



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

**Human resource development and capacity building for prevention of blindness in
Gegharkunik and Tavush marzes of Armenia**

Final Report to Jinishian Memorial Fund

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Dr. Kirakosyan participated in the preparatory activities 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 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 Primary Eye Care training for 20 village ambulatory nurses in Gegharkunik and Tavush marzes.

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Dr. Hakobyan took part in the preparatory activities of the project.

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- 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 Primary Eye Care training for 20 village ambulatory nurses in Gegharkunik and Tavush marzes.

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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

Armen Dallakyan, ophthalmologist, Ijevan polyclinic

Margarit Margaryan, ophthalmologist, Sevan ROU

The following ophthalmic nurses were trained:

Shogher Mirzoyan (Ijevan polyclinic)

Hripsik Kocharyan (Sevan ROU)

Narine Navasardyan (Sevan ROU)

The following 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 Mec 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)
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Executive Summary

The Garo Meghriyan Eye Institute for Preventive Ophthalmology (GMEIPO) of the Center for Health Services Research and Development (CHSR) at the American University of Armenia (AUA) implemented a 6 month project aimed at blindness prevention in the remote and underserved regions of Gegharkunik and Tavush marzes of Armenia. The project was focused on human resource development and capacity building in order to improve primary eye care and develop secondary/district level of eye care. The project consisted of two main components: training of the personnel and establishment of village examination centers in target marzes.

The training of ophthalmologists was organized at the Ophthalmology Chair of the National Institute of Health (NIH) of Republic of Armenia. Two ophthalmologists (one from Ijevan and the other from Sevan) passed a 7-week refresher course on ophthalmology. The course was carried out based on the specialization program developed jointly by the GMEIPO ophthalmic staff and the leading specialists of the Ophthalmology Chair of NIH. The training was providing 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 program, which was 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 successful completion of the training, 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 ophthalmologist 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.

During the project, 20 village examination centers were established: 10 in Gegharkunik and 10 in Tavush marz. The following criteria were used to select the villages: being far from regional health institutions, accessible roads, adequate population, having close neighboring villages with accessible roads, and having a knowledgeable and cooperative nurse. Establishment of village examination centers consisted of two interrelated activities: training of nurses and providing equipment for village examination centers.

GMEIPO ophthalmic personnel trained the nurses of the selected villages. GMEIPO staff developed the training course based on WHO Primary Eye Care guidelines. The training provided 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.

Moreover, the concept of Vision 2020 - The Right to Sight and the role of the nurses in combating the problem of blindness were explained.

In order to be able to provide local primary eye care and screenings, and to identify patients needed referrals to the ROU, the village examination centers were equipped with basic ophthalmic equipment and supplies (flashlight, visual acuity charts for adults, children and illiterates, hand magnifying lens, eye drops, dressings and bandages, etc.). In addition, UNHCR donated eye glasses in support of the project.

As a result of all the described steps, a network of ophthalmic personnel was established in Gegharkunik and Tavush marzes which is an important prerequisite for capacity building towards prevention of blindness.

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. The ratio of ophthalmic surgeons is 64 per million population in the city, and 4 per million in rural areas [1-2].

In 2002, the yearly cataract surgical coverage in Armenia was 3,083 per million in the city, and 158 per million for the rural population. Even though, the national average CSR is approximately 1,000 per million, there is obviously a problem of access and affordability in the more remote areas and therefore a real backlog.

RACSS (Rapid Assessment of Cataract Surgical Services) in Gegharkunik marz, conducted by GMEIPO in 2003, revealed that age and sex adjusted bilateral blindness rate for people 50 years old and over is 0.5%, which is more than twice higher than for developed countries (0.2%). Based on this data and using some methods of extrapolation, GMEIPO estimated that there are approximately 13,000 blind and 19,500 severely visual impaired people in Armenia, with cataract, glaucoma, and diabetic retinopathy as main causes [3].

