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Current issues in the formation of the rehabilitation system for victims with fractures of the long bones f the limbs in martial law conditions

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The problem of treating fractures of the long bones of the limbs (FLB) does not lose its relevance, since among all injuries of the locomotor system, they occur most often and are accompanied by various complications. According to the literature, in 38 % of patients, disability from injuries of the locomotor system is due to its functional disorders, and in most cases it can be prevented by following the correct rehabilitation measures. Objective. To analyze and determine the most important factors for the formation of a rehabilitation program for patients with FLB and to evaluate the effectiveness of these measures. Methods. A medico-social analysis of the results of treatment of 63 patients (41 men and 22 women) with FLB, including those with flammability, who received treatment at the «Sitenko Institute of Spine and Joint Pathology NAMS of Ukraine» in 2020–2021. Of them, 63.5 % had multiple injuries, in 2020 — 64.3 %, in 2021 — 62.8 %. The results. The clinical and functional state of the patients was analyzed, taking into account the nature of the injury and the location of the fractures, depending on the level of rehabilitation potential. The main organizational principles of providing medical assistance and rehabilitation to victims of FLB have been defined and formulated. The rehabilitation groups of patients are characterized, the main factors affecting the rehabilitation potential and rehabilitation prognosis are determined. The main principles that must be taken into account when drawing up an individual rehabilitation program for patients with FLB are formulated. Conclusions. The conducted studies showed that the proposed principles of creating a medical rehabilitation program for patients with fractures of the long bones of the limbs made it possible to more objectively substantiate the scope and terms of restorative treatment at all stages of rehabilitation and specify the structure of rehabilitation measures for every case, that, finally, made it possible to develop individual rehabilitation programs for these patients and improve the results of their treatment.

Проблема лікування переломів довгих кісток кінцівок (ПДКК) не втрачає актуальності, оскільки серед усіх ушкоджень опорно-рухової системи вони трапляються найчастіше та супроводжуються різноманітними ускладненнями. За даними літератури, у 38 % хворих інвалідність від травм опорно-рухової системи обумовлена її функціональними порушеннями, і в більшості випадків може бути попереджена шляхом дотримання правильних реабілітаційних заходів. Мета. Проаналізувати і визначити найвагоміші чинники для формування програми реабілітації хворих із ПДКК та оцінити ефективність цих заходів. Методи. Проведено медико-соціальний аналіз результатів лікування 63 пацієнтів (41 чоловік і 22 жінки) із ПДКК, у тому числі й з вогнепальними, які отримали лікування в ДУ «ІПХС ім. проф. М. І. Ситенка НАМН України» у 2020–2021 рр. Із них із множинними ушкодженнями було 63,5 %, у 2020 р. — 64,3 %, у 2021 — 62,8 %. Результати. Проаналізовано клініко-функціональний стан хворих з урахуванням характеру травми і локалізації переломів, залежно від рівня реабілітаційного потенціалу. Визначені та сформульовані основні організаційні принципи надання медичної допомоги і реабілітації постраждалим із ПДДК. Охарактеризовано реабілітаційні групи пацієнтів, визначені головні чинники, які впливають на реабілітаційний потенціал і реабілітаційний прогноз. Сформульовані основні принципи, які необхідно враховувати під час складання індивідуальної програми реабілітації хворих із ПДКК. Висновки. Проведені дослідження показали, що запропоновані принципи створення програми медичної реабілітації для хворих із переломами довгих кісток кінцівок дозволили об'єктивніше обґрунтувати обсяг і терміни відновного лікування на всіх етапах реабілітації та конкретизувати в кожному випадку структуру реабілітаційних заходів, що, насамкінець, дозволило розробити індивідуальні програми реабілітації для цих хворих і покращити результати їхнього лікування. Ключові слова. Переломи, довгі кістки, кінцівки, реабілітація, реабілітаційний прогноз, реабілітаційний потенціал, реабілітаційні групи, інвалідність.

Key words. Fractures, long bones, limbs, rehabilitation, rehabilitation prognosis, rehabilitation potential, rehabilitation groups, disability

Introduction

Traumatic fractures of human musculoskeletal system in the conditions of war are characterized by polymorphism due to multifactorial mechanisms of their occurrence. They can be caused by both firearms impact (military actions) and domestic accidents, but the main connecting point is that they are usually associated with high-energy injuries.

