

FEDERAL STATE-FINANCED INSTITUTION «THE RUSSIAN ILIZAROV
SCIENTIFIC CENTER
«RESTORATIVE TRAUMATOLOGY AND ORTHOPAEDICS»»
OF THE MINISTRY OF HEALTHCARE AND SOCIAL DEVELOPMENT
OF THE RUSSIAN FEDERATION



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«APPROVED»

A.V. Gubin, Med. Sci. Doct.,
Director of RISC «RTO»

« ____ » _____ 2015

**Curriculum and Program
OF TRAINING FOREIGN SPECIALISTS ON
«TRANSOSSEOUS COMPRESSION-DISTRACTION
OSTEOSYNTHESIS
IN TRAUMATOLOGY AND ORTHOPAEDICS»
CYCLE**

Kurgan – 2015



The system of quality management has been certified for compliance in accordance with GOST R ISO 9001-2008 (State Standard Specifications R ISO 9001-2008).

The Program has been developed by Professor Yu.P. Soldatov, Head of RISC “RTO” Training Division, Med. Sci. Doctor, and N.M. Murzikov, a teacher of Training Division, on the basis of the unified program of postgraduate training of physicians on traumatology and orthopedics (Moscow, 2002), as well as the State educational standard of postgraduate professional training of specialists with higher medical education in the specialty No. 040123 «Traumatology and Orthopedics» (M., 2001), and based on the many-year experience of the staff of traumatology and orthopedics faculty in teaching the discipline for foreign specialists and those of our country.

The Curriculum and Program are designed to train foreign specialists as orthopedic traumatologists in the method of transosseous osteosynthesis (duration of training – 1 month – 144 hours).

The Program has been discussed at the meeting of Training Division in February 14, 2012.

Yu.P. Soldatov, Head of Training Division, Professor, Med. Sci. Doct.

The Program has been approved at the meeting of RISC “RTO” Scientific Board in March 11, 2012, Protocol No. 1.

E.N. Ovchinnikov, Scientific Secretary of RISC «RTO», Biol. Sci. Cand.

EXPLANATORY NOTE

The aim of the cycle of orthopedic traumatologist training is to acquire new theoretical knowledge and professional practical skills necessary for an orthopedic traumatologist for providing skilled care to orthopedic-and-traumatologic patients using the method of transosseous osteosynthesis.

The Program is intended to train transosseous osteosynthesis as a cycle of subject improvement for foreign specialists with the training duration of 144 hours.

Training of specialists is performed using the following forms: practical classes, workshops, work in the operating room, lectures, seminars.

Controlling knowledge, skills, test control should be made in the process of training. A final exam is carried out at the end of the cycle.

The Program consists of a subject-training plan, a list of the subjects of practical classes and lectures, test questions, list of literature.

CURRICULUM

Title of sections	Number of hours			
	lectures	pract. classes	seminars	Total
<u>General issues</u>	2	5	–	7
Organization and work of orthopedic-and-traumatologic departments on treatment of patients and injured persons using transosseous osteosynthesis method	–	2	–	2
Anesthesia performance for traumatologic and orthopedic surgeries	–	1	–	1
Methods of examination of traumatologic and orthopedic patients	–	2	–	2
Details of injury treatment in patients of different age	2	–	–	2
<u>Compression-distraction osteosynthesis in traumatology and orthopedics</u>	16	101	10	127
Theoretical issues of compression-distraction osteosynthesis	2	–	–	2
Compression-distraction osteosynthesis in traumatology	6	30	4	40
Compression-distraction osteosynthesis in treatment of injury consequences	2	21	2	25
Compression-distraction osteosynthesis in orthopedics	4	32	2	38
Compression-distraction osteosynthesis for pyogenic infection	2	18	2	22
<u>Rehabilitation of traumatologic and orthopedic patients</u>	2	4	–	6
General issues of rehabilitation	0,5	–	–	0,5
Medical rehabilitation of patients with bone and joint injuries	0,5	2	–	2,5
Medical rehabilitation of patients with orthopedic pathology of the locomotor system and with injury consequences	1	2	–	3
Exam	–	–	4	4
<u>Total:</u>				144

