis, thrombophlebitis, orbital abscess, phlegmon.

10:45 – 11:00 Break

11:00 – 11:45 L21 (2): Ophthalmooncology.
Tumors of the eyelids, orbit and eye globe.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Refer students to the oncoophthalmology department, where they can examine patients with eye tumors.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Organize and monitor the care of the patients with eye tumors.

Ask students to perform orientative exophthalmometry.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Vascular and inflammatory diseases of the orbit.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Continue discussion of the lecture material on the following topics:
Eyelid, orbit and eye globe tumors.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 411 – 450.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, part 13, P. 333 – 353.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, part 17, P. 383 – 390.

Session plan for Day 22

9:30 – 9:45 Participation in the morning round.

9:45 – 10:00 Introduction: Lecturer – V. Balyan
The lecturer and the students introduce themselves. The lecturer asks each trainee to introduce him/her briefly.

10:00 – 10:45 L22 (1): Pharmacotherapy of eye diseases.
Common principles of eye disease pharmacotherapy.

10:45 – 11:00 Break

11:00 – 11:45 L22 (2): The main groups of medications' used in ophthalmology and their medicinal forms.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Training in the dressing room. Performing different procedures (eye drop application, intravenous and intramuscular injection, blood pressure measurement, tonometry).

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Continue training in the dressing room.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Common principles of eye disease pharmacotherapy, local and general treatment.

15:30 – 15:45 Break

15:45- 16:20 GW(2):Continue discussion of the lecture material on the following topics:
Steroid and non-steroid, antimicrobic, antiallergic drugs: indications, contraindications and their combinations.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training and the group work using 10 point scale system.

Literature:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 531 - 552.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, part 1, P. 9– 27.

Session plan for Day 23

Preparation for the examination.

Session plan for Day 24

10:00 -13:00 Examination on practical skills (part 1).

13:00 - 14:00 Break.

14:00 - 17:00 Oral examination on theory (part 2).

APPENDIX II.

Necessary Skills for Ophthalmic Nurses

By the end of the course the trainee should be able to:

1. perform visometry
2. perform perimetric measuring procedures
3. perform binocular vision examination
4. perform color vision examination
5. perform orientative exophthalmometry
6. perform eye external examination in lateral illumination
7. test corneal reflex (sensitivity)
8. examine lacrimal apparatus
9. perform lacrimal sac massage
10. perform lacrimal sac evacuation
11. conduct cyclic pain revealing test
12. perform palpator tonometry
13. perform tonometry, tonography
14. apply hot and cold eyelotions
15. perform conjunctival sac washing
16. perform eye drops instillation, eye ointments and drug-tampons application
17. remove foreign bodies from cornea and conjunctiva
18. examine pupil reactions
19. determine eye refraction (by subjective method)
20. choose glasses for reading
21. apply eye cotton-gauze bandages and tapes
22. provide first aid in urgent situations
23. be aware of general principles of in inpatient and outpatient departments patients nursing
24. be aware of prophylactic work general principles and carry out prophylactic medical examination

APPENDIX III.

Nurse Activities

1. Preparation of washing solutions.
2. Hygienic cleaning of in-patient department.
3. Wet and dry cleaning of wards, dressing and operating rooms.
4. Patients hygienic processing.
5. Preparation of disinfecting solutions.
6. Sterilization of patients items of care.
7. Thermometry, thermometric curve drawing. Disinfection of thermometers.
8. Blood pressure measurment.
9. Pulse rate measurment.
10. Respiratory rate determination.
11. Urine collection for analysis.
12. Taking blood for analysis.
13. Drawing drug inspection book, drug registration.
14. Application of tablets, ointments and powders.
15. Preparation of drug solutions for injection.
16. Injections: types, technique.
17. Dropper assembling and attaching.
18. Dressing stuff preparation and sterilization in drums.
19. Medical personnel clothes disinfection.
20. Surgical equipment disinfection and sterilization.
21. Bed clothes disinfection.
22. Disinfected drums usage.
23. Used dressing materials collection and throwing.
24. Suture material and its disinfection.
25. Hands preparation and disinfection.
26. Operating table preparation. Sets of surgical equipment for eye different operations.
27. Premedications and preoperative preparation.
28. Processing of operating field.
29. Dressings appliance.
30. Patient transference and transport.
31. Patient's bed preparation.
32. Use of functional bed.
33. Patients' postoperative care.
34. Patients' hygienic procedures.
35. Bedsores prophylaxis.
36. Heat compresses appliance.
37. Bedpan usage.
38. Enemas - usage, disinfection.
39. Bladder catheterization.
40. Providing aid to a patient with vomiting.
41. Application of oxygene mask.
42. Bleeding control (arrest).
43. Preparation of patients for X-ray examination.
44. Patients' immobilization.

APPENDIX IV.

CONTINUING EDUCATION IN OPHTHALMOLOGY

Refresher Course for Practicing Ophthalmologists and Primary Health Care Physicians

Aim and Learning Outcomes

Aim: provide theoretical knowledge and practical skills on the contemporary methods of eye diseases prevention, diagnostics and treatment.
In order to achieve the Aim of the course the following Learning Outcomes have been chosen.
By the end of the training course the trainee should:
a. assimilate a complete course of contemporary ophthalmology
b. be master in contemporary methods of diagnosing and treating eye pathologies
c. be familiar to possess eye microsurgery

Constituency

The training course is intended for in-practice ophthalmologists, working in specialized eye clinics, regional ophthalmologic departments and policlinics of Republic of Armenia. Family physicians willing to improve their knowledge in ophthalmology can participate in this course.
A class of 6-10 participants is anticipated.

Rationale

The course is very intensive and short (6 weeks). Because it is short it can be run regularly, impacting the entire eye care, rather than a few specialists. Course is open for in-practice ophthalmologists and family physicians, regardless their citizenship, workplace and age.
The course is affordable. It could be conducted in Armenian, Russian or English depending on participants' choice. The course provides theoretical knowledge as well as practical training.
All the participants who take the exam successfully will be given the certificate recognized by MOH, RA.

Learning Needs of Students

The students are expected to have basic knowledge of eye diseases diagnostics and treatment, as well as visual organ anatomy, physiology and basics of optics.

Teaching Strategy

The training course consists of lectures, practical trainings and group works, conducted in the Medical Centre "Kanaker Zejtun" (8th Eye Clinic) and the American University in Armenia (AUA).

Conceptual Outline and Timetable

The course includes visual organ anatomy, physiology, refraction and optics, contemporary methods of eye examination, conservative and surgical treatment of eye pathologies.
The first two days of the training course are for learning the visual organ development and anatomy. The next four days cover issues of visual organ physiology, optics and refraction. On the 7 and 8th days different methods of visual organ examination, such as external examination, biomicroscopy, ophthalmoscopy, eye Electrophysiological and Ultrasound examinations will be studied. Starting from the 9th day different eye pathologies will be

discussed, including the eye accessory organs, anterior and posterior segment diseases, eye refraction and refractive errors, myopia, cataract, glaucoma, eye injuries and squint. Special attention will be paid on cataract surgery. The four days of the teaching course (from 16th to 19th) will be dedicated to cataracts. During the four days the students will learn congenital and acquired cataracts, peculiarities of surgery in different types of cataract, patient preparation for the cataract surgery. On the 18th day the issues of IOL insertion will be covered. During that four days students will spend most of time in the operating room, participating and assisting in cataract surgery. The days from 20 to 22 are focused on learning the retina and the optic nerve pathologies. The 23- 26th days will cover eye hydrodynamics and hydrostatics, glaucoma classification, clinics and treatment. Starting from the 27th day the eye traumas (injuries, contusions and burns), their complications and primary microsurgical processing will be studied. Day 30th is for binocular vision and squint issues discussion. The 31st day is for individual study and preparation to the examination. On the 32nd day students will take the examination on theoretical knowledge and practical skills.

Description of the Course

Lectures - usually not more than 2 hours long (with 15 min. break), which incorporate also exercises, brainstorming and rounds.

Practical training - (1 or 2 per day) 2 hours long (with 15 min. break), which will be held in different eye departments, dressing and operating rooms. During the practical trainings students will examine patients, perform different diagnostic tests and clinical procedures, monitor patients under the control of course executors. Practical trainings will also include night duties and practicles, followed by self-reflection and evaluation.

Group works - usually 2 hours long (with 15 min. break), which include buzz groups, syndicates, brainstorming, open discussions, rounds and testing as well as presentations (20 minutes long).

Assessment

Students are allowed to the take the examinations after fulfilling the following requirements:

- Attendance

  Absenteeism is not welcomed. Students can miss maximum 3 classes during the whole course of the training.

- Participation in practical trainings

  Students should actively participate in class discussions, practical trainings, independently complete assignments and assist in at least 8 surgeries.

- Participation in night duties/shifts

  Students should be present on night duties with the shift doctor at least 2 times during the whole course of the training. The student must participate in examination and treatment of all patients admitted during the shift.

- Preparation and presentation of papers/essays

  At the beginning of the course student will be provided by a list of topics for presentations. Each student should choose at least 2 topics, conduct the presentation during group work within 15 minutes and answer to the questions of the audience related to the topic.

  The students who do not fulfill above mentioned requirements are not allowed to the course exams.

Final grade

Evaluation and certification depend on the final grade (5-point scale), which comprises of the following:

- average grade of the tests - 20%
- result of the practical skills examination -30%
- result of the theoretical knowledge examination -50%

Terms and conditions of tests

After each section students are tested. Each student is given 10 multiple choice questions. Number of tests is 14, duration of each is 10 minutes, and the grade is based on a 5 point scale. By the end of the course an average final grade is given based on results of the tests.

Terms and conditions of practical skills exam

After the training course the students are given an exam on practical skills. The duration of the exam is 3 hours. At least 3 patients with different eye pathologies are assigned to each of the students. Students should independently examine patients and demonstrate their practical skills of eye examination, confirmation of a diagnosis and treatment of revealed pathologies.

Terms and conditions of theoretical knowledge exam

After the training course the students take an exam on theory. Exam questions are given beforehand. The exam is oral based on question cards. The number of question cards is 20, each contains 5 questions. 30 minutes is given for preparation. The grade is based on 5 point scale system.
The students who pass the course of training, but are not allowed to take the exams, and the students whose final grade is less than 4 points will be given a certificate of attendance. The students, who receive a grade equal to 4 or 5 points, will be given a certificate on professional training.

Learning Time ***6 weeks***

Organizers

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LITERATURE

Main source

Kopaeva V.G. Eye Diseases. Moscow, “Meditsina”, 2002(in Russian).

Recommended Readings

1. Avetisov E.S. Child Vision Protection. Moscow, “Meditsina”, 1975(in Russian).
2. Avetisov E.S., Rozenblum U.Z. Vision Optic Correction. Moscow, “Meditsina”, 1981(in Russian).
3. Avetisov E.S. Myopia. Moscow, “Meditsina”, 1986(in Russian).
4. Avetisov E.S. Convergent Squint. Moscow, “Meditsina”, 1977(in Russian).
5. Ananin V.F. Accommodation and Myopia. Moscow, “Biomedinform”, 1992(in Russian).
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8. Bojningen Van E. Atlas of Goniobiomicroscopy. Moscow, “Meditsina”, 1965(in Russian).
9. Brovkina A.F. Orbital tumors. Moscow, “Meditsina”, 1974(in Russian).
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19. Kacnelson L.A. Clinical Atlas of Fundus Pathology. Moscow,“GEOTAR Meditsina”, 1999(in Russian).
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22. Kasparov A.A. Ophthalmoherpes. “Meditsina”, 1994(in Russian).
23. Krasnov M.L., Shulpina N.B. Therapeutic Ophthalmology. Moscow, “Meditsina”, 1985 (in Russian).

24. Krasnov M.L., Beljaeva V.S. Eye Surgery Manual. Moscow, "Meditsina", 1988 (in Russian).
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26. Malcev E.V. The Lens. Moscow, "Meditsina", 1988(in Russian).
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Journals

1. Bulletin of Ophthalmology. Moscow, Editor-in-Chief Krasnov M.L.
2. Bulletin of Optometry. Moscow, Editor-in-Chief Belousov V.V.
3. Journal of Ophthalmology. Odessa, Editor-in-Chief Logaj I.M.
4. Ophthalmosurgery. Moscow, Editor-in-Chief Fedorov S.N.
5. Ophthalmosurgery and Therapy. Moscow, Editor-in-Chief Dronov I.I.

Websites, on - line guides and journals

1. American Journal of Ophthalmology www.ajo.com – abstracts, subscription.
2. Archives of Ophthalmology http://www.archophtalmol.com – abstracts and articles.
3. American Academy of Ophthalmology http://www.eyenet.org –Information for the professionals and audience.

4. Audio-Digest Ophthalmology http://www.audiodigest.org – ophthalmologic audio courses on tapes and CDs.
5. British Journal of Ophthalmology www.bjophthalomol.com –abstracts, articles, subscription.
6. British Medical Journal http://www.bmj.com/bmj/ - abstracts, subscription.
7. Cyber Anatomy Tutorials http://anatome.ncl.ac.uk/tutorials/404.html - Site contains large information about human anatomy.
8. Cataract Surgery Topics http://mystic.biomed.mcgill.ca/MedinfHome/ZSPROJECTS/Ophthalomolgy/OphthHypertext/Contents.html
9. CSCRS http://www.cscrs.org – Canadian Society of Refractive and Cataract Surgeons.
10. Digital Journal of Ophthalmology http://www.djo.harvard.edu/ -original articles.
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12. Eye World www.eyeworld.org – abstracts, articles.
13. European Journal of Ophthalmology www.hsr.it/ejo/ejo/html - abstracts, articles, multimedia.
14. National Ophthalmologic Project www.eyenews.ru – articles, references, news, journals, subscription.
15. Online Journal of Ophthalmology http://www.onjoph/com/ - On-line journal in English and German.
16. Ophthalmologic Journals On - line http://www.scienceekomm.at/journals/medicine/opth.html - references, search.
17. Journal of Cataract and Refractive Surgery www.ascrs.org- abstracts, subscription.
18. Journal of Glaucoma www.glaucomajournal.com – abstracts, subscription.
19. Review of Ophthalmology www.revophth.com – abstracts, articles.

TOPICS TO BE COVERED

Part 1. Anatomy of the eye and orbit

1. Visual organ and its importance for human life.
2. Ocular development.
3. Anatomy of the orbit and its relationship with paranasal sinuses and cranial cavity. The role
   of that relationship in development of different pathological processes in the orbit.
4. Anatomy of the eye accessory apparatus.
5. Blood supply (vascularisation) of the eye and the orbit.
6. Innervation of the eye and the orbit. The pupil reflex pathway.
7. Eye globe anatomy.
8. Extraocular muscles, anatomy and physiology.
9. Topographic anatomy of Tenon's Capsule.
10. Ciliary ganglion, topographic anatomy. Retrobulbar block technique.
11. Outer layer of the eye: structure and functions.
12. Middle layer of the eye: structure and functions.
13. Inner layer of the eye (retina): structure and functions.
14. Optic nerve: structure and functions.
15. Visual analisator, visual pathways.
16. Eye chambers. Aqueous fluid and its circulation (eye hydrodynamics).
17. Outflow structures. Angle of anterior chamber.
18. Lens: structure and functions. Age-related changes.
19. Vitreous body: composition, structure and functions.