Ever since the First World War, the structure of combat injuries of the locomotor system has been dominated by limb injuries, accounting for 50 to 70 %. In modern military operations, such injuries account for 65–75 %, and in some combat operations, even 80% or more [1–4]. According to the information of Ukrainian doctors, during the military operations in Donbas in 2014–2021, the share of limb injuries was equal to 62.6 %, of which upper limbs — 35.7 %, lower limbs — 64.3 % [5].

A characteristic feature of modern wars is a large proportion of combined and multiple wounds (32.1 %), the prevalence of shrapnel (62.9 %) and explosive (25.6 %) injuries [1, 6].

The issue of timely diagnosis, effective treatment and rehabilitation of patients with traumatic fractures of the long bones of the limbs remains an urgent problem, especially in the conditions of the current state of war in Ukraine. This is due to the fact that these injuries are characterized by:

– an increase in the number of severe multiple open fractures [1, 5];

– adjacent muscles, joints, and neurovascular formations are usually injured together with the bones [3, 7, 8];

– the special danger of such fractures is hemorrhage into the adjacent muscles, which causes serious complications in the form of their ischemia — «compartment syndrome» and necrosis, and, as a consequence, amputation of the limb [9].

It is important to take into account all these factors, evaluating them at all stages of providing medical care, namely: during primary surgical treatment of wounds and stabilization of fractures, during inpatient treatment and at the stages of rehabilitation. In our study, we highlight important issues of forming a rehabilitation program for patients with fractures of the long bones of the limbs.

According to the literature, in 38 % of patients, disability as a result of injuries of the locomotor system is due to its functional disorders and can mostly be prevented by taking the appropriate rehabilitation measures [10–16].

The patient rehabilitation system is a multi-component complex of medical and social measures, which provides for their consistent implementation in the following main directions: medical, social, professional and psychological rehabilitation.

The main ultimate goal of medical rehabilitation is to achieve comprehensive restoration of functional disorders of organs or body systems caused by diseases or trauma. It provides for the optimal realization of the patient's physical and mental capabilities, as well as the social adaptation, the most adequate integration of patients into society [17].

An important factor of rehabilitation measures is their complexity, continuity and consistency. Scientific research conducted at Professor M. I. Sytenko Institute in the 2010s showed that lack of comprehensiveness during the implementation of rehabilitation measures negatively affects the results of treatment, social and labor adaptation of patients [13, 17–19].

The rehabilitation program is a list of medical, household and social methods aimed at solving the specific goal of rehabilitation of a sick or disabled person. Its creation requires application of a set of procedures — medical, psychological, social, professional, as well as household and labor adaptation [16, 20].

Initial medical rehabilitation of sick and disabled patients is carried out in specialized hospitals. After completion of rehabilitation, the rehabilitation doctor assesses the level of achieved results and draws up an individual medical rehabilitation program (IRP). Upon completion of inpatient treatment and rehabilitation, the medical and social expert commission determines the patient's condition in accordance with clinical criteria and functional characteristics. All this is characterized by a functional class of disorders (FC), from FC0 to FC4 [20].

It is important to emphasize that in orthopedics and traumatology, medical rehabilitation requires the joint activity of representatives of many medical specialties: orthopedists-traumatologists, therapists, surgeons, neurologists, physiotherapists, physical rehabilitation doctors and methodologists, massage therapists, psychologists [20–22]. The involvement of specialists from several specialties contributes to increasing the effectiveness of rehabilitation measures and improving their results.

Purpose: to analyze and determine the most important factors for a rehabilitation program for patients with fractures of the long bones of the limbs (FLBL) and to evaluate the effectiveness of these measures.

Material and methods

The materials of the study were discussed and approved at the meeting of the Bioethics Committee at the State Institution «Professor M. I. Sytenko Institute of Spine and Joint Pathology of the National Academy of Sciences of Ukraine» (Protocols No. 214 of 19.04.2021, No. 222 of 20.12.2021).

The study involved medical and social assessment of treatment outcomes in 63 patients with fractures of the long bones of the limbs, including those with gunshot fractures, based on the materials of Professor M. I. Sytenko Institute for 2020–2021. Among them there were 41 (65 %) men, 22 (35 %) women. The majority of patients who received injuries to the upper and lower extremities were of working age: 26 people (92.8 %) in 2020 and 21 (60 %) in 2021. The distribution of patients according to the nature of the injury is presented in the Table 1, showing predomination of patients with multiple injuries, namely: 63.5 %, 64.3 % in 2020, 62.8 % in 2021.