The efforts of the proposed project were mainly focused on eliminating the striking inequality between eye care in the capital and rural areas. Gegharkunik and Tavush marzes with total population of 400,000 people are selected as project site. The following factors influenced this choice:

- Both provinces are strongly politically and economically affected by conflict in Nagorno-Karabagh because of their geographic location
- There is a large refuge population in both marzes, comprising 30 % of population in Vardenis and 75.5% in Chambarak regions.
- The provinces are economically deprived. During the Soviet period there were several factories (eg. Mineral water plant and Crystal factory) providing many workplaces. At

present, all industrial settings are closed, resulting in high unemployment rate in both marzes.

- There is no secondary eye care in the selected provinces. The staff of Ijevan Regional Ophthalmic Unit (ROU), including an ophthalmologist and ophthalmic nurse, provides primary and, partially, secondary eye care (minor surgery). There are ophthalmologists in Alaverdi, Martuni, Sevan, Gavar, and Vardenis polyclinics, providing only primary eye care. Some regions, such as Dilijan, and Chambarak are lacking primary eye care as well.
- At present there is an on-going project in Sevan sponsored by LCIF (Lions Club International Foundation), which aims to establish a ROU (two ophthalmologists and two ophthalmic nurses) for provision of secondary level of eye care. The proposed project could support the LCIF project and strengthen its human resource development component.

Figure 1. Eye Care Services in Armenia.



- Primary eye care
- Eye departments/ROUs
- Specialized eye clinics

2.0. Project Goals and Objectives

Garo Meghrigian Eye Institute for Preventive Ophthalmology, within the Center for Health Services Research and Development of the American University of Armenia, conducted a 6-month project aimed at blindness prevention in the remote and underserved regions of Gegharkunik and Tavush marzes of Armenia through improving primary eye care and developing secondary/district level of eye care.

The project was focused on human resource development and capacity building in order to develop primary eye care network and support secondary/district level of eye care.

1. ***Human resource development.*** Ophthalmic personnel, including 3 nurses and 3 ophthalmologists from two marzes, received training specifically developed for their needs. Training consisted of local academic training, and local practical training covering both treatment and management skills as appropriate for the person's role in eye care.

The project provided primary eye care training for 20 village ambulatory nurses selected from both marzes, public health ophthalmology and specialized ophthalmic training for the staff of Ijevan and Sevan ROUs, including 3 ophthalmic nurses and 3 ophthalmologists.

2. ***Establish Village Examination Centers.*** Village Examination Centers (1 per 20,000 population/10 villages) were established in selected village health posts to provide primary eye care in rural areas. Overall, 20 Village Examination Centers were established in target marzes and equipped with minimal necessary equipment for basic eye screening and their staff (nurses) trained.

GMEIPO/CHSR staff served as the technical leadership for the project, with the oversight and support of the JMF and MOH.

3.0. Training program for 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).

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 Meghriyan Eye institute 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 consists 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, followed by self-reflection and evaluation as experiential learning methods.

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 form 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 (Appendix 1)

Overall duration of the course was 5 weeks. The first four days of the training course covered 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 were spent to study visual organ anatomy, visual functions and their examination. The 7th day topics covered eye refraction, refractive errors and their correction. On the 8th day, examination of the eye and its accessory apparatus was covered. Starting from the 9th day different eye pathologies were 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 were discussed.

Two days were allocated for preparation for the final oral exam.

On the last day of the training the nurses passed their final exam.

Course assessment and 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 2.

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.

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.

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 more practical exercises.

4.0. Training program for regional ophthalmologists

Another component of the human resource development was training of core ophthalmologic staff. Thus, one ophthalmologist from Sevan ROU (Geghrkunik 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).

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.

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 Centre “Kanakaner 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, followed by self-reflection and evaluation as experiential learning methods.

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 (Appendix 2)

The course included 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 were for learning the visual organ development and anatomy. The next four days covered issues of visual organ physiology, optics and refraction.

On the 7th and 8th days, different methods of visual organ examination, such as external examination, biomicroscopy, ophthalmoscopy, eye electrophysiological and ultrasound examinations were studied. Starting from the 9th day different eye pathologies were discussed, including the eye accessory organs, anterior and posterior segment diseases, eye refraction and refractive errors, myopia, cataract, glaucoma, eye injuries and squint.

