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New Forms of Organizing Ophthalmologic Aid,  
Establishment of the Mobile Structure: Mobile Ophthalmologic Surgical Brigade and Mobile  
Operational – Diagnostic Complex of SBE RS (Y)  
«Yakutsk Republican Ophthalmologic Hospital».

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According to the latest estimations of the All-Russian Health Society blindness in most cases is caused by cataract - 39 %, uncorrected refraction infringements - 18 %, glaucoma - 10 %, yellow stain age degeneration - 7 %, diabetic retinopathy - 4 %. In modern technologic conditions 80 % of blindness cases are prevented or treated [2].

In the world approximately 10 million cataract operations are carried out in a year, and in developing countries the ratio of operations on cataract removal is less than 1000 for the whole population, whereas in the developed countries the given indicator makes 3000 - 4000. For removing the global cataract blindness the quantity of operations should increase up to 30 million by 2020. It means that there is big unsatisfied requirement for cataract surgery. There are four principal causes constraining the growth of cataract surgical treatment: realization of the problem, bad utilities, high cost and remote distance [9].

As to Russia, in order to approach the hi-tech medical aid (HMA) to the residence of patients, the Interbranch scientific and technical complex (ISTC) named after S.N.Fyodorov has been founded and the system of mobile structures «Eye Microsurgery» has successfully been implemented since 1978. There has been a long-term experience of applying the mobile operational ISTC "Eye Microsurgery" in 1978 as a bus for ISTC ES, and in 1989 as a ship [5]. In 1992 the mobile operational-diagnostic complex on the basis of two railway carriages was established by experts from the Orenburg branch of ISTC together with the South Ural railway department that has allowed to carry the newest technologies to patients of remote territories of Orenburgsky oblast [5].

Despite the huge potential of ISTC, even with mobile structures, the requirement of hi-tech medical aid (HMA) in regions of Russia remains enough high. Now HMA is carried out by 22 medical institutions in the country, 9 of them are located in Moscow. For the purpose of HMA availability, republican clinics have started to apply the experience of mobile structures into practice. Departures of experts in various regions of the country for consulting and diagnostic purpose with further direction to surgical treatment are widely spread.

Process of granting of mobile ophthalmologic services and its organizational forms are difficult enough, but are quite realizable. Besides advantages in the qualitative and qualified rendering of the ophthalmologic aid, social and economic aspects as granting of highly skilled ophthalmologic help in remote territories directly in the residence of patients is of great value as it allows to save considerable travel expenses, promoting the increase the level of high-qualified medical aid to the socially-not protected levels of population [6].

In the republic Sakha (Yakutia) the stationary department of SBE RS (Y) Yakutsk Republican Ophthalmologic Hospital with 85 beds is considered the leading specialized establishment where the surgical ophthalmologic treatment is carried out. The power technology of cataract surgery on the basis of ultrasonic phacoemulsification (FE) with implantation of elastic intraocular lenses (IOL) has been implemented in SBE RS YCOH since 2000. In 2010 within YCOH 2426 cataract operations were carried out, 97% of them being by FE method with the implantation of flexible IOL. Despite the growth of surgical activity, the demand for cataract operative treatment remains unsatisfied. The quantity of patients registered in the dispensary list concerning cataract in RC (Y) amounts for 3912 persons, and in 2010 there were 2072 patients addressed with cataract. There is a queue on the planned cataract surgical treatment within 1 year [4].

The Republic Sakha (Yakutia) is the subject of Russia, not having analogues on the planet on the natural and territorial conditions, is located in the northeast of the Euro-Asian continent and is the greatest region of the Russian Federation. On the globe there is no another critical place for human-being existence, except possibly Antarctica [3].

The huge territory can be considered as the distinctive feature of Yakutia, the total area is made up of 3,1 million sq. km.; over 40 % of the territory of the republic is behind the Polar circle; extremely low population density of 0,3 persons per 1 sq. km.; poorly developed transportation essentially limits the freedom of movement. Almost 18 % of the population have no all-the-year-round transport communications, only 14 % have the railway communication, about 5 % have very limited possibilities of departure from their settlements. Accordingly, inhabitants are not provided with constant medical aid, especially with specialized one (1).

Considering the peculiarities of the region, since 2001 YCOH has carried out the mobile work within the voluntary medical insurance (VMI) for rendering the organizational-methodical, advisory and treatment-and-prophylactic help to the population of the remote areas of the republic. Annually from 50 to 100 operations are performed in the republic, 85% of them on cataract removal. Operations were carried out by an extracapsular method with implantation of IOL rigid models and imposing of seam [4].