PROGRAM

COMPRESSION-DISTRACTION OSTEOSYNTHESIS IN TRAUMATOLOGY AND ORTHOPEDICS

Organization of orthopedic-and-traumatologic care

Organization and work of orthopedic-and-traumatologic departments on treatment of patients and injured persons using transosseous osteosynthesis method

Anesthesia performance for traumatologic and orthopedic surgeries

Local anesthesia. Intraosseous anesthesia. Intraspinal anesthesia. Peridural anesthesia.
Details of general anesthesia for traumatologic and orthopedic surgeries.

Methods of examination of traumatologic and orthopedic patients

Special methods of examination of traumatologic patients.

Clinical roentgenology of bone and joint injuries. A roentgenologic method of skeletal examination. A technique of x-ray reading. The roentgenologic norm for bones. Roentgen diagnostics for the upper and lower limb bone injuries.

Positioning details to make roentgenography of limb and joint segments.

Contrast roentgenography.

Angiographic techniques.

Pneumographic techniques of examination.

Computer tomography technique.

Ultrasound techniques of examination.

Special features of the process of bone tissue regeneration in different age-related periods

Bone tissue regeneration in children.

Physical and mental condition of elderly and senile patients.

Change in organ and system function in elderly and senile patients.

Age-related changes in the locomotor system. Bone tissue reparation for bone fractures in elderly and senile subjects.

Details of injury treatment in patients of different age

Treatment of traumatic injuries in children of different age groups. Features of surgical treatment of elderly and senile injured persons. Preoperative preparation and postoperative management of elderly and senile patients.

Theoretical issues of compression-distraction osteosynthesis

The Ilizarov fixator and its technical characteristics.

Biomechanical basics of compression-distraction osteosynthesis.

Features of bone regeneration in compression-distraction osteosynthesis. Reparative regeneration in compression, distraction, distraction epiphysiolysis. Reparative regeneration in compression-distraction osteosynthesis for bone fractures, pseudoarthroses, defects.

Compression-distraction osteosynthesis in traumatology

Details of transosseous osteosynthesis in treatment of fractures in children.

Details of transosseous osteosynthesis in treatment of fractures in elderly and senile subjects.

The principles of treatment of multiple and combined injuries of the locomotor system. Details of transosseous osteosynthesis for multiple and combined injuries.

Details of treatment of intra- and periarticular fractures.

Transosseous osteosynthesis with the Ilizarov fixator in treatment of patients with open fractures.

Treatment of patients with open fractures of limb segments with tissue defects.

The tactical details of surgical treatment and postoperative management of wounded persons with gunshot limb fractures.

Transosseous osteosynthesis for limb bone shaft fractures.

Transosseous osteosynthesis for fractures of leg condyles: techniques of manual reposition; particular features of skeletal traction.

Errors and complications in transosseous compression-distraction osteosynthesis.

Compression-distraction osteosynthesis in treatment of injury consequences

Compression-distraction osteosynthesis in treatment of patients with injury consequences. Technical performance of the method.

Defects and pseudoarthroses of long tubular bones. Disease classification. Clinical-and-roentgenological characteristics of anatomic changes and functional disorders. Calculation of the true amount of bone defect to plan its filling. Biomechanical principles of osteosynthesis designing for defects and pseudoarthroses.

The basic configurations of the fixator in treatment of patients with defects and pseudoarthroses depending on their localization and shape of articular ends. Recovery of the disordered relations in joints for pathology. Surgical interventions in bones for defects and pseudoarthroses. Issues of psychotherapy and kinesitherapy.

The zones of optimal and safe insertion of wires in the humerus. The techniques of transosseous osteosynthesis and management of patients for humeral pseudoarthroses and defects.

The zones of optimal and safe insertion of wires in the forearm. The techniques of transosseous osteosynthesis and management of patients for pseudoarthroses and defects of forearm bones.

The zones of optimal and safe insertion of wires in the femur. The techniques of transosseous osteosynthesis for femoral pseudoarthroses and defects.