The four days of the teaching course (from 16th to 19th) was dedicated to cataracts. During those days the students learned 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 were covered. The students spent most of their time in the operating room participating and assisting in cataract surgery. Days 20 to 22 focused on learning the pathologies of the retina and the optic nerve.

The 23rd - 26th days covered 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 were studied. Day 30 was for binocular vision and squint issues discussion. The 31st day was for individual study and preparation to the examination. On the 32nd day students took the examination on theoretical knowledge and practical skills.

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.

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.

Both students successfully completed the training and they were awarded an official certificate.

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.

5.0. Public Health Ophthalmology Curriculum Development

AUA/GMEIPO staff developed a detailed curriculum for a two-week training for eye care professionals on public health ophthalmology (a copy of the curriculum in English was previously submitted to the Jinishian Memorial Foundation office).

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.

The course curriculum presents the following sections in details:

- Description of student
- Learning needs of students
- Aims and learning outcomes
- Course description
- Conceptual outline and timetable
- Daily session plan
- Application of learning theories to course design and lesson plan

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.

Practitioners are sent by their health district and participation in this course will constitute part of their Continuing Professional Development requirement.

Learning needs of students

To be able to attend the developed course, the trainees are expected to have clinical knowledge of the main blinding diseases and their treatment, to have experience with principles of prevention of the main blinding diseases (including early diagnosis and screening) and have basic knowledge in hygiene, epidemiology and public health. It is not

anticipated from students to know how to manage an eye care programs, how to perform a needs assessment or to have a grant-writing skills.

Aims and learning outcomes

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

Course description

Unlike courses currently available in other settings [4-6], this course is very short and intensive but incorporates aspects of epidemiological research as well as practical application and program design. Because it is short it can be run regularly, impacting the entire ophthalmic community rather than a few specialists.

The course is designed as a mixed-type course incorporating aspects of discipline-based (lectures), experiential (fieldwork and interviews), competency based and problem solving course (writing-up of the eye care needs assessment) designs.

Throughout the course a variety of teaching methods should be employed, including lectures, group works (buzz groups, syndicates, problem-solving groups, brainstorming, open discussions and rounds), and experimental learning methods, such as interviews and project work.

Each teaching day will consist of four sessions, two - morning and two - afternoon, each lasting 1-2 hours.

Assessment

Assessment of the course will be by group written report (50%), multiple choice exam (30%), participation (10%), and presentation (10%).

Participation- 10% of the grade

Each student's contribution to the class and group work and participation in the fieldwork will be assessed, by attendance, timeliness and participation during classes, aiming to motivate students to be more active during the course.

Quiz- 30% of the grade

A multiple-choice questionnaire on Day 5 will test understanding of the lecture material and the exercises covered in group work.

Presentation - 10% of the grade

Students will be asked to work in groups of 2-3 to develop an eye care program 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 [7].

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.

6.0. 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 was fully covered by JMF's contribution.

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 polyclinic. The course was slightly modified and adapted to meet the learning requirements of the trainees.

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 [8]. 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)) [9] 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 [10, 11]. 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 [12, 13]. 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 [14]. 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) [15] 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 [16] 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 [3] and other parts of the world [12] 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. [17, 18].

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 [16, 19], 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 [16]. 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 [12].

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 [20]. 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 [3]. 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 [21, 22].

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 [15].

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 [23]. 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 candidate, lecturer at AUA, presented the core concepts of evaluation. The main objectives,

stages, levels, types and scope of the program evaluation were discussed. Ms. 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 at 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 [24]. 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 [15]. 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 [25].

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 [25].

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 [25]. The rationale 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 [15]. 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 [26], 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 (Appendix 3), 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 from 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.