At the same time, assessment of the localization of fractures (Table 2) and it was showed that the majority of patients with bone fractures of the lower extremities comprised 73.0 %, while in 2020 their share was 60.8 %, and 82.8 % in 2021, i. e. there was an upward trend.

Results and their discussion

In order to improve the rehabilitation process for FLBL patients, based on the analysis of the literature and our own research, we determined and defined the main organizational principles of providing medical care and rehabilitation to FLBL patients. Further on, it had an additional significance for the formation of an individual rehabilitation program for FLBL patients (Fig. 1).

As our unbiased analytical experience has shown, compliance with these principles provides a better solution to the tasks of both inpatient treatment and rehabilitation. Clinical studies show that during the treatment of patients with traumatic injuries of the long bones of the limbs, improvement of treatment outcomes, optimization of rehabilitation measures and reduction of disability indicators essentially require adherence to the following rules:

1. To make the correct and complete clinical and functional diagnosis in a timely manner.

2. At the stage of inpatient treatment, to provide a detailed expert and rehabilitation assessment of physiofunctional disorders of the injured segments.

3. When creating a rehabilitation program, to determine such important indicators as rehabilitation potential (RP) and rehabilitation prognosis (RPr) individually for each patient during treatment. These are the main factors when planning the stages and scope of rehabilitation measures.

4. At the stage of inpatient treatment and based on the implementation of points 1–3. To form clinical rehabilitation groups and individual rehabilitation programs.

5. Every year, especially during the first 2–3 years of rehabilitation, to observe a clear interaction of such medical structures as «hospital-polyclinic-Medical Social Expert Committee (MSEC)». The main purpose of their work is the analysis, assessment and correction of rehabilitation measures during the implementation of IRP.

RP assessment involves the main clinical and functional indicators, such as localization and degree of structural and functional disorders of the musculoskeletal system, the nature of the displacement of fragments of the damaged bone, shortening of the limb, the condition of adjacent joints, local vascular or neurological disorders, the stage of the traumatic disease, as well as complications of other organs or body systems [18, 20].

When assessing the degree of RP quality, it is important to take into account factors of the treatment process that affect the rehabilitation prognosis (Fig. 2).

Table 1

Distribution of patients with FLBL according to the nature of the injury

Age		Nature of injury		Total
		multiple	isolated	
2020	abs.	18	10	28
	%	64.3	35.7	100.0
2021	abs.	22	13	35
	%	62.8	37.2	100.0
Total	abs.	40	23	63
	%	63.5	36.5	100.0

Table 2

Distribution of patients by localization of FLBL

Age		Limb		Total
		upper	lower	
2020	abs.	11	17	28
	%	39.2	62.8	100.0
2021	abs.	6	29	35
	%	17.2	82.8	100.0
Total	abs.	17	46	63
	%	27.0	73.0	100.0