Practical training

Study of the orbit, eye globe and its sustaining apparatus structure on plaster casts and enucleated animal eyes.

Part 2. Visual functions and their examination

1. Visual functions. Connection of eye visual and motor mechanisms.
2. Daylight, twilight vision, photo perception and their examination.
3. Adaptation. Adaptometry and its importance in different eye pathologies diagnostics.
4. Central vision and its measurement unit.
5. Visual acuity testing. Visual charts.
6. Retinal vision acuity (RVA).
7. Macula functions examination (Amsler grid test, maculotester, retinal entopic phenomena).
8. Color vision and its examination. Color characteristics. Congenital and acquired disorders
   of color vision.
9. Peripheric vision, visual field and its borders in norm.
10. Visual field changes in eye pathology and different general diseases.
11. Campimetry: technique, indications.
12. Binocular vision (BV) and its disturbances. Causes of BV disturbances.

Practical training

Mastering and improving the knowledge of visual functions examination methods.

Part 3. Eye refraction. Refractive errors and their correction

1. Optic system and the refractive power of the eye. Anatomical and visual axes of the eye.
2. Clinical refraction: states, subjective and objective methods of examination.
3. Myopia: development, classification, manifestation, treatment, complications.
4. Myopia and pregnancy. Optional and relative indications for Caesarian section.
5. Astigmatism: classification, diagnostics, correction.
6. Accommodation: mechanism, connection with convergence. Absolute and relative accommodation.
7. Length and volume of the accommodation. Near and far points of accommodation in emmetropia, myopia and hyperopia.
8. Pseudomyopia: diagnostics, treatment, prevention. Diff. diagnostics with myopia.
9. Presbyopia, correction in emmetropia, myopia, hyperopia, astigmatism.
10. Refractive errors, methods of correction (eyeglasses, contact and laser correction, intraocular lens implantation).
11. Visual fatigue: symptoms, elimination.

Practical training

1. Different methods of refractive error determination. Cycloplegic drugs.
2. Accommodation and convergence examination.
3. Refractive errors correction, individual approach in choosing the method of correction.
4. Acquaintance with different surgical methods of myopia correction (sclerostrengthening operations, intraocular lens implantation, laser correction).

Part 4. Eye and its accessory apparatus examination

1. External examination of the eye and its accessory apparatus. State of the skin, eyelid margins and eyelashes.
2. Eye globe alignment in the orbit, its motility. Eye-slit shape and size determination.
3. Lacrimal tract functions examination.
4. Methods of illumination during the visual organ examination.
5. Biomicroscopy: methods of illumination.
6. Ophthalmoscopy: direct, indirect.
7. Diaphanoscopy: indications.
8. Gonioscopy, types of gonioscops. The gonioscopic characteristics of anterior chamber angle.
9. Ultrasound examination in ophthalmology.
10. Electrophysiological examinations in ophthalmology.
11. Fluorescent angiography: technique, indications, contraindications, complications.

Practical training

1. Cornea sensitivity examination and its importance in diagnosing different eye pathologies.
2. Intraocular pressure measurement (palpator and instrumental methods).
3. Eye external examination. Examination in direct and lateral illumination.

4. Biomicroscopy, bioophthalmoscopy, ophthalmoscopy, diaphanoscopy.
5. Gonioscopy and electrophysiological examinations.

Part 5. Diseases of eye and its accessory apparatus

5.1. Eyelid diseases

1. Eyelid diseases classification.
2. Eyelid skin diseases.
3. Eyelid margins, meibomian glands and ciliar follicles diseases.
4. Eyelid functions and position abnormalities.
5. Eyelid injuries.

5.2. Diseases of the conjunctiva

1. Conjunctivitis: classification.
2. Bacterial conjunctivitis: diagnostics, manifestation, treatment.
3. Viral conjunctivitis: diagnostics, manifestation, treatment.
4. Trachoma, paratrachoma.
5. Fungal conjunctivitis: diagnostics, manifestation, treatment.
6. Allergic conjunctivitis: diagnostics, manifestation, treatment.
7. Degenerative changes in the conjunctiva: pinguecula, pterygium.

Practical training

1. Carrying patients with conjunctivitis.
2. Performing treatment procedures.

5.3. Diseases of the cornea and sclera

1. Keratitis: classification.
2. Common symptoms of keratitis.
3. Exogenous keratitis.
4. Endogenous keratitis.
5. Bacterial keratitis: diagnostics, manifestation, treatment.
6. Adenoviral keratitis: diagnostics, manifestation, treatment.
7. Herpetic keratitis: diagnostics, manifestation, treatment, complications.
8. Fungal keratitis: diagnostics, manifestation, treatment.
9. Traumatic keratitis: diagnostics, manifestation, treatment.
10. Corneal dystrophies: diagnostics, manifestation, treatment.
11. Cornea shape and size anomalies. Keratoconus: diagnostics, symptoms, treatment.
12. Keratoplasty: types, indications, outcomes.
13. Corneal diseases consequences.
14. Scleritis and episcleritis: diagnostics, manifestation, treatment.

Practical training

1. Carrying patients with cornea and sclera diseases. Analyzing clinical cases.
2. Cornea sensitivity definition.
3. Surgical manipulations on the cornea.

Part 5.4. Diseases of the uvea and vitreous body

1. Uvea development abnormalities.
2. Uveitis: classification.
3. Common symptoms of anterior and posterior uveitis.
4. Iritis, iridocyclitis: diagnostics, symptoms, treatment. Diff. diagnostics with acute attack of angle-closure glaucoma. Urgent aid.
5. Posterior uveitis (chorioretinitis): diagnostics, manifestation, treatment.
6. Intermediate uveitis (panuveitis): diagnostics, manifestation, treatment, complications.
7. Uveopathies.
8. Vitreous body pathology.

Practical training

1. Diagnostics and complex treatment of uveitis.
2. Ways of drug injection in case of uveitis.

Part 5.5. Diseases of the lens

1. Lens development abnormalities.
2. Cataract: classification.
3. Congenital, presenile and senile cataracts.
4. Lens injuries: diagnostics, complications, treatment.
5. Drugs used in cataract treatment.
6. Cataract surgery.
7. Preoperative anesthesia.
8. Intracapsular cataract extraction (ICCE): indications, contraindications, technique, intra- and postoperative complications.
9. Extracapsular cataract extraction with intraocular lens insertion (ECCE+ IOL): indications, contraindications, technique, intra- and postoperative complications.
10. Tunnel cataract extraction: indications, contraindications, technique, intra- and postoperative complications.
11. Phacoemulsification: indications, contraindications, technique, intra- and postoperative complications.
12. Congenital cataract extraction: peculiarities.
13. Application of laser in cataract surgery.
14. Intraocular lenses: different models of IOL. Lens selection.

Practical training

1. Diagnosing and determining the stage of cataract. Choosing the type of surgery.
2. Carrying patients with cataracts. Preoperative evaluation.
3. Premedications, anesthesia, bridle suturing technique.
4. Irrigation/aspiration technique.
5. Eye aseptic bands application.
6. Patients' postoperative care. Postoperative complications and their prevention.
7. Surgical stuff. Surgical sutures: stitching, removing.

Part 5.6. Diseases of the retina

1. General forms of retinal diseases.
2. Retinal vessels (CRV and CRA) occlusions. Urgent aid.
3. Infections, inflammations of the retina (retinitis).
4. Retinopathies (hypertensive, diabetic). Indications for laser treatment of diabetic retinopathy.
5. Visual organ diseases due to HIV- infection: epidemiology, diagnostics, manifestation, prevention.
6. Retinal dystrophies: classification, diagnostics, symptoms, prevention.
7. Retinal detachment: aetiology, classification, diagnostics, diff. diagnostics, symptoms, outcomes, urgent aid. Surgical treatment: methods, indications, contraindications. Laser treatment.

Practical training

1. Carrying patients with retinal diseases.
2. Providing urgent aid to patients with retinal vessels occlusion.
3. Mastering methods of ophthalmoscopy.
4. Laser treatment indications in diabetic retinopathy.

Part 5.7. Diseases of the optic nerve

1. Congenital abnormalities of the optic disc.
2. Optic nerve inflammations (neuritis): aetiology, classification, diagnostics, symptoms, treatment.
3. Optic nerve vascular diseases (ischemic optic neuropathies): aetiology, classification, diagnostics, symptoms, treatment.
4. Papilloedema: aetiology, classification, diagnostics, symptoms, treatment. Complicated papilloedema. Foster-Kennedy syndrome.
5. Diff. diagnostics between papillitis, papilloedema and optic nerve ischemies.
6. Optic nerve atrophy: aetiology, classification, diagnostics, symptoms, treatment.

Practical training

1. Examining patients with optic nerve and visual pathways diseases.
2. Carrying patients with optic nerve diseases.
3. Mastering instrumental methods of diagnosing the optic nerve pathology.
4. Mastering different methods of injections used in eye pathology.

Part 5.8. Glaucoma

1. Intraocular fluid (IOF). Intraocular pressure (IOP).
2. Eye hydrodynamics and hydrostatics.
3. Glaucoma classification.
4. Gonioscopic changes of anterior chamber angle in different forms of glaucoma.
5. Congenital and juvenile glaucoma: aetiology, diagnostics, symptoms, treatment.
6. Primary open-angle and angle-closure glaucoma.
7. Low pressure (normotensive) glaucoma.

8. Types of blocks in case of angle-closure glaucoma. Acute attack of angle-closure glaucoma urgent aid.
9. Secondary glaucoma, classification:
    - Uveitic glaucoma, Fuch's syndrome
    - Phacogenic glaucoma, types
    - Vascular glaucoma
    - Traumatic glaucoma
    - Postoperative glaucoma. Aphacic glaucoma
    - Neoplastic glaucoma
10. Ophthalmohypertensions: diff. diagnostics with glaucoma.
11. Management and treatment of glaucoma (main drug groups).
12. Glaucoma surgery: means of surgery, indications, contraindications.
13. Glaucoma laser treatment: indications and contraindications.
14. Glaucoma patients' work and life regimen.
15. Importance of prophylactic inspections for glaucoma revelation.

Practical training

1. Carrying patients with glaucoma.
2. IOP measurement (tonometry, tonography, elastotonometry). $P_{tonometric}$, $P_{tolerative}$, $P_{veritable}$, F, C, KB in norm and changes in glaucoma.
3. Providing gonioscopy, perimetry.
4. Glaucoma stage and compensation degree definition.
5. Urgent aid in acute attack of angle-closure glaucoma.
6. Assistance during glaucoma surgery.
7. Optic nerve alcoholization: indications and technique.

Part 5.9. Eye injuries

1. Eye globe and eye accessory apparatus injuries: classification.
2. Penetrating and non-penetrating injuries to the eye. Absolute and comparative signs of eye penetrating injuries with foreign body insertion.
3. Intraocular foreign body diagnostics.
4. Intraocular foreign body location definition (Comberg-Baltin's prosthesis, Poliak's measuring tables).
5. Eye penetrating injuries with foreign body insertion: complications. Indications for intraocular foreign body removal.
6. Sympathetic ophthalmitis: diagnostics, symptoms, treatment, prevention.
7. Endophthalmitis, panophthalmitis: conservative and surgical treatment.
8. Enucleation, evisceration, exenteration. Indications for artificial eye, its characteristics and care.
9. Eye globe contusions: classification, diagnostics, symptoms, treatment, outcomes.
10. Eye burns: classification, general principles of treatment, urgent aid.

Practical training

1. Urgent aid to patients with eye injuries.
2. Primary microsurgical processing of eye wounds.
3. Zejdel's test producing.
4. Getting acquainted with instrumental methods of diagnosing the intraocular foreign body.

Part 5.10. Squint

1. Binocular vision: disturbances and the causes of disturbances.
2. Corresponding and non-corresponding points of retina, Horopter's circle, Panum's zone.
3. Convergence and its role in the act of binocular vision.
4. Eye fusion ability. Reserves of fusion.
5. Types of squint: apparent, latent, manifested.
6. Convergent squint.
7. Paralytic squint: causes, symptoms, surgical treatment.
8. Amblyopia: classification, treatment.
9. Squint treatment: Indications for surgical treatment.

Practical training

1. Carrying patients with squint.
2. Acquiring skills of examining binocular vision, eye motility and extraocular muscles functions, eye fusal ability, fixation, measuring squint angle.

TRAINING PROGRAM FOR OPHTHALMOLOGISTS

TIMETABLE

Day	Session/ Theme	Staff	Place
1.	9:45-11:45 L1: Anatomy of the orbit and eyeball. Visual organ vascular supply and innervation. 12:00-14:30 PT: Studying the orbit and eyeball anatomy on plaster casts and schemes. 14:40-16:15 GW: Discussion of the lecture material.	ASh ASh ASh	Audi-torium
2.	9:45-11:45 L2: Eyeball contents. The eye accessory apparatus anatomy. 12:00-14:30 PT: Studying the eye accessory apparatus anatomy on plaster casts, schemes and tables. 14:45-16:20 GW: Discussion of the lecture material.	ASh ASh ASh	Aud.
3.	9:45-11:45 L3: Visual organ physiology. Visual functions, their examination. 12:00-14:30 PT: Improving and mastering means of visual functions exam. 14:45-16:20 GW: Discussion of the lecture material.	SB SB SB	Aud.
4.	9:45-13:00 PT: Improving visual functions examination skills. 13:30-16:20 GW: Methods of visual functions examination.	SB SB	Aud.
5.	9:45-11:45 L4: Optic system of the eye. Myopia, accommodation palsy. Hyperopia. 12:00-14:30 PT: Eye accommodation and convergence examination. 14:45-16:20 GW: Discussion of the lecture material.	LB	Aud.
6.	9:45-11:45 L5: Refractive errors correction. 12:00-14:30 PT: Subjective and objective methods of refractive errors determination. 14:45-16:20 GW: Cycloplegy. Cycloplegic drugs.	LB	Aud.
7.	9:45-11:45 L6: Eye and its accessory apparatus examination. 12:00-14:30 PT: Biomicroscopy, ophthalmoscopy, diaphanoscopy. 14:45-16:20 GW: Types of illumination in biomicroscopy. Ophtalmochromoscopy.	ET-A VH VH	Aud.
8.	9:45-10:45 GW: Electrophysiological (EPh) and Ultrasound examinations in ophthalmology. 11:00-14:30 PT: Participation in EPh and Ultrasound examinations. 14.15-16:20 GW: Discussion of EPh and Ultrasound examinations' results.	ASh	
9.	9:45-11:45 L7: Eyelid diseases. Eyelid position and function abnormalities. 12:00-14:30 PT: Eye external examination. 14:45-16:20 GW: Discussion of the lecture material.	ET-A	Aud.
10.	9:45-11:45 L8: Conjunctivitis. 12:00-14:30 PT: Treating procedures in conjunctivitis. 14:45-16:20 GW: Discussion of the lecture material.	AG	Aud.