7.0. Establishment of Village Examination Centers

During the project 20 village examination centers were established (1 per 10 villages/20,000 population), 10 in Gegharkunik and 10 in Tavush marz. The possible locations of the villages in Gegharkunik marz were defined by heads of regional policlinics, and in Tavush marz - by marz health authorities. The following criteria were used to select the villages: being far from regional health institutions, accessible roads, and cooperative nurse.

Establishing Village Examination Centers was an important component of infrastructure development. It consisted of two interrelated activities: training of nurses and providing equipment for village examination centers.

The list of selected villages is attached as Appendix 4.

Training of village nurses

After selection of villages, the nurses were recruited and invited for training. The trainings were developed and organized by GMIPO ophthalmic personnel. Two sessions of trainings were conducted, one in each marz.

The training materials were developed based on World Health Organization (WHO) primary eye care guidelines. The training provided 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. Moreover, the concept of Vision 2020 - The Right to Sight and the role of the nurses in combating the problem of blindness were explained. In addition to theoretical knowledge, basic practical skills used for diagnosis and treatment of eye disorders were also introduced (the upper eye lid eversion, corneal and pupil reactions testing, application of eye drops and ointments, eye pressure measurement using palpation and Maklakov's tonometer, washing of the conjunctival sac, dressing issues, removal of foreign bodies, etc.).

All nurses were provided with brochures on basics of ophthalmology, developed by GMEIPO ophthalmic personnel. 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. After attending both days of the training the nurses were awarded official certificates on completion.

The training was organized in December. Bad weather and snowy roads resulted in absenteeism in Tavush marz. Six nurses out of 10 could 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 polyclinic.

Equipping Village Examination Centers

In order to be able to provide local primary eye care and screenings, and to identify patients needed referrals to the ROU, the village examination centers were equipped with basic ophthalmic equipment and supplies (flashlights with spare batteries, visual acuity charts for adults, children and illiterates, hand magnifying lens, eye drops, dressings and bandages, etc.).

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.

After receiving the training and using the donated equipment, 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.

8.0. Monitoring and Evaluation

Monitoring and evaluation of the trainings

The quality of the trainings was monitored and assured by GMEIPO staff by day to day observations, written feedback from the trainees, feedback from the course instructors, spot checks by the project coordinator and the manager, and trainees' participation during the final exams.

The trainees provided recommendations and suggestions during the evaluation of each course.

Evaluation of the Village Examination Centers

The work of the newly established Village Examination Centers was assessed by the visits of GMEIPO and JMF representatives to randomly selected villages- two villages per marz.

Each village was evaluated based on the following indicators:

- Appropriate use of the donated equipment and supplies
- Number of ophthalmic patients receiving treatment before the training and after it
 - Among them, the number of patients with cataract
- Number of patients referred to regional ophthalmologist or ROU's
 - Among them the number of patients with cataract

Gegharkunik marz

In Gegharkunik marz villages Chkalovka and Geghamavan were selected. The visits to the villages were done after 4 months the centers were established.

Monitoring in Chkalovka village

On 25 April GMEIPO staff visited the village and conducted observations and interview with Shushan Najaryan, the nurse of the village ambulatory. The nurse briefly described her work related to primary eye care, discussed the weaknesses and strengths of the training provided by GMEIPO and gave recommendations for the future improvement of the training. In addition, the future collaboration of this particular ambulatory with the newly established Sevan ROU was discussed.

The nurse showed the medications and equipment provided by GMEIPO. In her everyday work she is using only the chart for visual acuity screening, which is located on the wall, with appropriate lightening. The patient's chair is placed 5 m far from the wall, which corresponds to the standards. Nurse explained that she is not trained enough to examine the anterior part of the eye with the loop and penlight. However, she admitted that the ophthalmologist from Sevan policlinic is using the equipment provided by GMEIPO during her regular visits to the ambulatory.

The nurse reported that during the 4-month period 60 patients were screened in the post, of which 40 were provided with eye glasses and 20 required treatment, of which only one was diagnosed cataract. All of them were screened by the ophthalmologist from Sevan. The day of her visit was announced to the population of the village. Those, who had any eye complaints, attended the ambulatory. Outside the ophthalmologist's visit not many patients visited the ambulatory. However, the new skills that the nurse gained during GMEIPO's training helped her to actively assist ophthalmologist during her work.