The zones of optimal and safe insertion of wires in the leg. The techniques of transosseous osteosynthesis for pseudoarthroses and defects of the leg.

Errors and complications in treatment of patients with defects and pseudoarthroses of long tubular bones. Prevention and treatment.

The principles of treatment of patients with posttraumatic contractures and deformities of joints. The techniques of treatment of posttraumatic contractures and deformities of joints. Errors and complications. Prevention and treatment.

Osteoarthroses. Treatment using a compression-distraction fixator.

Compression-distraction osteosynthesis in orthopedics

Biomechanical principles of limb lengthening, details of osteosynthesis, basic configurations of the fixator in limb lengthening. Role of exercise therapy. Postoperative management of patients.

Humeral lengthening. Indications and contraindications for humeral lengthening. Details of wire insertion. Osteotomies of the humerus. The procedure of lengthening at one and two levels. Postoperative management of patients.

The techniques of transosseous osteosynthesis for forearm lengthening depending on radius and ulna relations.

Details of wire insertion for mono- and bilocal lengthening of the femur. Indications for wire insertion to protect joints. Postoperative management of patients.

The techniques of transosseous osteosynthesis for leg lengthening at one and two levels, in case of the fibula absence.

Limb deformity. Classification. Systemic diseases of the locomotor system. Biomechanical justification of using transosseous osteosynthesis techniques in treatment of limb deformities.

The Ilizarov fixator for deformity correction. Biomechanical justification of hinging supports. Calculation of deformity correction rates.

Humeral deformities. Humeral lengthening with simultaneous deformity correction.

Forearm deformities. The techniques of transosseous osteosynthesis depending on forearm bone relations. Radial and ulnar clubhand.

Lower limb deformity. Transosseous osteosynthesis techniques, the role of hinging the fixator supports.

Articular contractures of the upper and lower limbs. Surgical and bloodless correction of deformities and contractures using a device for transosseous fixation.

Errors and complications of treatment of patients with limb shortenings and deformities using the Ilizarov fixator.

Treatment of patients with orthopedic pathology in case of the presence of pyogenic infection

Indications and contraindications for transosseous osteosynthesis performance in patients with pyogenic infection.

The details of technical osteosynthesis performance and mounting a device for transosseous fixation.

Indications for performing open and bloodless osteosynthesis, a technique of osteomyelitic focus treatment, selection of a draining type.

Transosseous osteosynthesis of pseudoarthroses complicated by osteomyelitis.

Transosseous osteosynthesis of defects complicated by osteomyelitis.

Transosseous osteosynthesis for long bone deformities complicated by osteomyelitis.

Transosseous osteosynthesis in the presence of osteomyelitic cavities.

Special features of postoperative management of patients.

Indications for antibacterial therapy.

Possible errors and complications in treatment of patients with osteomyelitis by transosseous osteosynthesis method, their prevention and elimination.

General issues of rehabilitation

Physiotherapy and exercise therapy in patients after transosseous osteosynthesis performance.

The role of exercise therapy in limb lengthening, deformity correction.

Techniques of exercise therapy.

Medical rehabilitation of patients with injuries of bones and joints

Rehabilitation of patients with injuries of the upper limb bones.

Rehabilitation of patients with injuries of the lower limb bones.

Rehabilitation of patients with injuries of the spine.

Rehabilitation of patients with pelvic bone fractures.

Medical rehabilitation of patients with orthopedic pathology of the locomotor system and injury consequences

Rehabilitation of patients with acquired diseases of the locomotor system (consequences of inflammatory bone and joint diseases, posttraumatic deformities of bones and joints, paralytic deformities, deformities of the spine, degenerative diseases of the spine and joints, malignant and benign tumors), congenital diseases of the locomotor system: with congenital dislocation of the hip, congenital developmental anomalies of the upper and lower limbs, systemic skeletal diseases.