11.	9:45-11:45 L9: Degenerative changes in the conjunctiva. 12:00-14:30 PT: Pterygium surgery. 14:45-16:20 GW: Discussion of the lecture material.	AG	Aud.
12.	9:45-11:45 L10: Keratitis, scleritis, episcleritis. 12:00-14:30 PT: Surgical manipulations on the cornea. 14:45-16:20 GW: Discussion of the lecture material.	AG	Aud.
13.	9:45-11:45 L11: Cornea shape and size anomalies. Corneal dystrophies. Keratoconus. Keratoplasty. 12:00-14:30 PT: Keratometry. Assistance in cornea surgery. 14:45-16:20 GW: Discussion of the lecture material. Types of keratoplasty.	AG	Aud.
14.	9:45-11:45 L12: Uvea development abnormalities. Anterior uveitis. 12:00-14:30 PT: Carrying patients with uveitis. 14:45-16:20 GW: Discussion of the lecture material.	AG	Aud.
15.	9:45-11:45 L13: Posterior uveitis. Vitreous body pathology. 12:00-14:30 PT: Examination and treatment of patients' with uveal pathology. 14:45-16:20 GW: Uveitis concomitant to general diseases and syndromes.	ET-A	Aud.
16.	9:45-11:45 L14: Lens development abnormalities. Congenital and acquired cataracts. 12:00-14:30 PT: Cataract patients' examination. 14:45-16:20 GW: Discussion of the lecture material.	LB	Aud.
17.	9:45-11:45 L15: Cataract surgery. Usage of laser and ultrasound in cataract surgery. 12:00-14:30 PT: Patients' preoperative preparation and premedications. Assistance in cataract surgery. 14:45-16:20 GW: Discussion of the lecture material. Application of laser in ophthalmology.	LB	Aud. Oper. room
18.	9:45-10:45 GW: IOL insertion. 11:00-15:30 PT: Assistance in cataract surgery. 15:15-16:20 GW: Types and selection of IOL.	AG/LB/ ETA	Oper. room
19.	9:45-10:45 GW: First dressing of operated patients, preoperative preparations and premedications. 11:00-15:30 PT: Assistance in cataract surgery. 15:15-16:20GW: Cataract surgery complications.	ET-A	Oper. room
20.	9:45-11:45 L16: General forms of retinal diseases. 12:00-14:30 PT: Retinal functions' examination. 14:45-16:20 GW: Discussion of the lecture material.	SB	Aud.
21.	9:45-11:45 L17: Retinal dystrophies. Retinal detachment. 12:00-14:30 PT: Examination of patients' with retinal pathologies. 14:45-16:20 GW: Discussion of the lecture material.	AG ET-A	Aud.

22.	9:45-11:45 L18: Inflammatory and vascular diseases of the optic nerve. Optic nerve atrophies. 12:00-14:30 PT: Mastering instrumental methods of diagnosing the optic nerve pathologies. Carrying patients with the optic nerve pathology. 14:45-16:20 GW: Discussion of the lecture material.	AH	Aud.
23.	9:45-11:45 L19: Glaucoma classification. Gonioscopy of the anterior chamber angle. 12:00-14:30 PT: Gonioscopy. 14:45-16:20 GW: Discussion of the lecture material.	AH	Aud.
24.	9:45-11:45 L20: Glaucoma diagnostics. Eye hydrodynamics and hydrostatics. 12:00-14:30 PT: Tonometry, tonography, perimetry, ophthalmoscopy. 14:45-16:20 GW: Discussion of the lecture material.	AH SB	Aud.
25.	9:45-11:45 L21: Secondary glaucoma. Management and treatment of glaucoma. 12:00-14:30 PT: Carrying and treating patients with secondary glaucoma. 14:45-16:20 GW: Discussion of the lecture material.	ASh AO	Aud.
26.	9:45-11:45 L22: Glaucoma surgery. Usage of laser. 12:00-14:00 PT: Assistance in glaucoma surgery. 14:30-16:20 GW: Discussion of the lecture material.	AH	Aud.
27.	9:45-11:45 L23: Eye injuries. Classification of eye globe and eye accessory apparatus injuries. 12:00-14:30 PT: X-ray diagnostics in eye injuries. 14:45-16:20 GW: Discussion of the lecture material.	AA	Aud.
28.	9:45-11:45 L24: Complications of eye penetrating injuries. Sympathetic ophthalmitis. Primary microsurgical processing. 12:00-14:00 PT: Assisting in surgery (enucleation, evisceration). 14:00-16:20 GW: Discussion of the lecture material.	AA	Aud.
29.	9:45-11:45 L25: Eye contusions. Eye burns. 12:00-14:30 PT: Carrying and treating patients with eye contusions and burns. 14:15-16:20 GW: Discussion of the lecture material.	AA ET-A	Aud. Aud.
30.	9:45-11:45 L26: Binocular vision and its disturbances. Convergent and paralytic squint. 12:00-14:30 PT: Examination of patients' with squint. 14:45-16:20 GW: Discussion of the lecture material.	LB	Aud.
31.	**Individual Study- Preparation for the examination.**		
32.	**10:00-13:00 Examination on practical skills.** **14:00-17:00 Oral examination on theory.**		Aud.

Abbreviations

LB - Levon Barseghyan
AH - Alla Hovhanessyan
SB - Svetlana Bakhshinova
AA - Adrine Avetisyan
ET-A - Eduard Ter-Andriasov
AG - Aharon Gabrielyan
ASh - Ara Sharambekyan
VH - Varsik Hakobyan

AChA - anterior chamber angle
Aud. - auditorium
BV - binocular vision
CRA - central retinal artery
CRV - central retinal vein
EPhE - electrophysiological examination
ERG - electroretinography
FAG - fluorescent angiography
IOL - intraocular lens
IOF - intraocular fluid
IOP - intraocular pressure
IOFB - intraocular foreign body
PMSP - primary microsurgical processing
RVA - retinal vision acuity

TRAINING PROGRAM FOR OPHTHALMOLOGISTS

Session plan for Day 1

9:30 - 9:45 Participation in the morning round.

9:45 - 10:00 Presentation of the training course by the course organizers.
Present the aims, objectives, duration, content and course of the training.
Introduce to the students the course executors. Ask students to present their suggestions regarding the training course and teaching methods. Answer to their questions. Find out the most important topics for them to introduce respective changes into the training course.
Suggest to students a list of presentations (see Appendix 1), explain how and when they will be conducted. Give to the students the opportunity to choose the topic of their interest.
Ask them to make the list of presentations and submit it to the course organizers by the next morning.

10:00 - 10:15 Introduction. Lecturer – A. Sharambekyan
The lecturer and students introduce themselves. The lecturer asks each trainee to introduce him/her briefly and to tell what he/she anticipates from the course.

Help students to get acquainted with each other for more efficient training.

10:15 - 11:00 Lecture (L) 1 (1): The orbit and eye globe anatomy. Ocular development.
The orbital walls. Orbital foramina, ducts, canals, fissures. Anatomic units passing threw them. Peculiarities of orbital walls and their role in orbital pathologies development and dissemination. Ocular development. Outer layer of the eye: anatomy, histology, functions. Corneal topography. Middle layer: anatomy, histology, functions. Inner layer of the eye (retina): anatomy, histology, functions.
Eye drainage structures: chambers, anterior chamber angle (AChA). Lens anatomy, histology, functions, age related changes. Vitreous body: anatomy, functions.

11:00 - 11:10 Break

11:10 - 11:45 L1 (2): Visual analisator. Vascularization and innervation of the eye.
Visual analisator: peripheral and central parts, cortical and subcortical centers.
Optic nerve: its structure, topographical areas, arrangement of neurofibres.
The pupil reflex pathway.

Question for discussion: What peculiarities of orbital veins contribute to infection dissemination in the skull cavity?

11:45 - 12:00 Break

12:00 - 13:00 Practical training (PT) (1): Explain the structure of the orbit on plaster casts, schemes and enucleated animal eyes.

Question for discussion: Which of the orbital walls are the most sensitive for the development of an orbital pathology?

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Studying innervation and vascularization of the eye on schemes and the atlas.

14:30 - 14:40 Break

14:40 - 15:30 Group work GW (1): Discuss the lecture material on the following topics:
Structure peculiarities of the bony orbit. Foramens and fissures connecting the orbit with the skull. Eye globe anatomy. Topographic anatomy of ganglion cilliare. Tenon's capsule: topographic anatomy, outer and inner layers.

15:30 - 15:40 Break

15:40 - 16:15 GW (2): Continue discussion of the lecture material on the following topics:
Blood supply, innervation of the eye, muscles and the lacrimal gland. Upper orbital fissure syndrome. Total and partial ophthalmoplegy. Peculiarities of the eye venous system, its relationship in dissemination of pathologies. Vortex veins: topographic anatomy, functions. Visual analisator. The pupil reflex pathway.

16:15 – 16:25 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work and the importance of discussed topics in terms of their practical application in ophthalmology using 10 point scale system.

16:25-16:30 Make a night duties' table.
Each student must have 2 night duties per course. The night duties will be followed by self-reflection and evaluation (five minutes during the morning round on the next day will be given for it). Provide student a list of topics for presentation. Each student has to choose at least 2 topics.

Session plan for Day 2

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L2 (1): The contents of the orbit. Anatomy of the eye accessory apparatus.
Lecturer – A. Sharambekyan
Fascia tarsoorbitalis. Eyelids: structure and functions. Conjunctiva of the eyeball and eyelids, cul-de-sac conjunctiva. Lacrimal system: main and accessory lacrimal glands. Lacrimal excretory system.

10:45 - 11:00 Break

11:00 - 11:45 L2 (2): Extraocular muscles.
Extraocular muscles: structure and functions.

Questions for discussion: How the eyeball is fixed in the orbit?
The importance of fascia tarsoorbitalis in dissemination of eye inflammations.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Together with students study anatomy of the eye accessory apparatus on plaster casts and schemes. Show the technique of eyelid evertion, washing the conjunctival sac, and cauterization of the conjunctiva. Present parabulbar and subconjunctival injections. Assess the functions of eye muscles.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Perform lacrimal system diagnostic tests: Schirmer's test, duct and nasolacrimal fluorescein tests.
Show students the X-ray images of lacrimal ducts' pathologies.

Give students an assignment to determine on the images localization of lacrimal ducts' obturation.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Study the lecture material on the following topics:
Extraocular muscles: straight and oblique muscles, synergists and antagonists. The eyelids: skin-muscular and mucotarsal plates. Eyelid muscular system. Peculiarities of eyelid blood supply and its clinical importance.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Quiz students on the following topics: Lacrimal organs: topographic anatomy and functions. Main and accessory lacrimal glands. Tear: composition, excretion, structure of tear membrane. Lacrimal excretory system. Topographic anatomy of nasolacrimal duct.

16:10- 16:20 Testing the students on topics of the 1 and 2nd days.

16:20 – 16:30 Discussion and summarizing the study material.

Ask students to present in written their comments regarding the training day, and to evaluate the quality of the lecture, the practical training, the group work, and the importance of discussed topics in terms of their practical application in ophthalmology using 10 point scale system.

Literature for 1-2nd days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 24-63.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. I , Book 1, Part 2, P. 137-239.

Gorbani A.I, Djaliashvili I.A. Eye Microsurgery: Mistakes and Complications. Saint – Petersburg, "Hippocrates", 1993, P. 11-60.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 1, P. 4-37.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 2: Anatomy. (P. 3-92).

Session plan for Day 3

9:30 - 9:45 Participation in the morning round.

9:45 - 10:00 Introduction. Lecturer – S. Bakhshinova
The lecturer and students introduce themselves. The lecturer asks each trainee to introduce him/her briefly.

10:00 – 10:45 L3 (1): The eye physiology. Visual functions, methods of examination.
Daylight, twilight vision, night vision, photo perception. Central, color and peripheral vision. Binocular vision. Adaptation: light and dark visual adaptation.

10:45 - 11:00 Break

11:00 - 11:45 L3 (2): Methods of visual function examination.
Visometry, perimetry, anomaloscopy, adaptometry, and campimetry.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany students to the functional examination room. Perform the following examinations: visometry using different charts (Snellen's, Sivtsev's and Landollt's charts), and perimetry. Assess the functional condition of the retina, examine entopic phenomena by Amsler's grid test and maculotester, and define the character of binocular vision.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Give opportunity to the students to examine visual field by their own in different patients, using also control method of visual field examination, with subsequent evaluation of its boundaries and drawing conclusions regarding visual field defects.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Study the lecture material on the following topics:
Areas of the retina responsible for central, peripheral vision and color perception. Age related characteristics of visual acuity. Presbyopia. Disturbances of binocular vision.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Discuss the lecture material on the following topics:
Types of perimetry: kinetic, static and selective. Classification of visual field defects.

Give the following assignment:
Distribute to students the results of perimetry in different patients. Ask the students to evaluate the visual maps, and to present in written clinical signs and probable diagnosis.

16:20 – 16:30 Discussion and summarizing the study material.

Session plan for Day 4

9:30 - 9:45 Participation in the morning round.

9:45 – 11:00 PT (1): Training in the functional examination room.
Trainer – S.Bakhshinova
Explain and present the methodology of campimetry and the examination of color vision by anomaloscope.

11:00 - 11:30 Break

11:30 - 13:00 PT (2): Explain and present the methodology of adaptometry. Draw adaptometric curves.

13:00 - 13:30 Lunch

13:30 - 15:00 GW (1): Discuss the lecture material on the following topics:
Campimetry: indications and contraindications. Sizes of blind spot in norm and changes in different eye pathologies. Disturbances of color vision: congenital, acquired, abnormal trichromasia, dichromasia, monochromasia.

15:00 – 15:30 Break

15:30 - 16:10 GW (2): Quiz students on the following topic:
Adaptation, adaptometry. Changes of adaptometric curves in different eye pathologies.

16:10 - 16:20 Testing the students on topics of the 4th day.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 3-4th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, “Meditsina”, 2002 , P. 63-84.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. I , Book 1, Part 4, P. 323-502 / Vol. I , Book 2, Part 2, P. 105-96.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, “Phoenix”, 2000, Part 2, P. 37-69 / Part 3, P. 69-88.

Shamshinova A.M., Volkov V.V. Functional Methods of Investigation in Ophthalmology. Moscow, “Meditsina”, 1999, Parts 2 / 4, P. 32-133.

Session plan for Day 5

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L4 (1): Eye physiology and optics. Refraction and accommodation.
Lecturer – L.Barseghyan
Transmittance of light by the optic media. The optic system and refractive states of the eye. Accommodation and convergence.

10:45 - 11:00 Break

11:00 - 11:45 L4 (2): Myopia, pseudomyopia. Astigmatism.
Myopia: aetiopathogenesis, classification, clinical course, treatment, complications, prevention. Pseudomyopia. Astigmatism: classification (types, subtypes and stages).

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Ask students to determine clinical refraction of each other, evaluate condition of accommodation and convergence, and define reserves of relative accommodation. Assign patients to students for pupil dilatation and performing sciascopy (retinoscopy).

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Ask students to perform sciascopy (retinoscopy). Together with students conduct diagnostic tests to reveal accommodation spasm.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture topic.
Ask students to present objective and subjective methods of clinical refraction examination. Together with them, on a board, develop a table of cycloplegic drugs, indicating the main groups of cycloplegics, duration of their action, indications and contraindications for their usage.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to myopia. The following topics will be suggested to the students:
1. Myopia surgery.
2. Myopia and pregnancy.
3. Contemporary methods of refractive errors correction.
Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 6

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L5 (1): Correction of refractive errors. Lecturer – L. Barseghyan
The main principles of glass correction. Different methods of refractive errors correction: contact, laser, intraocular correction.