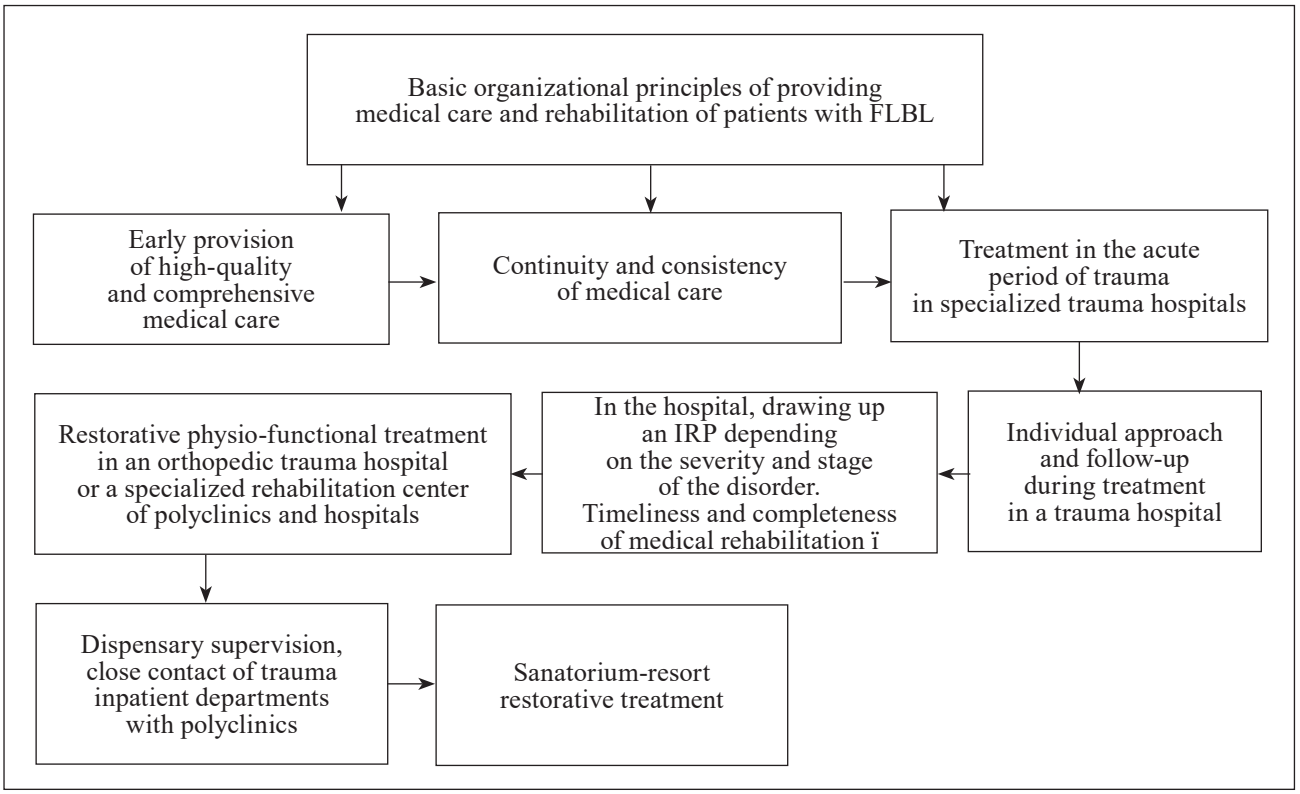

Fig. 1. Basic organizational principles of providing medical care and rehabilitation to patients with FLBL

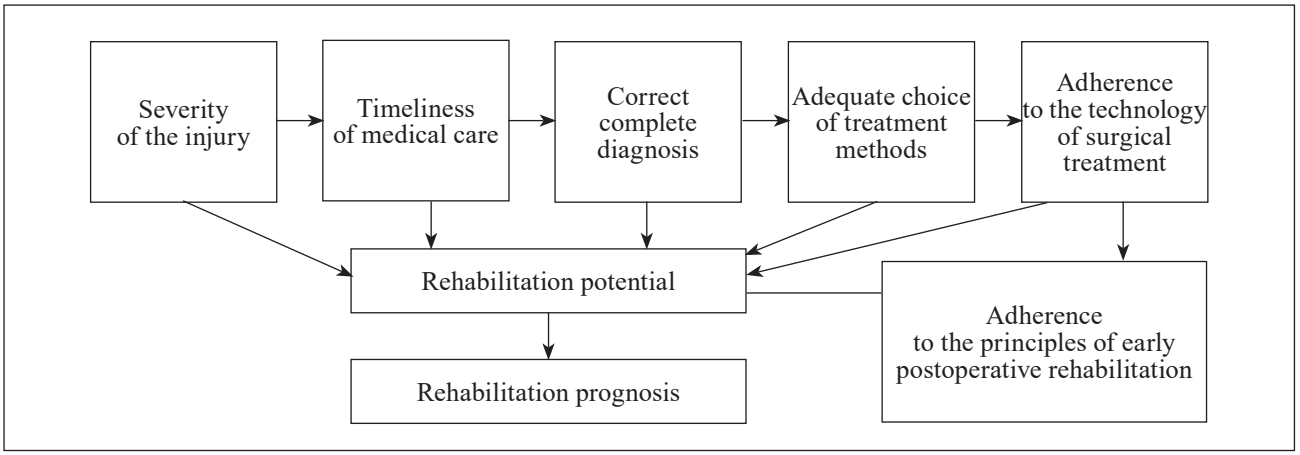

Fig. 2. The main factors affecting the quality of rehabilitation potential and rehabilitation prognosis

To assess the quality of RP, it should be divided into four types: high, moderate, low and absolutely low [20]. In our studies, the clinical and functional state of patients was analyzed in detail depending on the level of RP.