From the provided medications, only Gentamicin and Levomicitin eye drops were used in several cases of conjunctivitis. One case of eye trauma applied to the ambulatory and the nurse provided Levomicitin and referred the patient to Sevan policlinic. She complained that

many cases with vernal conjunctivitis came to the ambulatory, but she was not able to provide Dexametason drops. She recommended including corticosteroid eye drops in the package for the next training.

With regards the training itself, the nurse acknowledged the usefulness of the training, since not much attention was given to the ophthalmology during her nursing education. She particularly emphasized the importance of the brochure provided by GMEIPO and relevance of its content to their needs. Concerning the quality of the training, the nurse mentioned good presentation of the material by the lecturers, their willingness to respond to the trainees' questions. As the weakness of the course, she mentioned the short timing. She admitted that in 2 days it was very hard to absorb the theoretical knowledge provided during the lectures. In addition, it was very hard to gain any practical skills. She highly recommended developing and delivering one week course for primary care nurses. She also welcomed the establishment of the Sevan ROU. She expressed her willingness to come to the ROU for practical training. She was interested to refer patients to ROU and work in close collaboration with them.

Monitoring in Geghamavan village

The same day with Chkalovka village, GMEIPO Principal Investigator visited Geghamavan. She conducted the observations and brief interviews with the ambulatory nurses. The village ambulatory was clean and in a good condition, the chart was placed in accordance to the requirements. The patient's chair was in 5 m distance from the chart. Ophthalmic medications were in the shelf for the medicine. Some of them were open and partially used.

The nurses informed that once in every two months the ophthalmologist from Sevan polyclinic visits them and conducts screenings of the population of the village. During the 4-month period only two patients with cataract and one glaucoma suspect applied to the

ophthalmologist. Other patients, attending the screening as well as coming to the ambulatory outside the ophthalmologist's visits, presented minor pathologies, such as conjunctivitis, vernal catarrh, etc. In addition, soon after the training, one nurse announced in the village about availability of eye glasses. Those in a need applied and were provided with the appropriate glasses.

Geghamavan nurses mentioned that it will be more reasonable to establish village examination center for provision of eye care in Ddmashen rather than in Geghamavan, because the ambulatory in Ddmashen is large and supported by international organizations. There are a doctor and a few nurses working at that ambulatory. Ddmashen serves up to 11,000 patients per year, but Geghamavan serves only about 1,000 per year. Ambulatory in Ddmashen could be potentially good collaborator for Sevan ROU.

From Geghamavan ambulatory only one nurse, participated in the training. The nurse confessed that she completed her nursing education 20 years ago and remembered nothing from ophthalmology. According to her, the training was a very good opportunity to gain knowledge and basic skills in primary eye care. She gave a positive appraisal of the quality of the training, which she described as well organized, interesting, and applicable to her day-to-day practice. However, the nurse expressed her interest to get more information on use of the medicine distributed during the training. Also, she mentioned short time for the training, and suggested to organize more comprehensive training for the primary care nurses.

The brochure received during the training the nurse shared with her colleague. Both nurses claimed to read the brochure and expressed their thankfulness to JMF and GMEIPO for it. They characterized it as a very helpful one, and mentioned that they use it quite often.

Tavush marz

In Tavush marz villages Khachardzan and Aghavnavank were selected. The visits to the villages were conducted after 4 months of the centers' establishment.

Monitoring in Aghavnavank village

In Aghavnavank village, the nurse was examining the patients in the village health post. The post was consisted of one well-lit room. There was enough place for patients' examination and for performing primary treatment procedures.

The chart for testing visual acuity, provided in the scope of the project, was placed on the wall according to accepted standards - in a 5 meter distance from the patient, in a patient's eye level.

The nurse was using the penlight and the hand loupe for patient examinations

According to the records, the number of patients who received eye glasses was 8.

