INNOVATIVE APPROACH TO THE TREATMENT OF DEFECTS AND DEFORMITIES OF THE FACIAL SKELETON BONES

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Abstract. *The developed algorithm of the organization of the stomatologic help to patients with the combined injuryof bones of a facial skeleton consists of three blocks of the actions rendered in a reception, the medical and diagnostic actions and events held in the first 3 hours by experts. Also it is offered to establish algorithmic dependences of a condition of patients with last diseases of particular persons, in similar situations, for this purpose programs have to be archived and be stored on the server. If necessary the computer on a network in the automatic mode can send to this server inquiry on each patient. Then search regarding is carried out, whether this person at inspection participated in the same quality earlier, and all information will go on a network to the stomatologist's computer. The condition of the examined patients recorded in the abovenamed archives will be considered in an automatic order.*

Keywords. *Treatment and diagnostic algorithm, facial skeleton trauma, archival materials.*

ИННОВАЦИОННЫЙ ПОДХОД К ЛЕЧЕНИЮ ДЕФЕКТОВ И ДЕФОРМАЦИЙ КОСТЕЙ ЛИЦЕВОГО СКЕЛЕТА

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Аннотация. *Разработанный алгоритм организации стоматологической помощи пациентам с сочетанной травмой костей лицевого скелета включает три блока мероприятий: действия, выполняемые на этапе приёма пациента; лечебно-диагностические мероприятия; а также комплекс мероприятий, проводимых специалистами в первые 3 часа с момента поступления. Кроме того, предлагается формирование алгоритмических зависимостей состояния пациентов с аналогичными заболеваниями и повреждениями в сходных клинических ситуациях. С этой целью программные данные должны архивироваться и храниться на сервере. При необходимости компьютер, подключённый к сети, может в автоматическом режиме направлять запрос на сервер по каждому пациенту. Далее осуществляется поиск информации о том, участвовал ли данный пациент ранее в обследовании в аналогичном клиническом статусе, после чего вся соответствующая информация передаётся по сети на компьютер врача-стоматолога. Состояние обследуемых пациентов, зафиксированное в указанных архивах, будет анализироваться в автоматическом режиме.*

Ключевые слова: *лечебно-диагностический алгоритм, травма лицевого скелета, архивные материалы.*

YUZ SKELETI SUYAKLARI NUQSONLARI VA DEFORMATSIYALARINI DAVOLASHGA INNOVATSION YONDASHUV

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Annotatsiya.*Yuz skeleti suyaklarining qo‘shma jarohatlari bo‘lgan bemorlarga stomatologik yordam ko‘rsatishni tashkil etish bo‘yicha ishlab chiqilgan algoritm uchta asosiy blokdan iborat: bemorni qabul qilish bosqichida bajariladigan chora-tadbirlar; davolash va diagnostika tadbirlari; shuningdek, mutaxassislar tomonidan dastlabki 3 soat ichida amalga oshiriladigan kompleks choralar. Shuningdek, o‘xshash klinik holatlarda kuzatilgan bemorlarning ahvoli bo‘yicha algoritmik bog‘liqliklarni shakllantirish taklif etiladi. Buning uchun dasturiy ma’lumotlar arxivlanishi va serverda saqlanishi lozim. Zarurat tug‘ilganda, tarmoqqa ulangan kompyuter har bir bemor bo‘yicha serverga avtomatik tarzda so‘rov yuborishi mumkin. Shundan so‘ng mazkur bemor ilgari shunga o‘xshash klinik holatda tekshiruvdan o‘tgan-o‘tmaganligi aniqlanadi va barcha tegishli ma’lumotlar tarmoq orqali stomatolog shifokor kompyuteriga uzatiladi. Yuqorida qayd etilgan arxivlarda saqlangan bemorlar holati avtomatik tartibda tahlil qilinadi.*

Kalit so‘zlar: *davolash-diagnostik algoritm, yuz skeleti jarohati, arxiv materiallari.*

Introduction: Over the past decades, the structure of traumatic injuries worldwide has been changing, with an increasing incidence of severe polytrauma. This is manifested by more complex simultaneous injuries involving three, four, or more anatomical regions, creating significant difficulties in de-

termining the sequence of medical interventions and the therapeutic strategy for patients with combined maxillofacial skeletal injuries (CMFSI). The specific features of post-traumatic shock and the development of traumatic disease complicate the diagnostic process in such patients and necessitate the search for innovative treatment methods as well as the scientifically substantiated development of medical algorithm.