High rehabilitation potential was determined in 36.5 % of patients. At the same time, there were patients with uncomplicated fractures of long bones and mild traumatic brain injury (TBI). The patients did not develop life-threatening complications, there were no restrictions on self-care; specialized care included treatment of fractures. Clinical and functional prognoses were favorable or relatively favorable; the functional class was FC-0.

Moderate rehabilitation potential was established in 40 % of patients. There were multiple fractures (thigh + lower leg, upper limbs), traumatic shock stage I–II, mild TBI. The treatment was carried out for 2–3 weeks. Clinical and functional prognoses were favorable or relatively favorable, FC-0 or FC-1.

Low rehabilitation potential was observed in 21 % of patients, characterized by multiple fractures, moderate TBI, blood loss, fat embolism, damage to soft tissues of the trunk and limbs, traumatic shock

Table 3

Characteristics of rehabilitation groups of patients with FLBL

Clinical and functional characteristic	Rehabilitation group			
The severity of the injury, degree	I — mild	II — moderate	III — severe	IV — extremely severe, multiple injuries
Rehabilitation potential	High	High or moderate	Moderate or low	Low
Clinical and labor prognosis	Favorable	Favorable	Relatively favorable	Unfavorable
Goal (IRP)	Prevention of disability: full or partial restoration of impaired functions, full restoration of social and household activity and working capacity	Maximum restoration of impaired functions and work capacity, restoration of social and household activity	Reduction in the degree of movement disorders or working out substitute functional compensations, restoration of household activity, partial restoration of working capacity	Production of substitute compensations, restoration of self-care skills, use of residual working capacity

stage III–IV. Fractures were treated by immobilization and/or stable metallo-osteosynthesis. Clinical and functional prognoses were relatively unfavorable, FC-2 or FC-3.

Absolutely low rehabilitation potential (2.5 % of patients) is characterized by the presence of two or more traumatic zones of multiple bone fractures, traumatic amputations, severe TBI, injuries to bones and pelvic organs, injuries and ruptures of internal organs. The main goal is to restore the function of vital organs and systems, and the treatment of fractures in the first stage involves the use of conservative methods. The clinical and functional prognoses are unfavorable (FC-4).

It should be emphasized separately that RPr is the second important component for the creation of RP, which determines the possibilities of the rehabilitation potential and is the final result of the achieved goal of rehabilitation, namely: restoration of the function of the damaged organ, as well as social and labor adaptation.

Previously, we divided the rehabilitation prognosis into favorable, relatively favorable, relatively unfavorable, and absolutely unfavorable [21]:

– *favorable* is a complete (100 %) recovery of the functional capabilities of the injured limb and a complete (100%) recovery of social and labor adaptation. Functional class — FC-0;

– *relatively favorable* — the possibility of restoring or preserving function up to 75% or more (FC-1);

– *relatively unfavorable* — restoration of the function of the injured limb from 25 to 50% (FC-2);

– *absolutely unfavorable* — the possibility of restoring or preserving the function of the injured limb up to 25 % (FC-4).

Based on the analysis and generalization of scientific literature [13–15, 17, 19–22] and own research on treatment outcomes in 63 patients with FLBL, we have elaborated a working scheme of clinical and functional characteristics of individual rehabilitation groups.

To analyze and assess the severity of the injury, we tentatively identified four degrees of damage:

– I — patients with consequences of minor damage to segments of the limbs with moderate impairment of their functions, favorable functional class (FC-0), treated as outpatients. At the same time, a second subgroup of patients was identified, in which functional disorders were more severe due to light injuries of the bones of the limbs (bone fractures with minor displacements of the segments) (FC-1). Such patients needed treatment in a hospital;

– II — damage to the bones of the limbs of moderate severity (closed multifragmentary fractures) with minor complications in vascular and nerve formations or joint contractures and functional disorders (FC-2);

– III — significant damage at the level of both organ and body, with functional disorders of FC-3;

– IV — extremely severe injuries after a combined trauma of the locomotor system and other organs and systems. These functional disorders were defined as FC-4.

All clinical and functional characteristics are combined in the Table 3. During the assessment of the condition of patients with FLBL, we took into account the severity of the injury and the rehabilitation potential and formed four groups, which subsequently made it possible to determine their rehabilitation prognosis and IRP. To create a rehabilitation program, it is also important to select a homogeneous

group of patients (the so-called rehabilitation group, RG).