One glaucoma suspect was referred to Yerevan for further examination and treatment in specialized eye center. In five cases, the nurse could not provide patients with glasses because of the absence of the glasses with the necessary optical power.

Provided medications were used by the nurse for treatment of conjunctivitis. The drugs were given to patients with the appropriate explanations of their usage.

Monitoring in Khachardzan village

In Khachardzan village the conditions were worse. The health post of the village was in the process of renovation, that is why the nurse was examining the patients at her house. She was performing visual acuity measurement using the old sample of the chart. As she told she was preserving the new one, provided by the GMEIPO staff, for the new ophthalmic unit. She was using the penlight and the hand loupe during the patient examinations. In addition, she was

performing palpator tonometry to all patients. According to her records, the most frequent eye disorder was the “pink eye”. The nurse was using provided medications for treating different conjunctivitis. In one case she removed a conjunctival foreign body and performed the conjunctival sac washing by disinfecting solution. The number of eye glasses, provided by the nurse was 7. Three patients with intraocular foreign body and one child with acute blepharitis were referred to Dilijan for treatment.

9.0. Conclusions/Recommendations

Overall, the project was successful. 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. Moreover, there is no ophthalmic nurse specialization course at NIH.

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

One of the aims of the project was human resources development in Gegharkunik and Tavush marzes for prevention of blindness. To implement the final vision of the project, it was planned that the training process will be a continuing initiative. It was anticipated, that the trainees would transfer their knowledge and experience to their fellows and colleagues.

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.

Training of the village nurses and establishing the village examination centers were important steps of the project. Establishing VECs strengthened the primary level of services. Involving village nurses in the network of ophthalmic care specialists contributed to the creation of trained specialists ready to deliver primary level eye care to the population far from regional polyclinics and ROUs. Timely diagnosis and treatment of blinding diseases and conditions, as well as timely and appropriate referral will play an important role in blindness prevention and reduction.

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

10.0. References

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APPENDIX 1.

**TRAINING PROGRAM FOR OPHTHALMIC NURSES
TIMETABLE**

Date	Session / Theme	Place
1.	9:45-11:45 L1: Organization of surgical care in outpatient department. 12:00-14:30 GW: Discussion of the lecture material. 14:45-16:20 PT: Working in dressing and operating rooms.	Auditorium Oper. room of the eye department
2.	9:45-11:45 L2: Aseptics. 12:00-14:30 GW: Discussion of the lecture material. 14:45-16:20 PT: Clothes, operating equipment, dressing and suture materials sterilization.	Auditorium Oper. room
3.	9:45-11:45 L3: Antiseptics. Infections: types, ways of dissemination, preventive measures. 12:00-14:30 GW: Discussion of the lecture material. 14:45-16:20 PT: Disinfection of premises. Disinfecting solutions' preparation.	Auditorium Oper. room
4.	9:45-11:45 L4: First aid. 12:00-12:45 GW: Discussion of the lecture material. 13:15-16:20 PT: Demonstration of providing first aid.	NIH
5.	9:45-11:45 L 5: Visual organ anatomy. 12:00-14:30 PT: Study of visual organ anatomy on plaster casts and schemes. 14:45-16:20 GW: Discussion of the lecture material.	Auditorium
6.	9:45-11:45 L6: Visual functions and their examination. 12:00-14:30 PT: Visometry, perimetry, binocular vision test, ophthalmometry. 14:45-16:20 GW: Discussion of the lecture material.	Auditorium funct. room
7.	9:45-11:45 L7: Eye refraction. Refractive errors and their correction. 12:00-14:30 PT: Determination of clinical refraction type. Trial glass correction of refractive errors. 14:45-16:20 GW: Discussion of the lecture material.	Auditorium
8.	9:45-11:45 L8: Eye and its accessory apparatus examination. 12:00-14:30 PT: Performing eye and its accessory apparatus external examination. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
9.	9:45-11:45 L9: Eyelid and lacrimal system pathologies. 12:00-14:30 PT: Eye-slit opening technique. Lacrimal pathways' washing and probing. 14:45-16:20GW: Discussion of the lecture material.	Auditorium