10:45 - 11:00 Break

11:00 - 11:45 L5 (2): Presbyopia. Correction of presbyopia in different types of clinical refraction, in astigmatism.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Assign patients with different types of clinical refraction to students for lens correction. Ask students to write down the results for discussion during the group work.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Assign patients with astigmatism and presbyopia for lens correction. Ask students to assess the power of optic lenses (spherical, cylindrical) using lensmeter.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material.
Ask students to present the methods of refractive errors' correction. Discuss advantages and disadvantages of each method. Show them the usage of cross cylinder (lens axis and power determination tests).

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Distribute to students refraction problems, give them 15 minutes to solve them, and discuss the results. Distribute prescription blanks and ask students to fill them.

16:10- 16:20 Testing the students on topics of the 5 and 6th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 5-6th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 84-129.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. I, Book 1, Part 3, P. 39-314.

Danilichev V.F. Contemporary Ophthalmology. Manual For the Physicians. S.-Petersburg, "Piter", 2000, Part 15, P. 531-548.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 4, P. 88-104.

Rozenblum U.Z. Optometry. Saint – Petersburg, "Hippocrates", 1996.

Avetisov E.S., Rozenblum U.Z. Vision Optic Correction. Moscow, "Meditsina", 1981.

Avetisov E.S. Myopia. Moscow, "Meditsina", 1986.

Avetisov E.S. Child Vision Protection. "Meditsina", 1975.

Ananin V.F. Accommodation and Myopia. Moscow, "Biomedinform", 1992.

Vatchenko A.A. Accommodation Spasm and Myopia. Kiev, "Zdorov'ja", 1977.

Shakaryan A.A., Muradyan A.I. Diagnostics, Complex Treatment and Prevention of Myopia in Children. Yerevan, 1989.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 3: Optics, Refraction & Contact Lenses.(P. 105- 171 & 207- 215).

Session plan for Day 7

9:30 - 9:45 Participation in the morning round.

9:45 - 10:00 Introduction. Lecturer –E.Ter-Andriasov
The lecturer introduces himself. The lecturer asks each trainee to introduce him/her briefly.

10:00 - 10:45 L6 (1): Examination of the eye and its accessory apparatus.
Examination using different types of illumination. Biomicroscopy. Ophthalmoscopy (direct, indirect), ophthalmochromoscopy, diaphanoscopy.

10:45 - 11:00 Break

11:00 - 11:45 L6 (2): Eye Electrophysiological and Ultrasound examinations. Lecturer – A. Sharambekyan

Send students to Garo Meghrigian Eye Institute for Preventive Ophthalmology for practical training and group work.

11:45 – 12:15 Break

12:15 - 13:00 PT (1): Accompany the students to dressing room. Executer – V. Hakobyan
Ask students to examine the eye and its accessory apparatus in each other. Write on the paper the results, and discuss them on the group work.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Assign patients for conducting direct and indirect ophthalmoscopy. Ask students to describe the fundus, and to confirm a diagnosis based on revealed changes.

14:30 - 14:45 Break

14:45 – 15:30 GW (1): Ask about different types of illumination in biomicroscopy. Discuss in details ophthalmoscopy. Define indications for conducting diaphanoscopy.

15:30 -15:45 Break

15:45 - 16:20 GW (2): Discuss the results of the practical training.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for day 7th of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 129-153.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part II, P. 21-36.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. I, Book 2, P. 9-101.

Vodovozov A.M. Eye Examination in Transformed Light. Moscow, "Meditsina", 1986, P. 10-47.

Vodovozov A.M. Ocular Fundus Reflexes. Moscow, "Meditsina", 1980.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 2, P. 37-69.

Fridman F.E., Gundorova R.A., Kozlov M.B. Ultrasound in Ophthalmology. Moscow, "Meditsina", 1989.

Session plan for Day 8

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 GW (1): Executer – A. Sharambekyan
Discuss the methods of Electrophysiological and Ultrasound diagnostics in ophthalmology. Ask about indications and contraindications of above mentioned examinations.

10:45 - 11:00 Break

11:00 - 12:45 PT (1): Accompany students to the Electrophysiological examination (EPhE) room and together with them consult patients. Ask students to participate in preparation of patients for EPhE. During the examination present the aims, objectives and technique of implementation of EPhE.

12:45 – 13:15 Lunch

13:15 - 14:30 PT (2): Accompany students to the Ultrasound examination room and together with them consult patients. During the examination show on the ultrasound pictures revealed eye pathologies. Ask students to confirm a diagnosis based on the results of the ultrasound examination.

14:30 - 14:45 Break

14:45 - 16:10 GW (2): Presentation and discussion.
Presentation related to Electrophysiological and Ultrasound examinations in ophthalmology. The following topics will be suggested to the students:
1. Electrophysiological examinations in eye diseases diagnostics.
2. Ultrasound examination in ophthalmology.
Presentation will be followed by the feedback from the group and facilitator.

16:10- 16:20 Testing the students on topics of the 7 and 8th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for day 8th of the course:

Shamshinova A.M., Volkov V.V. Functional Methods of Investigation in Ophthalmology. Moscow, “Meditsina”, 1999, Parts 5/ 8, P. 133-263.
Vodovozov A.M. Eye Examination in Transformed Light. Moscow, “Meditsina”, 1986, P.68-97.
Kacnelson L.A. Clinical Atlas of Fundus Pathology. Moscow, “GEOTAR Meditsina”, 1999, Part 1,P. 6-22.
Danilichev V.F. Contemporary Ophthalmology. Manual For the Physicians. S.-Petersburg, “Piter”, 2000, Part 6, P. 210-234.
Fridman F.E., Gundorova R.A., Kozlov M.B. Ultrasound in Ophthalmology. Moscow, “Meditsina”, 1989.

Session plan for Day 9

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L7 (1): Eyelid diseases. Lecturer – E.Ter-Andriasov
Classification of eyelid diseases. Diseases of the eyelid skin, cilliary margins, meibomian glands. Blepharitis, meibomitis, sty (hordeolum), chalazion.

10:45 - 11:00 Break

11:00 - 11:45 L7 (2): Eyelid development and position disorders.
Ectropion, entropion, ptosis. Disorders of the eye caused by Demodex folliculorum. Eyelid cysts.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Refer students to the dressing room. Prepare several patients with eyelid pathologies, and together with students perform the following medical procedures: external examination, eyelid massage, drug application on cilliary margins, eyelid evertion using different methods, coaterization of the eyelid conjunctiva.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Refer students to the operating room. Give them opportunity to assist in surgeries on the eyelids: opening of an eyelid abscess and cyst, removal of hordeolum and chalazion.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics: eyelid diseases herpetic affection, eczema, simple, ulcerative and meibomian blepharitis, meibomitis, eyelid cysts, hordeolum, chalazion: etiopathogenesis, diagnostics, clinical course and treatment.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Continue discussion of the lecture material on the following themes: ectropion, entropion: etiopathogenesis, diagnostics, clinical course, treatment; eyelid traumas: burns, injuries/wounds, contusions.

16:10- 16:20 Testing the students on topic of the 9th day.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for day 9th of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002 , P. 153-168.

Arkhangelskiy V.N. Eye Diseases Manual. Moscow, MEDGIZ, 1962, Vol. II,Book 1, Part 1, P. 9-42.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 5, P. 104-128.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part III, P. 36-42.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 2, P. 27-51.

Session plan for Day 10

9:30 - 9:45 Participation in the morning round.

9:45 - 10:00 Introduction. Lecturer – A.Gabrielyan
The lecturer and the students introduce themselves. The lecturer asks each trainee to introduce him/her briefly.

10:00 - 10:45 L8 (1): Conjunctivitis.
Classification of conjunctivitis. Bacterial conjunctivitis: pneumococcal, diplobacillar, diphteritic, gonorrheal. Gonobleonorrhea of newborns.

10:45 - 11:00 Break

11:00 - 11:45 L8 (2): Viral conjunctivitis.
Molluscum contagiosum, epidemic hemorrhagic conjunctivitis, acute epidemic adenoviral conjunctivitis, pharingoconjunctival fever, herpetic conjunctivitis.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Refer students to the dressing room. Together with students perform the following medical procedures: washing of the conjunctival sac, applying eye drops, eye ointments, eye drug membranes and tampons.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Accompany students to the laboratory to get acquainted with the technique of taking an eye culture for bacteriological analysis.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topic: acute and chronic bacterial conjunctivitis.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Continue discussion of the lecture material on the following themes: acute and chronic viral conjunctivitis. Ophthalmoherpes: classification, clinical course, antiviral agents, microsurgical and laser treatment.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 11

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L9 (1): Conjunctivitis. Lecturer – A.Gabrielyan
Allergic conjunctivitis: phlyctenular, follicular, atopic. Vernal/spring conjunctivitis: classification, etiopathogenesis, epidemiology, clinical course, treatment. Mycotic conjunctivitis.

10:45 - 11:00 Break

11:00 - 11:45 L9 (2): Dystrophies of the conjunctiva.
Pinguecula, pterygium, xerosis. Trachoma, paratrachoma: etiopathogenesis, clinical course, outcomes. Differential diagnostics of scrophulous and trachomatous pannus.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Refer students to the operating room. Allow them to assist in surgical removal of pterygium and pinguecula.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Accompany students to the operating room for the participation in patients' examination and to perform treating procedures.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics: allergic conjunctivitis, vernal conjunctivitis: classification, etiopathogenesis, epidemiology, clinical course, treatment. Mycotic conjunctivitis.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Continue discussion of the lecture material on the following topics: trachoma, paratrachoma, differential diagnostics of trachoma with paratrachoma and trachomalike conjunctivitis.

16:10 - 16:20 Testing the students on topics of the 10 and 11th days.

16:20 - 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 10-11th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 180-197.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962 Vol. II, Book 1, Part 2, P. 46-169.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 6, P. 128-154.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part IV, P. 42-69.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 3, P. 51-87.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 8: External Diseases and Cornea.(Part 8).

Session plan for Day 12

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L10 (1): Keratitis (part 1). Lecturer – A.Gabrielyan
Classification of keratitis. Viral keratitis: herpetic, adenoviral.

10:45 - 11:00 Break

11:00 - 11:45 L10 (2): Keratitis (part 2). Scleritis, episcleritis.
Bacterial keratitis: tuberculous, diplobacillar, streptococcal, staphylococcal, pneumococcal. Keratomycosis.
Scleritis, episcleritis: diagnostics, clinics and treatment.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Ask the students to perform cornea sensitivity test in patients with keratitis, to dye the cornea and perform biomicroscopy.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Accompany students to the operating room for participation in cornea surgery.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss exogenous and endogenous keratitis. Quiz students on the following topics: common symptoms of keratitis, stages of corneal ulceration, complications and consequences of keratitis.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to keratitis. The following topics will be suggested to the students:
1. Herpetic keratitis.
2. Differential diagnostics between keratitis of different aetiology.

Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 13

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L11 (1): Cornea shape and size abnormalities. Keratoconus.
Lecturer – A. Gabrielyan
Aetiopathogenesis, classification and treatment of keratoconus.

10:45 - 11:00 Break

11:00 - 11:45 L11 (2): Primary and secondary dystrophies of the cornea. Keratoplasty.
Types of keratoplasty, indications and contraindications.

Ask the students what do they know about transplantation services in Armenia?

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Ask the students to examine each others' cornea with slit lamp and tell about types of illumination during biomicroscopy of the cornea.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Assign patients with corneal abnormalities and dystrophies. Allow students to examine patients and confirm a diagnosis.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Ask the students to tell the aetiopathogenesis, clinics, treatment and consequences of keratoconus. Present data about keratoconus epidemiology in Armenia. Draw students' attention to the importance of early diagnostics of keratoconus. Discuss corneal dystrophies. Pay special attention to aetiology endothelial-epithelial dystrophy. Ask students about the management and treatment of corneal dystrophies.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Presentation and discussion.
Presentation related to keratoconus and keratoplasty. The following topics will be suggested to the students:
1. Types and technique of keratoplasty.
2. Keratoconus: early diagnostics and treatment.
Presentation will be followed by the feedback from the group and facilitator.

16:10- 16:20 Testing the students on topics of the 12 and 13th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 12-13th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 197-245.
Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 5, P. 100-147.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. II, Book 1, Parts 4/ 5, P. 208-299.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 8, P. 159-192.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part V, P. 69-101.

Kasparov A.A. Ophthalmoherpes. "Meditsina", 1994, Part 5, P. 177-210.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 8: External Diseases and Cornea. (Parts 1, 3 and 8).

Session plan for Day 14

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L12 (1): Uvea pathology. Anterior uveitis. Lecturer – A.Gabrielyan
Classification of uvea diseases. Common symptoms of anterior uveitis.
Iritis, iridocyclitis: aetiology, diagnostics, clinics, treatment and outcomes.

10:45 - 11:00 Break

11:00 - 11:45 L12 (2): Uvea development disorders. Non-infective uveitis.
Coloboma, aniridia, polycoria, corectopia.
Non-infective anterior uveitis- acute recurrent iridocyclitis, Behcet's disease, Bekhterev's disease, Fuch's heterochromia, Still's disease.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Together with the group examine patients with uveitis.
Allow the students to:
- perform different injections (subconjunctival, parabulbar),
- apply drug tampons into conjunctival sac.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Continue treating procedures in patients with uveitis.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics:
Common symptoms of anterior uveitis, acute and chronic iridocyclitis: clinics and treatment.

Questions for discussion: uveal tract structure Peculiarities and their role in development and dissemination of uveal pathologies.

Ask students about the differential diagnostics between acute iridocyclitis and acute attack of angle- closure glaucoma.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Discuss uveopathies: Fuch's heterochromia**,** Frank-Kaminecky's dystrophy (clinics and diff. diagnostics).

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 15

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L13 (1): Posterior uveitis. Lecturer – E.Ter-Andriasov
Common symptoms of posterior uveitis. Local and diffuse choroiditis. Panuveitis: classification, diagnostics, clinics and treatment.

10:45 - 11:00 Break

11:00 - 11:45 L13 (2): Vitreous body pathology.
Haziness of vitreous body. Vitreous hemorrhages, hemophthalmos. Indications for vitrectomy.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany the students to the dressing room.
Together with students examine patients with posterior uveitis. Allow the students to perform biomicroscopy, ophthalmoscopy and perimetry of patients.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Continue examination and treatment of patients with uveitis.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics:
Uveitis due to endogenous infections: tuberculosis, syphilis, cytomegalovirus.

Ask the students to tell about differential diagnostics between local and disseminated horoiditis.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Discuss the lecture material on the following topics:
Haziness, destructions and hemorrhages of vitreous body: classification, diagnostics, clinics and treatment.

16:10- 16:20 Testing the students on topics of the 14 and 15th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 14-15th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 269-303.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Parts 9/ 10, P. 183-239.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. II ,Book 2, Part 2, P. 350-541.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Parts 10/ 12, P. 196-223 / 236-247.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Parts VII / IX, P. 110-134 / 174-187.

Kacnelson L.A., Tankovskiy V.E. Uveitis (clinics, treatment). Moscow, "4th branch of Voenizdat", 1998.

Krasnov M.L., Shulpina N.B. Therapeutic Ophthalmology. Moscow, "Meditsina", 1985, P. 314-322.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 9: Intraocular Inflammations and Uveitis. (Part 2, P. 95- 259).