TEST CONTROL

1. It's possible to solve the following problems using the technologies of transosseous osteosynthesis:
 - a) transverse transporting of bone fragments
 - b) longitudinal transporting of bone fragments
 - c) rotational transports of bone fragments
 - d) correction of angular deformities
 - e) all is right

2. Once corticotomy is made, distraction should be started on:
 - a) Day 3-4 after surgery
 - b) Day 5-6 after surgery
 - c) Day 7-8 after surgery
 - d) Day 10 after surgery

3. What type of bone union is provided by stable fixation with the Ilizarov fixator?
 - a) endosteal
 - b) periosteal
 - c) mixed

4. The maximal amount of acute repositioning for treatment of an advanced fracture by the method of transosseous osteosynthesis should be:
 - a) a) 1-5 mm
 - b) 0.8-1 cm
 - c) 1-1.5 cm
 - d) 2 cm

5. What nerve can be injured most often in case of humeral middle-shaft fracture?
 - a) a) median nerve
 - b) ulnar nerve
 - c) radial nerve

6. A wire with stopper is inserted additionally 2-3 cm below the support for lengthening of the leg upper third for the purpose of fixation reinforcement. How should it be done?
 - a) from the outside
 - b) from the inside

7. What kind of deformity develops in case of leg lengthening in the upper third?
 - a) valgus
 - b) recurvation
 - c) antecurvation
 - d) varus

8. What should be done when the clinical-and-roentgenological signs of premature bone consolidation appear in the zone of lengthening?
 - a) a) to stop distraction
 - b) to stop distraction and decrease the distraction forces in the fixator
 - c) to increase distraction rate
 - d) to produce refracture of newly formed bone
 - e) (c), (d) – right

9. The amount of lengthening depends on the following:
- a) the amount of shortening
 - b) the condition of soft tissues
 - c) a patient's age
 - d) function of joints
 - d) all is right
10. Distraction start depends on the following:
- a) osteotomy level (metaphysis, diaphysis)
 - b) displacement of fragments
 - c) bone tissue structure
 - d) a patient's age
 - e) all is right
11. The following feet deformities occur most often in case of congenital pseudoarthroses of leg bones:
- a) calcaneal
 - b) valgus
 - c) varus
 - d) equinus
12. Most often the first clinical manifestation of bone cyst is the following:
- a) pathologic fracture
 - b) segment deformity
 - c) pain and limitation of movements in adjacent joints
13. The average daily rate of non-free autograft transporting for bone defect filling is the following:
- a) 0.25 mm
 - b) 0.5 mm
 - c) 0.75 mm
 - d) 1.0 mm
 - e) 1.5 mm
14. The following pseudoarthroses are the most often to occur in clinical practice:
- a) femoral
 - b) tibial
 - c) those of forearm bones
 - d) humeral
15. What type of transosseous osteosynthesis is used for traumatic osteoepiphysiolysis:
- a) neutral
 - b) compression
 - c) distraction
16. What deformity is most often recurring in case of congenital clubfoot:
- a) equines
 - b) supination
 - c) arch of foot (inflexion)
 - d) forefoot adduction
17. The details of selecting the Ilizarov fixator supports under pyogenic conditions:
- a) as usually

- b) less in diameter
- c) greater in diameter

18. The following is involved in inflammatory process for hematogenous osteomyelitis:

- a) only bone marrow
- b) bone marrow and compact bone
- c) periosteum
- d) surrounding soft tissues
- e) all of the above

19. The causes of possible complications in case of improper using the techniques of treating orthopedic diseases with the Ilizarov fixator:

- a) inadequate knowledge of treatment techniques
- b) wire insertion without taking «soft tissue reserve» into consideration
- c) late exercise therapy and limb weight-bearing
- d) failure to comply with the technologies of lengthening of a limb or its deformity correction
- e) all is right

20. In case of limb swelling during lengthening the following is indicated:

- a) temporary cessation of lengthening
- b) making control x-rays
- c) decrease of distraction rate
- d) subsequent tactics should be determined depending on x-ray data

ANSWERS

1 – e	6 – b	11 – a	16 – d
2 – b	7 – a, c	12 – b	17 – c
3 – a	8 – e	13 – d	18 – e
4 – b	9 – e	14 – b	19 – e
5 – c	10 – e	15 – a	20 – d