The first group of patients with injuries of mild degree of severity and high rehabilitation RP and RPr was divided into two subgroups: Subgroup 1 with the consequences of mild injuries with functional disorders from FC-0 to FC-1 and a high rehabilitation potential, Subgroup 2 — FC-1 and FC-2 , with a possible disability in the future. Rehabilitation assistance can be provided to patients of the first subgroup in day hospitals or polyclinics at their place of residence. Patients of the second subgroup require inpatient rehabilitation, conservative or surgical treatment, and later, at the end of the fourth month of hospital stay, they need to be referred to the MSEC to determine their clinical and functional status.

The second group included patients with moderate limb injuries, high RP and favorable RPr with FC-2 and FC-3. It was necessary to create an IRP for these patients to prevent disability. In high RP, their sick leave was extended for the purpose of rehabilitation in outpatient conditions and subsequent referral to the MSEC to resolve the issue of disability.

The third group comprised patients with significant damage both at the organ and body levels. In this case, attention was paid to determination of RP and RPr and, taking into account these factors, the period of rehabilitation was limited. If the RP was low, and the RPr was relatively unfavorable according to FC- 3, then after 3–4 months the patient was referred to the MSEC to determine the disability group.

The rehabilitation route for this group of patients consisted of a surgical inpatient and subsequent outpatient or inpatient treatment, and then referral to the MSEC for an IRP.

The fourth group consisted of patients with the consequences of extremely severe injuries after the combined trauma of the musculoskeletal system and other organs and systems, the final degree of insufficiency and lost functional and anatomical defects (FC-4). RP in such patients is extremely low, and RPr is absolutely unfavorable. The goal of rehabilitation in this case is to stabilize the consequences of the injury (FC-4) and prevent their progression, compensate for lost opportunities and expand the limits of social and household activity with the help of improvised means and devices. After completion of inpatient rehabilitation, these patients should be referred to the MSEC for determination of the 1st group of disability. They also require regular provision of special means to support vital activities. After establishing a disability, MSEC doctors draw up an IRP for the disabled, which includes medical, social and labor rehabilitation. Rehabilitation of these patients was mainly carried out in outpatient clinics.

In our studies, based on IPR of patients with FLBL, the results of rehabilitation were evaluated in 80 % of patients: 22 % of them received the possibility to move independently (FC-0 or FC-1); 54 % — to walk with crutches with a permissible load on the injured limb for a distance of 0.5–1 km (FC-2); 8.6 % — to move with the help of external support devices, «walking frames».

In 28% of patients, joint contractures and muscle hypotrophy decreased, muscle tone improved, and the range of motion in adjacent joints of the injured limb increased.

At the time of admission to the hospital, 24% of patients had limited life activities due to a decrease in the ability to self-care (characterized as FC-3 and FC-4). After treatment and rehabilitation on discharge from the hospital, this indicator was found in only 4.9% of patients.

Conclusions

The conducted studies showed that the proposed principles of creating a medical rehabilitation program for patients with fractures of the long bones of the limbs made it possible to more objectively substantiate the scope and terms of restorative treatment at all stages of rehabilitation and to specify in each case the structure of rehabilitation measures, which, in the end, made it possible to develop individual rehabilitation programs for these patients and improve the results of their treatment.

Conflict of interest. The authors declare no conflict of interest.

References

1. Loskutov, O., Zarutskiy, Y. (2016). The modern concept of diagnosis and treatment of gunshot and mine-explosive injuries of limbs. ORTHOPAEDICS, TRAUMATOLOGY and PROSTHETICS, 0(2), 5–9. doi:10.15674/0030-5987201625-9
2. Korol, S. O., Matviychuk, B. V. (2017). Modern aspects of providing surgical care to the injured with a gunshot fracture of the humerus. Clinical surgery, 3, 36–38. (in Ukrainian)
3. Korol, S. (2016). Analysis of surgical treatment of tibial fractures fractures during the antiterrorist operation. ORTHOPAEDICS, TRAUMATOLOGY and PROSTHETICS, 0(2), 10–14. doi:10.15674/0030-59872016210-14
4. 4. Combat injuries of limbs (n.d.). Retrieved from www.0zd.ru/.../boevye_povrezhde...onechnostej.htm.
5. Korol, S. O., Bespalenko, A. A. (2015). The use of modern methods of specialized trauma treatment of the wounded with gunshot fractures of long bones (IV level of medical care). Chronicle of Traumatology and Orthopedics, 1–2, 28–30. (in Ukrainian)
6. Laksha, A. M., Los, D. V. (2015). Treatment of victims with gunshot wounds of the soft tissues of the limbs. Annals of traumatology and orthopedics , 1–2, 31–33. (in Ukrainian)
7. Trutyak, I. R., Haida, I. M., Bohdan, I. S. (2016). Treatment