Session plan for Day 16

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L14 (1): Lens development abnormalities. Congenital cataracts.
Lecturer – L. Barseghyan
Congenital subluxation and luxation of lens, spherophakia, microphakia, macrophakia, anterior and posterior lenticonus.
Congenital cataracts: anterior and posterior polar, zonular, spindle-shaped, star-like, mild cataracts.

10:45 - 11:00 Break

11:00 - 11:45 L14 (2): Acquired cataracts.
Classification of cataracts. Senile cataracts: cortical, nuclear, subcapsular. Stages of cataracts: immature, mature, hypermature (Morgagni's).

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Together with students examine a patient with cataract. Assign to each student a patient with cataract for examination. Ask the students to perform visometry, biomicroscopy, tonometry, ophthalmometry, ophthalmobiometry and prepare the patient for eye fundus examination.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Continue cataract patients' examination. Ask the students to examine eye fundus of patients, if needed perform eye Ultrasound and Electrophysiological examinations together with specialists.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss congenital and acquired cataracts. Ask a student to draw on the desk the biomicroscopic features of lens in norm. Ask another one to tell about changes in lens due to different cataracts.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to cataracts. The following topics will be suggested to the students:
1. Diabetic cataracts.
2. Congenital cataracts and their treatment.
Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 17

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L15 (1): Cataract surgery. Usage of ultrasound and laser in ophthalmology. Lecturer – L. Barseghyan
Intracapsular (ICCE) and extracapsular (ECCE) cataract extraction: indications, contraindications, technique, complications.

10:45 - 11:00 Break

11:00 - 11:45 L15 (2): Intraocular lens (IOL) insertion. Lecturer-L. Barseghyan
Types of IOL-anterior and posterior chamber, iris- supported lenses.
Lens insertion technique.

During the lecture show on the atlas different stages of cataract extraction.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Ask the students to prepare cataract patients for the surgery. Together with students perform premedications.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Accompany the students to the operating room for the participation in cataract surgery and lens insertion**.**

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss cataract treatment. Show the film about facoemulsification and after discuss the indications and contraindications for the facoemulsification.
(See Appendices 2, 3, 4).

Ask the students about the expediency of drug therapy in different stages of cataracts.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to cataract surgery. The following topics will be suggested to the students:
1. Cataract tunnel extraction.
2. Phacoemulsification.
3. Extraction of traumatic cataract.
4. Cataract extraction in patients with glaucoma.

Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 18

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 GW (1): Executors – L.Barseghyan, A.Gabrielyan, E.Ter-Andriasov
Discuss the IOL implantation: technique, indications, contraindications and complications.

10:45 - 11:00 Break

11:00 – 13:00 PT (1): Accompany the students to the operating room for the participation in cataract surgery. Allow the students to take part/assist in cataract surgery.

13:00 - 13:30 Lunch

13:30 - 15:30 PT (2): Continue working at the operating room.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Answer the students' questions concerning cataract extraction and lens insertion.

Ask students' opinion about the methods and quality of cataract surgery in Armenia.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 19

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 GW (1): Executor – E.Ter-Andriasov
Together with the students observe operated a day before patients, evaluate the operated eye state, get acquainted with the list of prescriptions.
Discuss the postoperative treatment of patients' after the cataract extraction.

10:45 - 11:00 Break

11:00 – 13:00 PT (1): Accompany the students to the operating room for the participation and assistance in cataract surgery.

13:00 - 13:30 Lunch

13:30 - 15:30 PT (2): Continue working at the operating room.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Ask the students to tell about the complications of cataract surgery and their prevention.

16:10- 16:20 Testing the students on topics of the 16, 17, 18 and 19th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 16 -19th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 245-269.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 8, P. 167-183.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. II, Book 2, Part 1, P. 305-350.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 11, P. 223-236.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part VIII , P. 134-169.

Danilichev V.F. Contemporary Ophthalmology. Manual For the Physicians. S.-Petersburg, "Piter", 2000, Parts 9 / 14, P. 300-340 / 497-531.

Fedorov S.N., Egorova E.V. Artificial Lens Implantation Mistakes and Complications. MNTK, "Eye Microsurgery", 1992.

Gorbani A.I., Djaliashvili I.A. Eye Microsurgery: Mistakes and Complications. Saint – Petersburg, "Hippocrates", 1993, Parts 2 / 7, P. 60-86 / 218-270.
Kratz Richard P., Shammas John H. Cataracts. Color atlas of ophthalmic surgery. 1991.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 11: Lens and Cataract.

Session plan for Day 20

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L16 (1): General retinal pathologies. Lecturer – S. Bakhshinova
Vascular diseases: acute impassability (obstruction) of central retinal artery (CRA), vein (CRV) and their branches: aetiology, diagnostics, clinics, treatment.

10:45 - 11:00 Break

11:00 - 11:45 L16 (2): Retinal inflammations (retinitis and maculitis).
Retinitis in case of rheumatism, tuberculosis, syphilis, toxoplasmosis.
Maculitis: aetiology, clinics, treatment, outcomes.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Ask the students to perform direct and indirect ophthalmoscopy, examine retinal entopic phenomena (Hajdinger's phenomenon, mechanophosphen and etc.).

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Assign patients with retinal pathologies and ask the students to examine them, suggest the treatment and perform treating procedures.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics:
Acute impassability (obstruction) of central retinal artery (CRA), vein (CRV) and their branches: urgent aid, treatment.

Ask the students to tell the main reasons of CRA and CRV obstructions, peculiarities of clinic and the outcomes.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Discuss the lecture material on the following topics:
Retinitis due to toxoplasmosis. Ask a student to tell the diff. diagnostics between syphilitic and tuberculous retinitis.

Question for discussion: Characteristic features of "fresh" and "old" retinal lesions.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 21

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L17 (1): Retinal dystrophies. Retinopathies. Lecturer – S. Bakhshinova
Classification. Congenital, primary, secondary retinal dystrophies.
Maculodystrophies.
Hypertensive and diabetic angioretinopathies: aetiology, classification.

10:45 - 11:00 Break

11:00 - 11:45 L17 (2): Retinal detachment. Lecturer-E.Ter-Andriasov
Classification, diagnostics, clinics and treatment of retinal detachments. Laser treatment of retinal detachments.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany the students to therapeutic and endocrinological departments for the examination of patients. Ask the students to examine patients and to write down the revealed ocular disorders.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Ask the students to take ophthalmic and medical history from patients with retinal detachments and to examine the patients.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics:
Hypertensive angioretinopathy: aetiology, classification, clinics, treatment.
Diabetic angioretinopathy: aetiology, classification, clinics, treatment.
Indications and contraindications for laser treatment.

Questions for discussion: Which are the stages of macula changes in myopic disease?
Ask a student to enumerate the antisclerotic drugs used in ophthalmology.
Ask one of the students to tell the characteristic changes of retina in pigment degeneration.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Presentation and discussion.
Presentation related to retinal pathologies. The following topics will be suggested to the students:
1. Diabetic retinopathy.
2. Retinal detachment: diagnostics and clinics.
3. Retinal detachment: surgery.
Presentation will be followed by the feedback from the group and facilitator.

16:10- 16:20 Testing the students on topics of the 20 and 21st days.

16:20 – 16:30 Discussion and summarizing the study material.

Literature for 20 - 21st days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 303-337.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 11, P. 239-261.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. III ,Book 1, Part 1, P. 11- 91.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 13, P. 247-283.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part X, P. 189-212.

Krasnov M.L., Shulpina N.B. Therapeutic Ophthalmology. Moscow, "Meditsina", 1985, P. 58-301 / 427-548.

Tankovskij V.E. Retinal Vessels Thrombosis. Moscow, "4th branch of Voenizdat", 2000.

Antelava D.I., Pivovarov N.N., Saphoyan A.A. Primary Retinal Detachment (pathogenesis, diagnostics, treatment).Tbilisi, "Sabchata Sakhartvelo", 1986.

Kacnelson L.A. Clinical Atlas of Fundus Pathology. Moscow, "GEOTAR Meditsina", 1999.

Vodovozov A.M. Retinal Detachment, Macular Hole, PVRP as Complications of Involutional Vitreoretinal Syndrome. Volgograd : Committee of Press and Information, 1998.

Kalinin A.P., Mojerenkov V.P., Prokofeva G.L. Ophthalmoendocrinology. Moscow, "Meditsina", 1999.

Paton David, Hyman Barry N., Justice, Jr. Jonny. Introduction to ophthalmoscopy. 1985.

Session plan for Day 22

9:30 – 9:45 Participation in the morning round.

9:49 – 10:00 Introduction. Lecturer – A. Hovhanessyan

10:00 – 10:45 L18 (1): Inflammations and vascular diseases of the optic nerve.
Lecturer - A. Hovhanessyan
Classification of the optic nerve inflammatory diseases. Intrabulbar and retrobulbar neuritis. Anterior and posterior ischemic neuropathies: aetiology, diagnostics, clinics and treatment.

10:45 – 11:00 Break

11:00 – 11:45 L18 (2): Papilloedema. Optic disc atrophies.
Papilloedema: different theories of aetiology. Primary and secondary atrophies of the optic nerve.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Together with students examine patients with visual pathways disorders.
Ask students to perform ophthalmoscopy, perimetry and ectrophysiological examinations if needed. Explain to the students the technique of the optic nerve revascularization and vasoreconstructive operations.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Accompany the students to the neurological department for the examination of patients. Ask them to write down the results of their examination for the discussion during the group work.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material on the following topics:
Intrabulbar (papillitis) and retrobulbar neuritis, vascular diseases of the optic nerve, papilloedema, primary and secondary atrophies of the optic nerve.

Discuss the results of neurological department patients' examination. Ask the students to suggest treatment and to confirm a diagnosis of eye disorders revealed in these patients.

Questions for discussion:
How the rapid development of the optic nerve oedema can be explained?
Differential diagnostics between optic nerve oedema, papillitis and ischemia.
What is Foster-Kennedy's syndrome?

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Presentation and discussion.

Presentation related to optic neuritis. The following topic will be suggested to the students:

1. Retrobulbar neuritis.

Presentation will be followed by the feedback from the group and facilitator.

16:10 -16:20 Testing the students on topics of the 22nd day.

16:20 – 16:30 Discussion and summarizing the study material.

Ask students to present in written their comments regarding the training day.

Literature for 22nd day of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 337-352.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 12, P. 286-333.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. III , Book 1, Part 2, P. 91- 228.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 14, P. 286-332.

Sjomina A. Retrobulbar Neuritis Syndrome. Moscow, "Irdash", 1994 .

Gustov A.B., Sigrianskij K.I., Stoljarova J.P. Practical Neuroophthalmology. Nijnij Novgorod, Publ. NGMA 2000.

Krasnov M.L., Shulpina N.B. Therapeutic Ophthalmology. Moscow, "Meditsina", 1985, P. 367-427.

Session plan for Day 23

9:30 – 9:45 Participation in the morning round.

9:45 – 10:45 L19 (1): Glaucoma classification. Lecturer – A.Hovhanessyan
Present to students different classifications of glaucoma.

10:45 – 11:00 Break

11:00 – 11:45 L19 (2): Anterior chamber angle gonioscopy.
Lecturer – A. Hovhanessyan
Anterior chamber angle (AChA): anatomy, gonioscopy in norm. Gonioscopic changes of the AChA due to different types of glaucoma.

11:45 – 12:00 Break

12:00 – 13:00 PT (1): Together with the students prepare a glaucoma patient for gonioscopy. Explain and demonstrate the technique of gonioscopic examination.

13:00 – 13:30 Lunch

13:30 – 14:30 PT (2): Assign glaucoma patients to students and ask them to prepare patients for gonioscopy. Allow the students to perform gonioscopy. Evaluate how they do it and make remarks if needed.

14:30 – 14:45 Break

14:45 – 15:30 GW (1): Discuss the lecture material.
Ask the students to draw on papers the gonioscopic zones of AChA. Ask one student to do it on the desk. Ask another student to tell about gonioscopic changes of AChA due to glaucoma.

15:30 – 15:45 Break

15:45 – 16:20 GW (2): Discuss the lecture material.
Demonstrate the atlas of gonioscopy and ask the students to describe the AchA and define the type of glaucoma according to gonioscopic changes of AChA.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 24

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L20 (1): Eye hydrodynamics and hydrostatics. Lecturer – A. Hovhanessyan
Intraocular fluid (IOF): composition, production and circulation. Outflow structures. Poiseuille's law. Gonioscopic features of the anterior chamber angle (AChA). Hydrostatics of the anterior segment, drainage system, eye diaphragm, vitreous body and the optic disc. Hydrostatic buffer effect. Hydrostatics of the glaucomic eye.

10:45 - 11:00 Break

11:00 - 11:45 L20 (2): Glaucoma diagnostics.
Glaucoma early diagnostics. Changes of the optic nerve, visual field and eye hydrodynamics due to glaucoma.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany the students to the dressing room for glaucoma patients examination. Tell the students to perform tonometry, tonography. Ask them to write down and keep the data of performed examinations for further discussion during the group work.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Assign to students glaucoma patients for performing perimetry and eye fundus examination. Ask the students to determine type and size of the optic excavation *(check the answers).*

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material.
Ask the students to tell about the eye hydrostatics and hydrodynamics using plaster casts and schemes. Ask a student to draw on the desk a table containing different types of blocks.

Discuss the results of performed during the practical training tonometry and tonography (See PT 1).

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to glaucoma. The following topic will be suggested to the students:
1. Glaucoma early diagnostics.
Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 25

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L21 (1): Secondary glaucoma. Lecturer – A. Sharambekyan
Postinflammatory, phakogenic, uveal, traumatic, postoperative, neoplastic glaucomas.

10:45 - 11:00 Break

11:00 - 11:45 L21 (2): Glaucoma conservative treatment. Lecturer – A.Hovhannesyan
Estimation and selection of glaucoma treatment different methods. Main drug groups, used in glaucoma treatment.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany the students to the operating room for the participation in secondary glaucoma surgery.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Continue the work in the operating room. Allow students to assist in glaucoma surgery. If there are no operations together with students examine glaucoma patients, ask them to present the medical history of the patients they have examined before and discuss treatment.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics:
Acute attack of angle-closure glaucoma: diagnostics, clinics, treatment, urgent aid.
Together with students discuss main drug groups used in glaucoma treatment.

Ask a student to draw on the desk the table showing the diff. diagnostics between acute attack of angle-closure glaucoma and acute iridocyclitis.
Ask the students to tell about uveopathies and their diff. diagnostics with glaucoma.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to glaucoma. The following topics will be suggested to the students:
1. Combination of different medications in glaucoma treatment.
2. Secondary glaucoma treatment.
3. Normotensive glaucoma (See Appendix 5).
Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 26

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L 22 (1): Glaucoma surgery. Lecturer – A. Hovhanessyan
Classification of glaucoma operations. Operations, recovering the IOL circulation, and etc.
Surgery of malignant glaucoma.

10:45 - 11:00 Break

11:00 - 11:45 L 22 (2): Glaucoma laser treatment.
Types of lasers used in glaucoma surgery. Indications for glaucoma laser treatment.

11:45 - 12:00 Break

12:00 - 14:00 PT (1): Accompany the students to the operating room for the participation in glaucoma surgery.