10.	9:45-11:45 L10: Diseases of the conjunctiva. 12:00-14:30 PT: Performing conjunctivitis treating procedures (conjunctival sac washing, eye drops instillation, eye ointments and drug tampons application). 14:45-16:20GW: Discussion of the lecture material.	Auditorium
11.	9:45-11:45 L11: Diseases of the cornea and sclera. 12:00-14:30 PT: Performing cornea sensitivity and epithelium tests. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
12.	9:45-11:45 L12: Diseases of the uvea and vitreous body. 12:00-14:30 PT: Performing cyclic pain revealing test. Participation in uveitis treatment. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
13.	9:45-11:45 L13: Diseases of the lens. 12:15-14:30 PT: Premedications and preoperative preparation of patients' for cataract surgery. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
14.	9:45-11:45 L14: Cataract surgery. 12:00-14:30 PT: Assistance in cataract surgery. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
15.	9:45-11:45 L15: Diseases of the retina, optic nerve and visual pathways. 12:00-14:30 PT: Patients' preparation for eye fundus examination. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
16.	9:45-11:45 L16: Glaucoma. 12:00-14:30 PT: Performing tonometry and tonography. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
17.	9:45-11:45 L17: Secondary glaucoma. Glaucoma surgery. 12:00-14:30PT: Glaucoma patients' preoperative preparation and premedications. Assistance in surgery. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
18.	9:45-11:45 L18: Eye injuries. 12:00-14:30 PT: Providing first aid to patients with eye injuries. Assistance in eye injuries' primary surgical processing. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
19.	9:45-11:45 L19: Eye contusions and burns. 12:00-14:30 PT: Providing first aid to patients with eye contusions and burns. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
20.	9:45-11:45 L20: Squint. 12:00-14:30 PT: Working in orthoptic cabinet. Binocular vision test. 14:45-16:20GW: Discussion of the lecture material.	Auditorium

21.	9:45-11:45 L21: Orbital diseases. Ophthalmooncology. 12:00-14:30 PT: Carrying patients with eye tumors. Application of eye compressing bandages. Performing orientative exophthalmometry. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
22.	9:45-11:45 L22: Drug therapy of ocular diseases. 12:00-14:30 PT: Perfoming treating procedures. 14:45-16:20GW: Discussion of the lecture material.	Auditorium
23.	Individual study- preparation for the examination.	
24.	10:00-13:00 Examination on practical skills. 14:00-17:00 Oral examination on theory.	

**APPENDIX 2. TRAINING PROGRAM FOR OPHTHALMOLOGISTS
TIMETABLE**

Day	Session/ Theme	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.	Auditorium
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.	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.	Aud.
4.	9:45-13:00 PT: Improving visual functions examination skills. 13:30-16:20 GW: Methods of visual functions examination.	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.	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.	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. Ophthalmochromoscopy.	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.	
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.	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.	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.	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.	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.	Aud. 44
14.	9:45-11:45 L12: Uvea development abnormalities. Anterior uveitis. 12:00-14:30 PT: Caring patients with uveitis.	Aud.

Appendix 3.

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 4.

The list of villages where Examination Centers were established

Gegharkunik marz

Sevan region, village Chkalovka
Sevan region, village Geghamavan
Vardenis region, village Shatvan
Vardenis region, village Mec Masrik
Gavar region, village Gandzak
Gavar region, village Tsakhkashen
Chambarak region, Chambarak
Chambarak region, village Vahan
Martuni region, village Lichk
Martuni region, village Astghadzor

Tavush marz

Noyemberyan region, village Jujevan
Noyemberyan region, village Baghanis
Ijevan region, village Aghavnavank
Ijevan region, village Khachardzan
Dilijan region, village Hagharcin and Teghut
Ijevan region, village Sarigyugh
Ijevan region, village Berkaber
Ijevan region, village Tskahkavan
Noyemberyan region, village Koti
Noyemberyan region, village Barekamavan