of complications of combat trauma of the musculoskeletal system in the military medical clinical center. Material of the XVII Congress of orthopedic traumatologists of Ukraine. (in Ukrainian)
8. Korol, S. O. (2016). Fire and mine-explosive injuries of the lower leg in the structure of combat trauma of the limbs during an anti-terrorist operation. Herald of marine medicine, 2, 215–219. (in Ukrainian)
9. 9. Compartment syndrome in gunshot wounds of the extremities. (n.d.). Retrieved from https://health-ua.com/article/42895-kompartmentsindrom-privognepalnih-poranennyah-kntcvok
10. Noreiko, S. B., Zenchenkov, I. P., Fedoryshyn, R. P. & et al (2014). Physical rehabilitation after femur, 4, 115–118.
11. Al Qur'an Jafar Taisir Mohammad (2018). Physical rehabilitation after intramedullary osteosynthesis in athletes with diaphyseal fractures of the tibia: abstract of the dissertation of the candidate of sciences in physical education and sports.
12. Physical rehabilitation of patients with tibia fractures (n.d.). Retrieved from https://naukam.triada.in.ua.
13. Korzh, M., Yaremenko, D., Shevchenko, O. (2011). Modern problems and prospects for the development of the organization of medical rehabilitation of patients with injuries and diseases of the musculoskeletal system, 4, 86–88. doi: 10.15674/0030-59872011486-88.
14. Klymovytskyi, V. G., Antonov, A. A., Grebeniuk, A. M (2009). Rehabilitation in the early postoperative period with intramedullary blocked hip osteosynthesis. Trauma, 10 (1), 79–81. (in Ukrainian)
15. Baryshok, T. V., Buchka, O. M. (2014). Physical rehabilitation of patients with bone fractures during the period of splinting. Bulletin of Zaporizhzhya National University, 1, 106–111. (in Ukrainian)
16. Nikanorov, O. K. (2006). Application of traditional and non-traditional methods of physical rehabilitation in patients with diaphyseal fractures of the femur and tibia: author's abstract of the candidate of sciences in physical education and sports. (in Ukrainian)
17. Yaremenko, D. A., Shevchenko, E. G. (2011). Current issues of the organization of medical rehabilitation of patients with trauma consequences and diseases of the musculoskeletal system. Annals of traumatology and orthopedics,1–2, 3–12. (in Ukrainian)
18. Korzh, M., Yaremenko, D., Goridova, L., & Romanenko, K. (2010). Mistakes and complications in orthopaedic-traumatological practice. ORTHOPAEDICS, TRAUMATOLOGY and PROSTHETICS, 0(2), 5. doi:10.15674/0030-5987201025-10
19. Tankut, V. O., Golubeva, I. V., Rykun, M. D. & et al (2021). Retrospective medical and social analysis of the treatment of patients with the consequences of fractures of long bones of the limbs. Orthopedics, traumatology and prosthetics, 1, 43–50. doi: 10.15674/0030-59872021143-50.
20. Smychek, V. B., Kazak, L. G., Rodionova, T. R. (2006). Organization of stages of medical rehabilitation of patients with the consequences of fractures of long bones of the limbs associated with craniocerebral trauma. Orthopedics, Traumatology and prosthetics, 2, 11–17. (in Ukrainian)
21. Nikitina, O. V. (2010). Physical rehabilitation in the early postoperative period after blocked intramedullary osteosynthesis of the hip. Problems of physical education and sport, 6, 79–84. (in Ukrainian)
22. Kudievskye, A., Golovakha, M., Shishka, I., Zabielin, I., & Zavdun, E. (2017). Role of surgical treatment methods in medical rehabilitation for patients with deceases and consequences of muscle-skeletal injuries. ORTHOPAEDICS, TRAUMATOLOGY and PROSTHETICS, 0(4), 90-95. doi:10.15674/0030-59872016490-95.

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CURRENT ISSUES IN THE FORMATION OF THE REHABILITATION SYSTEM FOR VICTIMS WITH FRACTURES OF THE LONG BONES OF THE LIMBS IN MARTIAL LAW CONDITIONS

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