14:00 - 14:30 Lunch

14:30 -15:30 GW (1): Discuss the indications and contraindications for glaucoma surgery. Ask the students what types of glaucoma operations do they know.

15:30 - 15:45 Break

15:45 – 16:10 GW (2): Discuss the filtering operations. Ask students to tell about surgery efficiency estimation according to conjunctival pillow size and shape.

16:10- 16:20 Testing the students on topics of the 23, 24, 25 and 26th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 23 – 26 th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 352-387.

Nesterov A.P. Glaucoma. Moscow, "Meditsina", 1995.

Shulpina N.B. Eye Biomicroscopy. Moscow, "Meditsina", 1974, Part XI, P. 215-244.

Bojningen Van E. Atlas of Goniobiomicroscopy. Moscow, "Meditsina", 1965.

Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Parts 15 / 18, P. 402-460.

Arkhangelskiy V.N. Eye Diseases Manual, Moscow, MEDGIZ, 1962, Vol. II, Book 2, Part 3, P. 541-711.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 15, P. 332-373.

Danilichev V.F. Contemporary Ophthalmology. Manual For the Physicians. S.-Petersburg, "Piter", 2000 , Part 12, P. 436-460.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 10: Glaucoma. (P. 5 -172).

Session plan for Day 27

9:30 - 9:45 Participation in the morning round.

9:45 – 10:00 Introduction. Lecturer – A.Avetisyan

10:00 - 10:45 L23 (1): Visual organ injuries.
Present data concerning the eye traumas.

10:45 - 11:00 Break

11:00 - 11:45 L23 (2): Eye injuries classification.
Poliak's classification. Eye penetrating and non- penetrating wounds. Penetrating wounds with intraocular foreign body (IOFB) insertion.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany the students to X-ray room for getting acquainted with the X-ray diagnostic methods of eye traumas. Demonstrate Comberg- Baltin's prosthesis and Poliak's measuring tables.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Continue working in X-ray room. Assign a patient with eye trauma for the X-ray examination. Tell the students about the patients' position during the eye X-ray examination. Show on the patient the application of Comberg - Baltin's prosthesis. Demonstrate Poliak's measuring tables and explain how to use them.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Ask the students to tell the classification of eye injuries.
Ask each student to tell one absolute or relative sign of eye penetrating wound and write down them on the desk. Ask about methods of IOFB location determination and indications for IOFB removal.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to eye injuries. The following topics will be suggested to the students:
1. IOFB: diagnostics.
2. IOFB: indications and contraindications for removal.
3. Identification of IOFB location.

Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 28

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L24 (1): Eye penetrating wounds complications. Lecturer – A.Avetisyan
Endophthalmitis, panophthalmitis: diagnostics, clinics, treatment, prevention. Sympathetic ophthalmitis: aetiology, diagnostics, diff. diagnostics, clinics, treatment and prevention.

10:45 - 11:00 Break

11:00 - 11:45 L24 (2): Primary microsurgical processing (PMSP).
Lecturer – A.Avetisyan
Common principles of PMSP. PMSP of the eye and its accessory apparatus wounds. Stages of providing medical care in eye injuries. Surgical sutures used in eye PMSP (synthetic, biological, absorbing, non - absorbing). Rules of stitching the eye wounds.

11:45 - 12:00 Break

12:00 - 14:00 PT (1, 2): If there are patients with eye injuries perform PMSP of the eye wound and ask the students to assist. If there are no patients with eye injuries accompany the students to the operating room and allow them to perform PMSP on the enucleated eyes of animals.

14:00 - 14:30 Lunch

14:30 - 15:30 GW (1): Discuss the results of PT (1, 2). Estimate surgical skills of students (stitching the eye tissues and removing the sutures), point out the students mistakes and give advices for the improvement of provided surgical help.

Ask the students to enumerate advantages and disadvantages of continuous and interrupted sutures.

15:30 - 15:45 Break

15:45 - 16:20 GW (2): Presentation and discussion.
Presentation related to eye injuries complications. The following topic will be suggested to the students:
1. Sympathetic ophthalmitis.
Presentation will be followed by the feedback from the group and facilitator.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Session plan for Day 29

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L25 (1): Eye contusions. Lecturer – A.Avetisyan
Mechanisms of the eye contusions development. Classification of eye contusions (after G.A. Petropavlovskaya).

10:45 - 11:00 Break

11:00 - 11:45 L25 (2): Eye burns. Lecturer – E.Ter-Andriasov
Classification of eye burns. Chemical, thermic, thermochemical burns. Stages of the burn process development. Common principles of the eye burns treatment. Urgent and first aid.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): If there are patients with eye contusions examine them together with students. Ask the students to offer treatment and to explain their prescriptions. If there are no patients with eye contusions accompany the students to the operating room for the assistance in surgery.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): See PT 1.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Ask the students about the development mechanisms of eye contusions. Show on the atlas eye contusions. Discuss treatment of eye burns. Ask a student to classify the eye burns. Discuss the eye alkali and acid burns, their peculiarities.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Presentation and discussion.
Presentation related to eye contusions. The following topics will be suggested to the students:
1. Retinal detachment in case of eye contusion.
2. Treatment of hemophthalmitis.
Presentation will be followed by the feedback from the group and facilitator.

16:10- 16:20 Testing the students on topics of the 27, 28 and 29th days.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 27 - 29th days of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 478-509.

Gundorova R.A., Malaev A.A., Ujakov A.I. Eye Injuries. Moscow, "Meditsina", 1986.
Morozov V.I., Jakovlev A.A. Drug Therapy of Ocular Diseases. Moscow, "Meditsina", 2001, Part 6, P. 147-159.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 19, P. 403-413.

Danilichev V.F. Contemporary Ophthalmology. Manual For the Physicians. S.-Petersburg, "Piter", 2000.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 8, Part 9, P. 357- 396.

Session plan for Day 30

9:30 - 9:45 Participation in the morning round.

9:45 - 10:45 L26 (1): Binocular vision and its disturbances. Lecturer – L.Barseghyan
Corresponding and non-corresponding points of the retina. Horopter's circle, Panum's zone. Physiological diplopia.

10:45 - 11:00 Break

11:00 - 11:45 L26 (2): Squint.
Convergent and paralytic squint. Types of squint: apparent, latent, manifestated.

11:45 - 12:00 Break

12:00 - 13:00 PT (1): Accompany the students to the orthoptic room. Assign to students patients with squint, ask the students to examine them and to confirm a diagnosis.

13:00 - 13:30 Lunch

13:30 - 14:30 PT (2): Continue working in orthoptic room.

14:30 - 14:45 Break

14:45 - 15:30 GW (1): Discuss the lecture material on the following topics:
Latent, manifestated and apparent squint. Squint management and treatment.

Questions for discussion:
Which are the necessary conditions for binocular vision?
Tell the volume of eye fusal reserves.
Diff. diagnostics between manifestated and latent squint.
Diff. diagnostics between convergent and paralytic squint.

15:30 - 15:45 Break

15:45 - 16:10 GW (2): Presentation and discussion.
Presentation related to squint. The following topics will be suggested to the students:
1. Squint surgery.
2. Differential diagnostics between convergent and paralytic squint.
Presentation will be followed by the feedback from the group and facilitator.

16:10- 16:20 Testing the students on topics of the 30th day.

16:20 – 16:30 Discussion and summarizing the study material.
Ask students to present in written their comments regarding the training day.

Literature for 30th day of the course:

Kopaeva V.G. Eye Diseases. Moscow, "Meditsina", 2002, P. 387-411.

Rozenblum U.Z. Optometry. Saint – Petersburg, "Hippocrates", 1996.

Avetisov E.C. Convergent Squint. Moscow, "Meditsina", 1977.

Doljich G.I. Eye Diseases in Questions and Answers. Rostov-na-Donu, "Phoenix", 2000, Part 16, P. 373-383.

Gorbani A.I, Djaliashvili I.A. Eye Microsurgery: Mistakes and Complications. Saint – Petersburg, "Hippocrates", 1993, Part 4, P. 104-132.

Basic and Clinical Science Course. Fundamentals and Principles of Ophthalmology. American Academy of Ophthalmology, 2003-2004, Section 6.

Session plan for Day 31

Individual Study- Preparation for the examination.

Session plan for Day 32

10:00 -13:00 Examination on practical skills

At least 3 patients from the 8th eye clinic with different eye pathologies are assigned to each of the students. Students should independently examine patients and fill out a medical record form, that includes results of the objective examination, justification of the diagnosis and recommended treatment of revealed pathologies. The patients will be selected by the course organizers.

13:00 - 13:30 Break

14:00 - 17:00 Oral examination on theory.

The examination questions should be distributed to the students at least 5 days before the examination to allow for preparation time. The total number of questions is 100. During the exam each student will be given 5 questions only. Time for preparation is 30 minutes.

List of topics for the presentations

1. Myopia surgery.
2. Myopia and pregnancy.
3. Contemporary methods of refractive errors correction.
4. Electrophysiological examinations in eye diseases diagnostics.
5. Ultrasound examination in ophthalmology.
6. Herpetic keratitis.
7. Differential diagnostics between keratitis of different aetiology.
8. Types and technique of keratoplasty.
9. Keratoconus: early diagnostics and treatment.
10. Diabetic cataracts.
11. Congenital cataracts and their treatment.
12. Cataract tunnel extraction.
13. Phacoemulsification.
14. Extraction of traumatic cataract.
15. Cataract extraction in patients with glaucoma.
16. Diabetic retinopathy.
17. Retinal detachment: diagnostics and clinics.
18. Retinal detachment: surgery.
19. Retrobulbar neuritis.
20. Methods of early diagnostics of glaucoma.
21. Combination of different medications in glaucoma treatment.
22. Secondary glaucoma treatment.
23. Normotensive glaucoma.
24. IOFB: diagnostics.
25. IOFB: indications and contraindications for removal.
26. Identification of IOFB location.
27. Sympathetic ophthalmitis.
28. Retinal detachment in case of eye contusion.
29. Treatment of hemophthalmitis.
30. Squint surgery.
31. Differential diagnostics between convergent and paralytic squint.

APPENDIX V.

Necessary Skills for Ophthalmologists

By the end of the course the student should:

1. perform visometry
2. perform perimetry
3. know how to perform campimetry
4. know how to perform adaptometry
5. examine color vision (Rabkin's plates)
6. examine binocular vision
7. examine macula functions (maculotester, Amsler grid test, entopic phenomena)
8. perform exophthalmometry
9. reveal eye refractive errors
10. correct different refractive errors
11. work with lensmeter
12. perform sciascopy (retinoscopy) with narrow and wide pupils
13. perform ophthalmometry
14. examine eye accommodation and convergence
15. determine negative part of eye relative accommodation (reserves of accommodation)
16. know accommodation palsy diagnostic tests
17. examine fusion and convergence reserves
18. accomplish biomicroscopy, biomicroophthalmoscopy, gonioscopy
19. perform ophthalmoscopy (direct, indirect), diaphanoscopy
20. perform lacrimal sac evacuation
21. perform lacrimal sac massage
22. perform diagnostic fluorescein tests to reveal lacrimal ducts pathology
23. perform washing and probing of lacrimal ducts
24. test corneal reflex (sensitivity)
25. perform Zejdel's test
26. remove foreign bodies from cornea and conjunctiva
27. perform corneal diathermocoagulation
28. perform drug insertion different methods: subconjunctival, parabulbar, retrobulbar
29. apply aseptic bandages on eyes
30. perform premedications and preoperative anesthesia
31. assist in eye surgery
32. know the technique of stitching and removing surgical sutures
33. perform tonometry, tonography
34. know the alcoholization technique in absolute glaucoma
35. provide first aid in urgent situations in ophthalmology
36. be familiar with intraocular foreign body location determination
37. be familiar with performing primary surgical processing

APPENDIX VI.

PUBLIC HEALTH OPHTHALMOLOGY COURSE

I. Course Context

Description of Students
The course is designed for ophthalmologists in training, practicing ophthalmologists, optometrists and ophthalmic nurses with a career interest in public health programs in eye care. A class of 6-10 participants is anticipated, approximately half being practitioners and the other half being ophthalmologists in training.

Social Setting
- The course is developed for use by persons practicing or intending to practice in Armenia.
- In total, there are 291 ophthalmologists in Armenia, of which 82% (n=238) work in Yerevan, and 18% (n=53) in the rural areas.[3]
- The country is divided into 10 administrative provinces (marzes) and the capital, Yerevan, where roughly one-third of the population resides. Each province is divided into 2-3 regions so that on average each region is served by approximately 2 ophthalmologists.

Educational Setting
- Practitioners will be sent by their health district and participation in this course will constitute part of their Continuing Professional Development requirement.
- Students will enroll to prepare them to develop eye programs in their district or to work in existing eye programs.
- Completion of the course will lead to the awarding of a certificate.

Rationale

The causes of blindness are embedded in each community and a public health perspective is required to measure the extent of blinding diseases, to characterize the unique risk factors that each disease poses and to develop effective and practical approaches to prevention and treatment.

Unlike courses currently available in other settings[4,5,6], this course is very short and intensive but incorporates aspects of epidemiological research as well as practical application and program design. It is uniquely geared toward countries in transition, rather than developed or developing countries. It will be tailored to the needs of eye care professionals in Armenia as it is very affordable, conducted in their native language, and is the only program of its kind offered in former Soviet countries. Because it is short it can be run regularly, impacting the entire ophthalmic community rather than a few specialists. Finally, it is open to all eye care professionals rather than being limited to ophthalmologists and optometrists. Please see Appendix 1 for outlines of other courses in this field.

[3] MOH RA, 1998
[4] Public Health Ophthalmology Fellowship Program of Dana Center for Preventive Ophthalmology of the Johns Hopkins University: http://www.wilmer.jhu.edu/training/DANA.HTM
[5] Community Eye Health Msc at London School of Hygiene and Tropical Medicine (LSHTM): http://www.lshtm.ac.uk/prospectus/masters/msceh.html
[6] Planning for Vision 2020 at LSHTM: http://www.lshtm.ac.uk/prospectus/short/spv.html

II. Learning Needs of Students

The students are expected to have prior experience with:
- Clinical knowledge of the main blinding diseases and their treatment
- Principles of prevention of the main blinding diseases (including early diagnosis and screening)
- Basics of hygiene, epidemiology and public health

Students are not expected to know:
- How to manage an eye care program
- How to perform a needs assessment
- Grant-writing techniques

III. Aims and Learning Outcomes

- Aim: the primary objective of this course is to equip students to develop a community eye care program.
- In order to achieve the Aim of the course the following Learning Outcomes have been chosen. By the end of the course, students should be able to:
    (i) Describe the basic epidemiology of the major blinding eye diseases
    (ii) Distinguish between the various types of studies designed to assess community eye health needs
    (iii) Interpret the results of eye surveys
    (iv) Understand the basic issues surrounding resource mobilization, management and evaluation of local comprehensive eye care programs
    (v) Conduct a Community Eye Care Needs Assessment
    (vi) Critically appraise and select appropriate control strategies for the major blinding eye diseases
    (vii) Collaborate with other students to produce an eye care program
    (viii) Communicate a program design through presentation

IV. Description of the Course

- This course is designed as a mixed-type course incorporating aspects of discipline-based, experiential, competency based and problem solving course designs.
    (i) The portions of the course designed to meet the first three learning outcomes are primarily discipline based covering the major issues in Public Health Ophthalmology.
    (ii) Experiential methods such as a fieldwork day and interviews followed by time for reflection and discussion are used to help the students meet the learning outcome of conducting a community eye care needs assessment.
    (iii) A competency-based approach is taken in the writing up of the eye care needs assessment.
    (iv) A problem solving approach is taken to help students achieve the fifth learning outcome as students work together to design a community eye care program to meet the needs described in their needs assessment.
- The course does not incorporate problem based methods as the students are unlikely to have had prior exposure to this learning method and in an intensive course it was felt they would not have enough time to become adept at problem based learning.