In order to increase the availability and quality of the hi-tech ophthalmologic aid and to improve the specialized medical aid to the population of republic Sakha (Yakutia) the decree of Ministry of Health (MH) RS (Y) № 01-8/4-117 «About the organization of mobile ophthalmologic surgical brigade rendering the medical aid within the territorial program of Obligatory Medical Insurance RS» was adopted on February 10th 2011 on the basis of SBE RS YCOH [7]. Regulations about the mobile ophthalmologic surgical brigade (EOSB) have been confirmed, its structure being as follows:

- an ophthalmologist-surgeon - 2, an ophthalmologist-diagnostician - 1, an anesthesiologist -1, an operational nurse - 2, an anesthesiologist nurse - 1, a medical technician - 1, a driver - 2. In case of need in the staff of EOSB medical workers CRH can be involved.

For achieving the purpose the brigade is equipped by the phacoemulsificator CataRhex (OERTLI, Switzerland), the operational microscope OM-8 (Takagi, Japan), the manual slot-hole lamp Shin-Nippon XL-1 (Japan), the portable autoclave of "Statim-5000", the ultrasonic system A-scan-OcuScan (Алкон), the portable ref-keratometer Retinomax K-plus (Japan), the ophthalmoscope Heine (Germany), sets of microsurgical toolkit for carrying out cataract and glaucoma operations and out-patient operations.

Heads of the republican medical institution, head physicians of the central regional hospitals should select patients from the attached territories for advisory surveys and surgical treatment, preoperative preparation and postoperative treatment of patients in out-patient conditions, provide with labor conditions for experts of EOSB SBE RS (Y) YROC.

Funding the medical services of EOSB within the Territorial Program OMI is made by the insurance medical organizations on tariffs and payment confirmed by the General (tariff) agreement on payment of medical services, rendered within the Territorial program of Obligatory Medical Insurance of Republic Sakha (Yakutia) [7].

Payment for the treatment of «a finished case» is made in accordance with medical aid standards confirmed by MH RS (Y) in the conditions of subroutine realization «Introduction of medical aid standards» in the program «Modernization of public health service RS (Y) 2011 - 2012».

In total on the profile "ophthalmology" 72 standards are introduced, 35 of them being on the basis of the federal ones. In the activity of EOSB the following nosology standards are confirmed: cataract, glaucoma, anomalies of development and position of eyelids, pterygium.

Payment is made up of following sources:

- From means of the Fund budget – concerning to the limit of assignments on the payment fund and norms of the budgetary service cost confirmed by the governmental decree of

the Republic Sakha (Yakutia) from October 29th, 2007 №440, including indexation of debit items and subitems;

- From means «Programs of modernization of public health service of Republic Sakha (Yakutia)» - on introduction of medical aid standards [8].

Doctors of EOSB determine the presence of indications to operative treatment, estimate the patient's preparedness to operation, hospitalize patients into surgical branch CRH with the documentation required: information consent for rendering medical service, consent for operative treatment and anesthetic allowance, case records, operational papers and etc., and also diagnostics and treatment of patients according to the standards adopted.

The reimbursement connected with patient's hospitalization in regional hospitals is performed by to the contract of refund rendering service between CRH and SBE RS (Y) YROC.

The SBE RS (Y) YROC submits the account and register on medical aid payment to the insurance company for the rendered help to the insured persons of EOSB hospitalized in CRB. The means obtained by SIH «YROC» for rendering the medical aid on payment method- «the finished case of treatment of medical-economic standards» (the mobile form) from means OMI are used on the purposes established according to the tariff structure: extra salary; material expenses.

The material expenses connected with the operations include the cost of medicaments and expenses materials; equipment amortization; other overhead expenses.

Payment for the finished case is made for each mobile medical aid on the basis of the register account of medical aid rendered and payment regulations as well. The sums adopted correspond to average wages.

The payment fund is distributed among workers considering the amount of the operations performed by proportionally established scores reflecting complexity of the work done. The scores reflect intensity of labor expenses per unit of time and qualifying complexity of the operation.

The means of material expenses fund are intended for pay of expenses, connected with the operations performed; acquisition of medicaments and expenses materials, toolkit and accomplishment of expenses connected with maintenance of the mobile form of medical aid and salary in case of well-grounded economy of specified expenses and realization of the plan - task.

The primary documentation of inpatients, hospitalized and treated by EOSB is considered and stored in the SBE RS (Y) YROC and handed out to the head physician for further analysis and estimation of quality of medical aid [7].

In 2011 mobile medical aid was carried out in the Arctic and Northern groups: Verkhniy Kolyma, Zhigansky; in Viljujsky group: Verkhneviljujsky, Viljujsky, Mirninsky, Suntarsky, Njurbinsky; the central areas: Aldan, Amginsky, Gorniy, Lensky, Megino-Kangalassky, Nerjungrinsky, Olekminsky, Tattinsky, Tomponsky, Ust-May, Khangalassky, Churapchinsky.