Test questions

1. Rules of inserting wires, their tensioning and fixing in the rings of the device for transosseous fixation.
2. Biomechanical substantiation of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS with the Ilizarov fixator.
3. Variants of wire tensioning in the supports of the Ilizarov fixator.
4. Classification of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS according to Ilizarov.
5. The Ilizarov fixator. Design features. Description of elements and units. Specifications.
6. Types of wire sharpening. The advantages and shortcomings of each of them.
7. General principles of wire insertion to perform TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS.
8. Making «maintaining» tensioning of wires.
9. Details of patient management for distraction osteosynthesis.
10. Exercise therapy for transosseous osteosynthesis.
11. Organization of out-patient treatment by the method of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS.
12. Fractures and fracture-dislocations of the humerus surgical neck. Principles of reposition, the scheme of the fixator mounting. Management of patients after osteosynthesis.
13. Humeral shaft fractures. The techniques of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS. Possible errors and complications.
14. Trans- and supracondylar humeral fractures. Osteosynthesis variants. Management of patients.
15. The schemes of wire insertion in the upper, middle and lower thirds of the forearm in view of clinical anatomy.
16. Olecranon fractures. Variants of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS. Management of patients.
17. Fractures of both forearm bones. Schemes of the fixator mounting.
18. Possible errors and complications of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS of the humerus.
19. Monteggia's fractures. The sequence of wire insertion. The scheme of the fixator mounting.
20. Galeazzi's fractures. The sequence of wire insertion. The scheme of the fixator mounting.

21. Radius fracture in the typical place. Reposition using the Ilizarov fixator.
22. Possible errors and complications of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS of forearm bones according to Ilizarov.
23. Femoral neck fractures. Wire insertion in the proximal femur and the Ilizarov fixator mounting. Management of patients after osteosynthesis.
24. Femoral fractures in the proximal shaft. Typical displacement of fragments. Special features of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS.
25. Femoral shaft fractures. Possible errors and complications. The fixator mounting.
26. Fractures of tibial condyles. Classification. The principles of reposition and fixation according to Ilizarov. Schemes of the fixator mounting. Postoperative management of patients.
27. Management of patients after osteosynthesis performance for femoral fractures.
28. Errors and complications in treatment of femoral fractures by the method of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS.
29. Patellar fractures. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS of the patella.
30. Leg shaft fractures. Possible variants of the fixator configuration depending on fracture character and level. Postoperative management of patients.
31. The sequence of osteosynthesis performance for trimalleolar fractures. The scheme of the fixator mounting.
32. Variants of the reposition and fixation of the tibial posterior edge.
33. The sequence of osteosynthesis performance for bimalleolar fractures. Variants of fixator configuration.
34. Management of patients with intraarticular fractures.
35. Possible errors and complications in the process of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS performance with the Ilizarov fixator for leg bone fractures and during subsequent management of patients.
36. Possible errors and complications in the process of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS performance for intraarticular fractures and during subsequent management of patients.
37. Calcaneal fractures. Typical displacements. Variants of the fixator configuration.
38. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for multiple and combined fractures. Surgical tactics. Schemes of the fixator mounting. The sequence of osteosynthesis performance.
39. Advanced and malunited fractures, methodical classification. Variants of the fixator configuration at the stages of reposition.

40. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS in treatment of open fractures of long tubular bones.
41. Wound debridement for open fractures, the principles of performing reposition of fragments and their fixation.
42. The principles of reposition, adaptation and fixation of fragments in treatment of comminuted fractures of long tubular bones using the Ilizarov fixator.
43. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS in treatment of severe open fractures of long tubular bones with extended bone tissue defects.
44. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS in treatment of severe open fractures accompanied by vascular and nerve injuries.
45. Prevention of severe pyogenic complications in treatment of open fractures of long tubular bones (using TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS according to Ilizarov).
46. Clinical and roentgenologic criteria to stop fixation with the fixator during fracture treatment.
47. Techniques for elimination of rotational displacements.
48. General principles of treatment of malunited fractures (schemes of division into groups, treatment task, rate and rhythm of displacement elimination).
49. General principles of deformity correction for pseudoarthroses (biomechanical principles of the fixator application).
50. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of flail pseudoarthroses.
51. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of humeral pseudoarthroses (details of osteosynthesis performance, exercise therapy).
52. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of forearm pseudoarthroses (details of osteosynthesis).
53. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of femoral pseudoarthroses.
54. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of leg pseudoarthroses.
55. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of leg defects with the Ilizarov fixator.
56. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of femoral defects with the Ilizarov fixator.
57. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of humeral defects.

58. TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS for treatment of the defects of forearm bones.
59. General principles of treatment of long tubular bone pseudoarthroses in the presence of pyogenic infection by the method of TRANSOSSEOUS COMPRESSION-DISTRACTION OSTEOSYNTHESIS.
60. Defect filling in the presence of pyogenic infection (general principles).
61. General principles of limb lengthening.
62. The technique of distraction epiphysiolysis.
63. Simultaneous femur and leg lengthening according to Ilizarov.
64. Reconstructive surgeries for congenital unilateral dislocation of the hip.
65. Femoral lengthening with the Ilizarov fixator.
66. Techniques of leg lengthening.
67. Lengthening and modeling of the leg shape.
68. Foot deformity correction for congenital clubfoot.
69. Leg lengthening and foot deformity correction for congenital shortening of the leg and fibular absence.
70. Surgical lengthening of the humerus.
71. Arthrodesis of the hip. Closed arthrodesis of the hip with simultaneous femoral lengthening.
72. Arthrodesis of the knee. Lengthening arthrodesis of the knee.
73. Arthrodesis of the ankle, the scheme of the Ilizarov fixator.
74. Triarticular arthrodesis. The scheme of the Ilizarov fixator configuration.
75. Correction of femoral neck varus deformity.
76. The fixator configuration for deformity correction over segment extension.
77. The fixator configuration for the knee deformity correction.
78. Defect filling in the presence of pyogenic infection (general principles).
79. The principles of weight-bearing recovery in patients with injuries of the lower limb bones (walking training, gradually decreasing of the load after the fixator removal).
80. The general principles of exercise therapy for treatment of the upper limb shortenings.
81. The general principles of exercise therapy for treatment of the upper limb shortenings.
82. The general principles of exercise therapy for injuries of the lower limb bones.
83. The general principles of exercise therapy for injuries of the upper limb bones.

The literature recommended

1. Shevtsov V.I., Diachkov A.N., Khudiaev A.T. Substitution of cranial defects by bone transport // Craniofacial distraction osteogenesis / Eds M.L. Samchukov, J.B. Cope, A.M. Cherkashin. – Mosby, 2001. – P. 547-560.
2. Pseudoarthroses, defects of the upper limb long bones and contractures of the elbow (base technologies for treatment with the Ilizarov fixator) / V.I. Shevtsov, V.D. Makushin, L.M. Kuftyrev, Y.P. Soldatov. - Kurgan, 2002. - 413 p.
3. Shevtsov V., Makushin V.D., Kuftyrev L.M. Defects of the Lower Limb Bones. - Kurgan, 2000. - 682 p
4. Shevtsov V.I., Desiatnichenko K.S. Development and experimental evaluation of preparations from mature bone tissue. Chapter 9 // Skeletal Reconstruction and Bioimplantation. Ed. by T. Sam Lindholm. - Springer, 1997. - P. 81-95.
5. Shevtsov V.I., Popkov A.V. Surgical lengthening of the lower limbs. – Kurgan, 2002. – 222 p.
6. Faure C. Transfixation: Atlas of Anatomical Sections for the External Fixation of Limbs / C. Faure, Ph. Merloz (Translated by J.E. Robb). – Berlin, Heidelberg, New York, London, Paris, Tokyo: Springer-Verlag, 1987.
7. Ilizarov method: achievements and Prospectives. - Kurgan, 1993.
8. Nationally Ilizarov Method Course. - Ahmedabad, 1997.