- Throughout the course a variety of teaching methods are employed including:
  (i) Lectures, usually not more than 40 minutes long, which incorporate buzz groups and exercises built into the presentation.
  (ii) Group work (buzz groups, syndicates, problem-solving groups, brainstorming, open discussions, and rounds).
  (iii)Experiential learning methods such as interviews and project work, enhanced by time for self-reflection and evaluation. Reflection is also incorporated into the other aspects of the course.

V. Conceptual Outline/Timetable

The first five days of the course are spent covering the theoretical background to community eye health, orienting students to a public health understanding of the major blinding diseases and their epidemiology, and equipping them to do a needs assessment (fieldwork) (learning outcomes (i), (ii), (iii) and (vi)). The theory will be taught using a discipline-based approach. Issues surrounding each disease are different and this form of presentation should help students integrate the new perspective with their present clinical knowledge. Opportunities for students to contribute and learn from their experience will also be available. The topics covered in days 1-4 will be the subject of a multiple choice test on day 5. The needs assessment fieldwork and subsequent program design provide an opportunity for students to develop their group work skills (learning outcome (vii)). Because of time constraints, the fieldwork day will be facilitated by the course organizer who will liaise with the local health authorities in advance to make the visits as productive as possible for students conducting their needs assessment (learning outcome (v)).

The fieldwork (Day 8) is incorporated into the course itself to allow time for training (epidemiology and interview skills) before gathering information. In addition it allows for group work and avoids the pitfalls of sending students back to their own districts or requiring them to bring data with them. The facilitator will have prepared data in case any group fails to collect the necessary data during fieldwork.

Week one provides a solid platform of knowledge and skills which, together with data from the needs assessment, will be applied to aspects of program design during the second week of the course (primary aim). Day 10 introduces several topics which fall outside the main scope of the course (developing an action plan) but must be considered in the construction of that plan (learning outcome (iv)). The aim is to stimulate students to further reading or aid them in collaboration with others more experienced in program design. During the second week there will be several opportunities for students to get feedback from one another on individual elements of their program design as these are covered in class. There will be more structured feedback given after the presentations on the final day (learning outcome (viii)).

Assessment will be by group written report (50%), multiple choice questionnaire (30%), participation (10%) and presentation (10%). For details see Appendix 2.

Each ‘teaching’ day will consist of four sessions, two-morning and two-afternoon, each lasting 1-2 hours. A proposed seating plan is given in Appendix 3. Because the course is more than 30 hours of contact time, details of teaching on days 2, 3 and 4 are shown in Appendix 4.

Day 1 – Introduction and Epidemiology

Day 2-4—Epidemiology, control and public health aspects of main blinding diseases – see Appendix 2.

Day 5 – Introduction to Program Design

- Session 1: Assessment
  - 30 Minute Multiple Choice Exam on the topics covered thus far through the course
  - Exam to be marked by peers
- Session 2: Introduction to Needs Assessment
  - Estimating Prevalence of main blinding diseases
  - Estimating Treatment Coverage
  - Assessing Gap between Disease and Treatment
  - Introduction to Barriers to service
  - Community Involvement
- Session 3: Costs and Resources
  - Manpower, materials, mobility, management, money
  - Budget
  - Cost recovery mechanism
- Session 4: Planning
  - Define the aim
  - Specify the objectives
  - Define the priorities and strategy
  - Timetable

Day 6—Transferable Skills Day

- Session 1—Presentation Skills
- Session 2—Writing a proposal
- Sessions 3—Available to cover topics shown to be difficult during the MCQ assessment, or topics that students express an interest in which have not been timetabled
- Session 4—Preparation for Fieldwork
- Evening Activity—Depending on interests of the students, an evening out together in Yerevan

Day 7—Day of Rest

Day 8 – Fieldwork

- In small, mixed-experience groups students will visit the region for which they will design an eye care program
- They will visit the Regional Health Authority to obtain
  - Population of Region
  - Number of Practicing Ophthalmologists in the region
  - Number of Surgeries performed per/year
  - Information on what programs are currently in place
- They will contact all practicing ophthalmologists in the region (probably 2-3 depending on region) and interview them regarding
  - Needs of community

    - Barriers to service
- Time and logistics providing the team will conduct interviews with patients regarding
    - Barriers to service
    - Impact of blindness

Day 9 – Reflection and Analysis of Fieldwork; Problems, Resources and Strategies

- Session 1: Reflect on Fieldwork
- Session 2: Analyse Data from fieldwork
    - Estimation Techniques
    - Treatment coverage, prevalence and gaps
- Sessions 3 and 4: Problems, Resources and Strategies
    - Barriers to service
    - Available Resources
    - Involvement of the Community

Day 10 – Practical Aspects of Program Design

- Session 1: Planning
- Session 2: Budgeting
- Session 3: Management
- Session 4: Evaluation of Eye Care Programs

Day 11 – Preparation Day

- Private/Small Group Study
    - Create an action plan for a community eye health program
    - Prepare presentation

Day 12 – Presentations, Feedback and Conclusion

- Present Action Plan
- Discussion and Feedback
- Reflection on Course and Planning for applying skills in the future

VI. Session plan for Day 1

Rationale in italics

9:30-9:45 Icebreaker Rounds
Ask each participant to give their name, their background and what they expect from the course.

Help the students get to know each other for productive group learning.

9:45-10:05 Course Outline and Rationale Presented by Facilitator
Discuss the learning objectives for the course noting how they relate to the students' expectations discussed during the icebreaker rounds.
Talk through the timetable explaining that today is in part a review of the basic epidemiology introduced during medical training but will rapidly progress beyond this to an in-depth discussion of specific community eye health issues. Beginning on Day 5, the course will shift focus from the theory of community eye health to its practice and students will gain experience in each of the steps necessary to create a community eye health program from data collection through planning and budgeting to presentation.
Invite students to ask any questions they may have about the timetable, logistics of the course, objectives or other issues.

Help students see the relevance of each aspect of the course to their future practice.

10:05-10:20 Brainstorming on Eye Health Issues in Armenia
Ask the class to list the main eye health service problems in their communities and in the country. This can include quality of services, accessibility, supplies and materials, prices, low awareness. When the list is completed have them prioritize the top 3 problems.

Value student experience and help students transfer their existing knowledge of the situation in Armenia from their practice to give a new, community perspective on the problems.

10:20-10:40 Presentation on Vision 2020 – the Right to Sight
Begin by outlining the burden of blindness and low vision in the world as a whole, accompanied by a slide show to relate the condition to real people's lives across the world.
Describe Vision 2020 as the response of WHO and other NGOs collaborating on an initiative to tackle this problem of blindness and eliminate avoidable blindness (accounting for 80% of all blindness) by 2020.
Lay out the Vision 2020 approach: identifying communities with high levels of blindness, providing infrastructure and manpower to these communities and providing high quality affordable eye care services. Briefly cover the five major causes of preventable blindness targeted by the initiative: cataract, refractive error and low vision, onchocerciasis, childhood blindness – xerophthalmia and trachoma.
Explain the role of partnership with eye care professionals of all levels, national departments of health and NGOs, all of whom are to be represented within the International Agency for the Prevention of Blindness. Outline the broader role of Vision 2020 partners in raising awareness, controlling causes of blindness, training eye care personnel and building up infrastructure, as well as raising and channeling funds to where they are most needed[7,8].

[7] Vision 2020 The Right to Sight: http://www.v2020.org/main_page.asp

An audiovisual presentation will engage students with the vision needs of the wider world more effectively than written material alone and provides a shared experience leading to more natural discussion.

10:40-11:00 Class Discussion: Is Vision 2020 suitable for us?
Ask students which causes of blindness seen in Armenia are preventable. Are the priorities for eye health in Armenia the same as those of Vision 2020? Does the approach to tackling the problem outlined above cover the most important aspects of eye health in Armenia? Discuss together the advantages and disadvantages of eye health workers becoming partners in the Vision 2020 scheme and ask students to outline their potential future role in the partnership.

Discussion can involve the whole group as it is small (6-10 students). This exercise is best undertaken as a group so students can work together on the issues and stimulate each other to think creatively.

11:00-11:30 Coffee
Rest for the brain and another opportunity to help the group relate to one another in a relaxed atmosphere.

11:30-1:00 Basics of Epidemiology Lecture and Exercises
Start lecture with the definition of Epidemiology as the study of the distribution, determinants and control of disease in human populations[9]. Quickly remind students of the main definitions such as incidence and prevalence, exposure and risk factors. Briefly discuss epidemiological research methods, such as cross-sectional, case control, cohort and intervention studies, including clinical trials.
Ask students what is the purpose of learning the epidemiology of eye diseases. List on the blackboard all their answers. Provide them with your list, which includes such purposes as to promote the preservation of health eyes and normal vision, and to prevent blindness and low vision in individuals and populations[8].
Describe the main patterns of eye diseases in different populations. Introduce the main types of eye survey, including eye disease survey, blindness survey, and RACSS (Rapid Assessment of Cataract Surgical Services)[10]. Distinguish between different types of eye survey and determine when each is appropriate. Discuss basic principles and guidelines of eye surveys focusing on sampling issues and standardized screening procedures.

Interactive lecture format is more appropriate here and below than group work as background material can be quickly revised and the other material will be fairly new to students.

Divide students into groups of three people. Give each group an exercise, which should be solved in 10 minutes. Ask each group to present the results of the exercise. Compare the results.

[8] Bulletin of the World Health Organization. Vol 79(3), 2001
[9] Gordon, J. The epidemiology of eye diseases. 1st ed, Chapman&Holl, 1998
[10] World Health Organization. Estimating Cataract surgical services in National Programmes. Geneva, December 2001

Exercise[11]:
In a health region of 1,000,000 people-
The prevalence of blindness is 1%
Cataract is responsible for 50% of blindness
Glaucoma is responsible fro 10% of blindness
Childhood blindness is responsible for 2% of blindness
How many people are blind due to cataract?
How many children are blind?

The problem solving exercise is a direct application of the lecture material and will ensure active learning by participants. Groups of three allow all students to have some input into how the problem is tackled (in a larger group one or two may dominate and allow others to be passive) and provide opportunity for students to strengthen each other's understanding and get to know each other.

1:00-2:00 Lunch

2:00-2:10 Buzz Group—"What is Blindness?"
Divide the class into 3 groups, using crossovers to ensure that the groups are different from during the Basics of Epidemiology session. Ask them to generate definitions of blindness that they are familiar with, discuss the advantages and disadvantages of these definitions, and describe when each definition is applicable.

Remind students that there is uncertainty in how blindness is best defined is helpful preparation for the next lecture.

2:10-2:20 Report back to group
Ask each group to verbally summarize their discussion.
Presentation skills practice.

2:20-3:00 Lecture: Definitions of blindness and low vision. World Wide Prevalence of Blindness
Discus different categories of vision, such as visual impairment, low vision, severe vision impairment, legally blind, blind, totally blind. Compare US and WHO classifications with classification accepted in Armenia.
Prepare a list of different visual acuities[9]. Ask student to categorize visual acuity:

	VISION RIGHT EYE	VISION LEFT EYE	CATEGORY
1	6/18	2/60	
2	Perception of Light	1/60	
3	6/60	6/60	
4	No Perception of Light	3/60	
5	6/24	4/60	

This directly applies the classifications described and is a form of active learning.

Introduce WHO Global Bank data on blindness and low vision in different regions of the world. Compare with available data from Armenia. Discuss main causes of blindness worldwide. Ask the students, "What could be done to reduce blindness?" List all answers on

[11] Planning for Vision 2020 Workshop. Course materials, June 2003

the board. Compare the following approaches: a profit vs. service approach, the practice of ophthalmology vs. comprehensive eye care, an individual vs. community approach. Remind students of the following terminologies: primary, secondary and tertiary prevention. Apply this to eye care in Armenia.

3:00-3:30 Coffee Break

3:30-4:15 Invited Speaker Lecture
Head of school for blind children, or head of the Society for Blind People in Armenia or another person involved in social services for blind people will be invited to speak on the potential cost of blindness and the main implications for family, community and society.

A presentation involving human interest stories and experiences will help students step back from a clinical focus on eye disease and reflect on how these problems impact on people's lives. This learning will help students to consider the best approach to caring for eye health in the community and priority setting.

4:15-4:30 Discussion and Questions for Invited Speaker

4.30-5.00 Feedback and Conclusion:
4:30-4:35 Have each student write down a list of things they have learnt and their positive and negative experiences during the day.

4:35-4:45 Rounds - Ask each student to talk about one thing they learnt and one positive and negative thing.

4:45-4:55 Feedback on methods and structure of the day.
Feedback and reflection will encourage deep learning and help the facilitator adjust the course to students' needs.

4:55-5:00 Notes on what will be covered tomorrow and readings included in the folder.

VII. Application of learning theories to course design and lesson plan

Considerations: Who is Learning What

The course is for adult eye care professionals with varying degrees of experience in their field. The main objective is for them to be able to design a program of community eye care and public eye health by the end of this two-week course. In view of the context, participants and objectives, some theories of learning are more appropriate than others.

Developmental Theory

The developmental theory of learning as proposed by Perry in the context of undergraduates is not very relevant to a two-week professional development course.[12] The aim for students in this course is less to develop students' capacity to wrestle with complex issues and come to conclusions than it is to equip them for the specific task of designing and eye care program.

Malcolm Knowles has argued that adults go through developmental stages with regard to their social roles, rather than their mental maturation.[13] The students enrolling in this course will indeed be transitioning from an entirely clinical profession into a program design and management role. This will have implications for the students' readiness to learn and for the structure of the course and grouping of participants.

Cognitive/Intellectual Theory

The cognitive/intellectual theory of learning[14] suggested that as the learners in this instance have previously been taught their disciplines in a structured manner and this structure should be built upon wherever possible.[15] The aim is for students to integrate what has been learnt from their experience as eye care professionals and new knowledge and thinking from the course with what has been learnt previously during higher education and before.

Transmission of relevant knowledge is an important part of the course, but students will also be active in applying new knowledge through problem solving exercises and discussion. The aim is to facilitate deep learning so that new and old knowledge can be transferred to the individual situations in which students may be planning community eye health programs in future. This learning will also be achievement-oriented to some extent, as students will seek to apply what is learnt to contribute to a good program design.

Behavioral Theory

The behavioral theory of learning[16] has only limited applications to adults in such a setting who are likely to be self-motivated by their desire to use this knowledge for their future practice. Thinking about issues from a public health point of view, however, is to be encouraged throughout the course and this can be reinforced and encouraged through feedback from the facilitator during times of group discussion.

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[12] Perry, W. G. (1984) In The Modern American CollegeJossey-Bass Publishers, London.