For 9 months 2011 481 operations were performed, including 439 with PhE, 11 with NPSE, 12 with combined surgery (PhE with IOL + NPSE). All patients spent 1538 days as a whole, average stationary treatment has made 3 days (table №1).

In the EOSB activity the cataract surgery is based on the phacoemulsification technique with implantation of the flexible models IOL having obvious advantages: seamless connection of tissues, reduction of operation time and a period of organism recovery, acceleration of rehabilitation and achievement of its limiting values, patient's satisfactory state, profitability, high efficiency and quality.

In connection with the EOSB organization and inculcation of the new technology as the power cataract surgery with IOL implantation of advanced models, for 9 months 2011 the amount of cataract operations performed by EOSB SBE RS (Y) YROC has exceeded the indices of the mobile work YROC for 2010 in 52 %. The implementation of phacoemulsification technique in the EOSB activity has allowed to render the surgical help to patients with glaucoma and cataract in one-stage, carrying out the combined surgery, 12 phacoemulsification procedures with IOL implantation and not penetrating deep sclerectomy with suprachoroidal drainage.

The quantity of the treated patients within the limits of free medical aid in 2011 has increased up to 185 persons in comparison with indicators of 2010.

When analyzing the EOSB activity it was revealed that of all operated patients 97 % were discharged with recovery, 3 % with improvement (table №2). New forms of the organization of the ophthalmologic help and inculcation of new technologies allow not only to increase the amount of surgical help, and also to improve quality of treatment.

Thus, the introduction of such new forms of ophthalmologic aid in EOSB as the mobile structure (the mobile ophthalmologic surgical brigade and mobile operational - diagnostic complex of SBE RS («the Yakut Republican Ophthalmologic Clinic»)) within the limits of free medical aid; the hi-tech method of cataract surgery phacoemulsification with implantation of IOL advanced models in the EOSB work; «the finished case» treatments under the standards of medical aid confirmed by MH RS (in the conditions of subroutine realization «Introduction of medical aid standards» in the program «Modernizations of public health services RS (2011 - 2012» has allowed:

1. To increase the number of treated patients up to 53 %,

2. To reduce average admission till 50 %.,
3. To raise quality of medical service: according to the data the number of patients recovered has made 97 % ,
4. To increase salary of EOSB on 30,38 % for surgeons, on 43,49 % for operational staff nurses.
5. To cut down budget expenses of the Republic Sakha (Yakutia) in connection with unnecessary of compensation of travel expenses to patients and persons accompanying them, the economy has made 5 000,00 thousand rubles approximately.

The efficient management, introduction of new forms of the labor organization and development of new technologies will allow to satisfy requirement for cataract surgery, to liquidate the queue on planned operative treatment for patients with cataract in RS (Y).

Table 1

**The amount of operations performed by mobile surgeons in 2010  
and by EOSB in 2011**

<b>Nosology</b>	<b>2010</b>	<b>2011</b>
<b>PhE with IOL implantation</b>	<b>232</b>	<b>439</b>
<b>Not penetrating deep sclerectomy (NPSE)</b>	<b>17</b>	<b>11</b>
<b>Combined surgery: PhE with IOL+NPSE</b>	<b>-</b>	<b>12</b>
<b>Pterigium removal</b>	<b>47</b>	<b>15</b>
<b>Lower eyelid bend removal</b>	<b>-</b>	<b>4</b>
<b>Total</b>	<b>296</b>	<b>481</b>

Table 2

**Results of treatment of discharged patients by EOSB in 2011**

Year	Number of discharged	recovery	improvement	No changes	Clinical deterioration
2011	481	470 (97%)	11 (3%)	-	-

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### The resume:

Blindness in most cases is caused by cataract in 39 %. There are four principal causes constraining the growth of cataract surgical treatment: realization of the problem, bad utilities, high cost and remote distance [9]. The republic Sakha (Yakutia) is the greatest region of the Russian Federation. Distinctive feature of Yakutia, are: the huge territory, a total area makes 3,1 million in sq. km., extremely low population density of 0,3 persons per 1 sq. km., not developed transport message. Accordingly, the population is not provided on a constant basis with specialized kinds of medical aid. the introduction of such new forms of ophthalmologic aid in EOSB as the mobile structure (the mobile ophthalmologic surgical brigade and mobile operational - diagnostic complex of SBE RS («the Yakut Republican Ophthalmologic Clinic»)) within the limits of free medical aid; the hi-tech method of cataract surgery phacoemulsification with implantation of IOL advanced models in the EOSB work; «the finished case» treatments under the standards of medical aid confirmed by MH RS (in the conditions of subroutine realization «Introduction of medical aid standards» in the program «Modernizations of public health services RS (2011 – 2012)» will allow to satisfy requirements for cataract surgery, to liquidate the queue on planned operative treatment for patients with cataract in RS (Y).

**Keywords:** cataract, phacoemulsification, mobile structure.

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