13 Knowles, M. (1970) The Modern Practice of Adult Education: From Pedagogy to Andragogy, Cambridge Book Company, Cambridge.

14 See Slavin RE Meaningful learning: the cognitive perspective in: Educational Psychology: theory into practice. Prentice-Hall International, Inc. pages 162-166

15 Cox, R. (1996) Teaching, learning and assessment in higher education Anthropology in Action, 3, 17-24.

[16] See Slavin RE Behavioral theories of learning in: *Educational Psychology: theory into practice. Prentice-Hall International, Inc*. pages 109-118

Andragogy
Andragogy provides a useful set of guiding principles for how adults learn. It is important that learners feel accepted among the group and that their experience is valued. Learners need to understand the relevance of what is being studied. Hence on the first day, the elements of the course will be explained and students will also introduce themselves and outline their hopes for what they can get out of the course. There are several group discussions on the first day which will also build a friendly atmosphere in the group.

Knowles theorizes that adults are likely to be problem-centered rather than subject-centered.[17] Thus the course and assessment focus on the problem of designing a program rather than learning discipline of public health. This helps students perceive the course as directly relevant to their future practice.

Because of the range and volume of relevant experiences adults have, andragogy argues that experiential techniques should be emphasized. To this end the course has built in several opportunities for the students to "learn to learn" from experience. At the end of each day a period of reflection and self-evaluation of learning is proposed. As learners go out on fieldwork, they will be put in groups with a range of past experience to facilitate learning from one another.

Synthesis
Overall, the most valuable learning theories in thinking about our course are andragogy and the cognitivist approach. These have underpinned several approaches to course design including discipline-based, experiential learning, problem solving and task based courses. A mixture of these designs is proposed, as described in Section VII. The course overall is aimed equip students for a complex task, solving the problem of finding an appropriate program design for their situation. However, new knowledge and skills will be needed for this. Students are most familiar with discipline based teaching from their prior study and so much of the material building on past knowledge will be presented in its intellectual sequence during the first week. This ties in with the cognitivist theory that learning constructs new knowledge onto an organized prior knowledge base. However, to facilitate this deep learning, lectures will be interspersed with problem solving exercises and group discussions.

Incorporating aspects of experiential learning should increase students' motivation, value their experience and help them to integrate it with the more theoretical knowledge. All students are assumed to have been learning in their place of work by experience and the principles of andragogy suggest that this is a resource to be cherished and that adult students will not appreciate being patronized by having their experience and past knowledge ignored. Teaching methods that make use of this resource are also more engaging for students and will help them to apply what is learnt directly. Hence students' experience is requested for class discussion at several points in the course, and an outside speaker with experience in the social impact of blindness will be invited to present case studies of the experiences of blind people and their communities for the students to relate to.

Fieldwork is also planned, which will provide the students with a shared experience during the course on which they can report back. Reflection on past experience as well as experiences during the course will be a daily part of group learning.

[17] Knowles, M. (1970) *The Modern Practice of Adult Education: From Pedagogy to Andragogy,* Cambridge Book Company, Cambridge.

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Appendix 1: Other Courses Offered in Public Health Ophthalmology

Public Health Ophthalmology Program, Dana Center, Wilmer Eye Institute, Johns Hopkins University, USA

- The program is very research oriented, focusing on various epidemiological studies of ocular disease.
- Takes one year of a very extensive work- each student enrolls as a student in the Master of Public Health degree program of the Bloomberg School of Public Health, taking required courses and electives including PHO 1 and 2 courses.
- Offered only for graduate ophthalmologists and optometrists, no ophthalmologists in training are accepted- limits the audience
- Offered only every 3-4 years
- Very expensive - Tuition and expenses are expected to be approximately $55,000

MSc Community Eye Health, International Center for Eye Health, LSHTM

- Develop a community oriented approach to eye health and control of blindness,
- Applicable mainly to developing countries
- Expect their students to be involved in practical application of the knowledge, rather then pure research

- Offered for a wide range of professionals involved in eye care, including eye care program managers, ophthalmologists, optometrists, ophthalmic nurses
- Takes from one to two years to complete

Planning for Vision 2020 course, International Center for Eye Health, LSHTM

- One- week workshop to introduce the aims, objectives and strategies of the VISION 2020 program
- Teaches the planning principles involved in establishing community eye health programs for the control of avoidable blindness to population clusters of around 1 million in developing countries
- Does not provide introduction to eye disease epidemiology and main issues related to eye disease research

Appendix 2. Assessment for Public Health Ophthalmology Course

Individual Assessment

1. Participation- 10% of the grade (learning outcome vii)
Each student's contribution to the class and group work and participation in the fieldwork will be assessed, aiming to motivate students to be more active during the course.

2. Quiz- 30% of the grade (Learning outcomes i, ii, iii)
A multiple-choice questionnaire on Day 5 will test understanding of the lecture material and the exercises covered in group work. Students will be asked to grade each other in order to increase their learning of the subject. They will learn what went wrong with their answers and receive confirmation about some other questions[18]. The facilitator will provide additional feedback the next day, and discuss the gaps in students' knowledge.

3. Presentation- 10% of the grade.
Students will be asked to work in groups of 2-3 to develop an eye care program (outcomes vi, vii) for a province of Armenia and to present their eye care programs on the last day of the course. The presentations will be followed by question and answer sessions when students can receive peer and facilitator feedback[5]. Although the whole group will be preparing the presentation, each student of the group will be asked to present a component of it. Good presentation skills are needed to be able to "sell" a proposal (learning outcome vii) and students can also learn from each other's performances.

Group Assessment

Group write-up- 50% of the grade
A written outline of the group's eye care program proposal will be submitted. This will develop grant-writing skills, advance knowledge of needs assessment, resource mobilization, management and evaluation of eye care programs and increase students' ability to select appropriate control strategies for the major blinding eye diseases (learning outcome iv, v, vi). This paper could be of particular relevance for those already working or planning to work in district level eye care and could provide a good basis for a proposal to donor organization.

The written assignment should not exceed 2,500 words and will include the following components:

1. Introduction- Needs Assessment

Provide socio-demographic and geographic description of the region. Present infrastructure of eye care in the province- number of eye care units, number of ophthalmic surgeons, ophthalmologists, ophthalmic nurses, availability of optometric services. If available, present eye care services utilization data, such as total number of patients per year, number of surgeries per year, per unit, per surgeon, main types of surgeries performed. If available, provide statistical information on prevalence of eye diseases, blindness and low vision.

[18] Race P, Pros and Cons of fifteen assessment techniques in: *The Lecturer's Toolkit, Kogan Page Ltd, 2nd Edition 2001* pages 35-81

2. Rationale

Provide brief situation analysis- what are the main problems of eye care in this province? Explain which problem you are going to target in your eye care program. Present justification of your decision.

3. Overall Objective

Describe the overall broader objective, to which the project will contribute. Provide the key indicators related to the overall objective.

4. Specific Objectives

Identify the specific objectives, which the project shall achieve. Describe the quantitative or qualitative indicators showing whether and to what extent the project's specific objectives are achieved. Give specific targets, i.e., number of surgeries, personnel trained, etc.

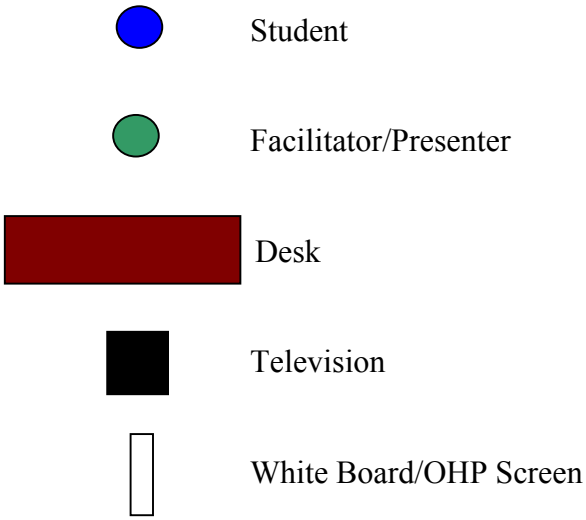
5. Implementation strategies

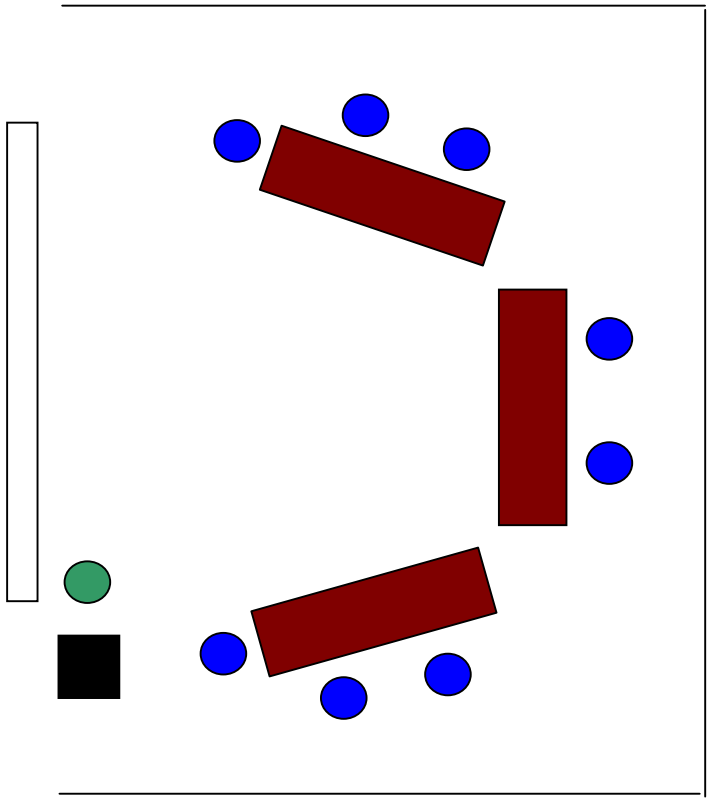
Develop the key activities to be carried out and describe in what sequence in order to produce the expected results. Give main strategy, infrastructure, training, plan of action. Include evaluation plan for project outcomes. List the means required to implement these activities, e. g. personnel, equipment, supplies, operational facilities, etc.

On a separate sheets attach the timetable and budget for project completion (not included in word count). Suggested format of budget and timetable will be distributed to the students.

6. References

Appendix 3. Seating Arrangement





Appendix 4: Timetable for days 2-4

Day 2 – Cataracts

- Session 1: Background
    - Definition of cataract blindness: lens opacity, operable cataract, cataract blindness
    - Magnitude of cataract blindness: prevalence, incidence
- Session 2: Barriers to cataract surgery:
    - lack of awareness-eye health education,
    - lack of expectations - quality of eye care
    - low financial and geographic accessibility of cataract services
- Session 3: Cataract surgery
    - Efficiency, volume and capacity
    - Cataract surgery rate
    - Cataract surgery coverage: Definition, measurement, rapid assessment
    - Cataract surgery outcome:
        - What factors determine the outcome of cataract surgery?
        - What should the cataract surgery outcome be?
        - How should the cataract surgery outcome be monitored?
        - What is the purpose of monitoring the outcome?
    - Cataract surgery cost:
        - Cost and price
        - Cost containment
        - Cost recovery model
        - Income generation and external subsidy
- Session 4: Improving cataract services:
    - Recommendations
    - Improving outcome
    - Improving output
    - Reducing costs

Day 3 – Glaucoma, Diabetic Retinopathy and Ocular Infections

- Session 1: Glaucoma
    - Definition and classifications
    - Magnitude, risk factors
    - Screening and case detection
    - Control-Treatment of chronic glaucoma
    - Community program to reduce blindness from glaucoma
- Session 2: Diabetic Retinopathy
    - Definition
    - Clinical features, natural history and management
    - Magnitude
    - Control
    - Community program to reduce blindness from diabetic retinopathy
- Session 3 and 4: Ocular Infections
    - HIV / AIDS,
    - Toxoplasmosis / uveitis,
    - Infective keratitis

Day 4 – Childhood Eye Diseases

- Session 1: Background
  - Definition: ROP, Refractive Errors
  - Magnitude- results of blind school studies
- Session 2: Causes
- Session 3: School eye health education
- Session 4: Control:
  - Why are children blind?
  - What causes are avoidable?
  - How can we prevent these diseases?

APPENDIX VII.

Jinishian Memorial Foundation's Contribution

Due to kind contribution of Jinishian Memorial Foundation[19], it became possible to organize a local training of ophthalmic personnel of Sevan ROU. Moreover, the ophthalmic personnel of Ijevan Policlinic (one ophthalmologist and one ophthalmic nurse), along with the specialists of Sevan ROU, also passed local trainings.

JMF covered the following trainings:

- Public Health Ophthalmology training of three ophthalmologists (two from Sevan ROU and one from Ijevan policlinic) and three ophthalmic nurses (two from Sevan ROU and one from Ijevan policlinic).
- Course on contemporary methods of eye disease diagnostics and treatment, organized at the Ophthalmology Chair of the National Institute of Health, for two ophthalmologists (one from Sevan ROU and one from Ijevan policlinic).
- Refresher course for ophthalmic nurses, organized at the Ophthalmology Chair of the National Institute of Health, for three ophthalmic nurses (two from Sevan ROU and one from Ijevan policlinic).

[19] JMF is a branch of the Jinishian Memorial Program, which was created through a bequest by Vartan Jinishian in 1966. JMP is administered by the Worldwide Ministries Division of the Presbyterian Church (U.S.A.).

APPENDIX VIII.

Student evaluation form

Date ___/___/2005

The course name _____

Student Evaluations of teaching and course content are carefully considered by the course organizers to improve the quality of programs. Your objective evaluation and constructive comments are sought for this purpose.

Contents of evaluation forms are released to the instructor, in an anonymous form, after course grades have been posted. For each of the items listed below, please circle the number that most closely reflects your opinion.

The course	**exc.**	**good**	**fair**	**poor**	**missing**
1. material is relevant to my professional needs	5	4	3	2	1
2. material is relevant to my expectations	5	4	3	2	1
3. how will you grade the practical trainings	5	4	3	2	1
4. how will you grade the professionalism of the instructors	5	4	3	2	1
5. overall, how will you assess the course	5	4	3	2	1

Suggestions/Remarks/Recommendations

_____
_____
_____
_____
_____
_____
_____

APPENDIX IX.

ESTABLISHMENT OF VILLAGE EXAMINATION CENTERS

Donated items

LIST OF MEDICATIONS AND SUPPLIES

1. Medical Alcohol 100ml (1)
2. Lidocain 2.0% (10)
3. Levomycetin 0.25% (4)
4. Gentamycin 0.3% (4)
5. Ciprofloxacin 0.3% (1)
6. Timoptik 0.25% (1)
7. Pilocarpin 1.0% (1)
8. KMnO4 5.0% (1)
9. Cotton 100gr. (1)

LIST OF EQUIPMENT

1. Hand loupe (1)
2. Flash-light (1)
3. Battery (2)
4. Visual Acuity Measurement Chart (3)
5. Eyeglasses (36 pairs)

LIST OF EDUCATIONAL MATERIALS AND OFFICE SUPPLIES

1. Pen (1)
2. Pencil (1)
3. Notepad (1)
4. Folder (1)
5. Brochure “Basics of Ophthalmology”
6. Training materials on global blindness and blindness prevention activities