The present research was conducted within the framework of tasks outlined in the Decree of the President of the Republic of Uzbekistan *"On Measures for the Further Deepening of Healthcare System Reforms"*, particularly aimed at ensuring broad access to high-quality medical care that meets contemporary requirements and international standards. In this regard, the scientifically grounded development of algorithms for innovative methods of treating patients with CMFSI is of significant importance.

The conceptual foundations of medical algorithmization, which define the possibilities for solving further clinical problems, were established in the early 21st century in the works of numerous scholars [2, 3, 5, 11]. Research in this field continues in recent years [4, 8, 10]. However, the majority of such studies have focused on the creation of highly typified algorithms, often saturated with methodological shortcomings. Therefore, such approaches to medical assistance in CMFSI treatment cannot yield substantial or effective results. Many unresolved issues in this area prevent the full integration of dental treatment algorithms into other varieties of dental practice and instrumentation.

At present, many questions concerning the algorithmization of dental practice remain open. A wide range of previously proposed solutions can be modernized, as they are undoubtedly useful and should serve as foundational elements. In particular, for the effective implementation of algorithmization in CMFSI treatment, it is necessary to refine the concept and supplement it with innovative aspects reflecting the current state of science, to theoretically substantiate the feasibility and establish the practical necessity of algorithmization, to develop a methodology for creating dental treatment algorithms, to determine changes in therapeutic and rehabilitative activities associated with algorithmization, and to resolve additional specific issues in this field.

In dental research, leading scholars have recognized the demand for information and communication technologies to ensure reliable collection, transmission, analysis, and evaluation of diagnostic and therapeutic data for patients with CMFSI. Comprehensive measures undertaken by the Government of the Republic of Uzbekistan for the development of automated healthcare management systems and the creation of an integrated information environment are also directed toward the broad introduction of medical algorithmization, electronic documentation systems, and databases based on modern information and communication technologies. In this context, the development of innovative methods for processing informational resources in dentistry, aimed at improving the quality of medical data and enabling effective treatment of patients with minimal financial and temporal expenditures, represents both a highly relevant and unresolved theoretical and applied problem of great socio-economic and public significance. All these factors determine the urgency of scientific research in the field of dental algorithmization.

The aim of the research is to improve treatment methods for patients with combined maxillofacial skeletal injuries (CMFSI) through the development of a scientific concept of dental algorithmization, modernization of certain theoretical provisions, and the resolution of a range of problems in this field in accordance with the current level of scientific advancement.

The methodological foundation of the study is based on tested contemporary methods of scientific inquiry, with a predominant role given to materialist dialectics. The most widely applied methods included modeling, induction, deduction, analogy, synthesis, comparison, object-oriented programming, and a broad spectrum of statistical approaches to analysis.

Research methods.

The methodological framework of the study is aligned with the implementation of the Laws of the Republic of Uzbekistan *"On Healthcare"*, *"On Informatization"*, *"On Electronic Document Management"*, as well as the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 126 of 04.05.2011 *"On Measures for the Introduction and Use of an Electronic Document Management System in State and Economic Administration Bodies"*. Furthermore, the research corresponds with the priority directions of the national scientific and technological development program GNTP-9 *"Development of New Technologies for the Prevention, Diagnosis, Treatment, and Rehabilitation of Human Diseases"*.

Results. The algorithmization of dental practice should be understood as a set of interdependent and situation-specific organizational actions, as well as their complexes, structured on the principles of effective treatment methods for patients with combined maxillofacial skeletal injuries (CMFSI). Algorithmization in dentistry represents the development of treatment algorithms for practitioners, or more broadly, an approach to the examination and management of CMFSI patients. This approach is based on the automatic provision of optimal, situation-dependent solutions to the majority of diagnostic and therapeutic tasks faced by the dentist.

Within this framework, a comprehensive set of algorithmically defined actions and recommendations has been established, which must be implemented in the process of patient examination and treatment. A key feature of algorithmization in dental practice has been substantiated—namely, the capacity of the algorithm to operate in an automated manner depending on the patient's condition.

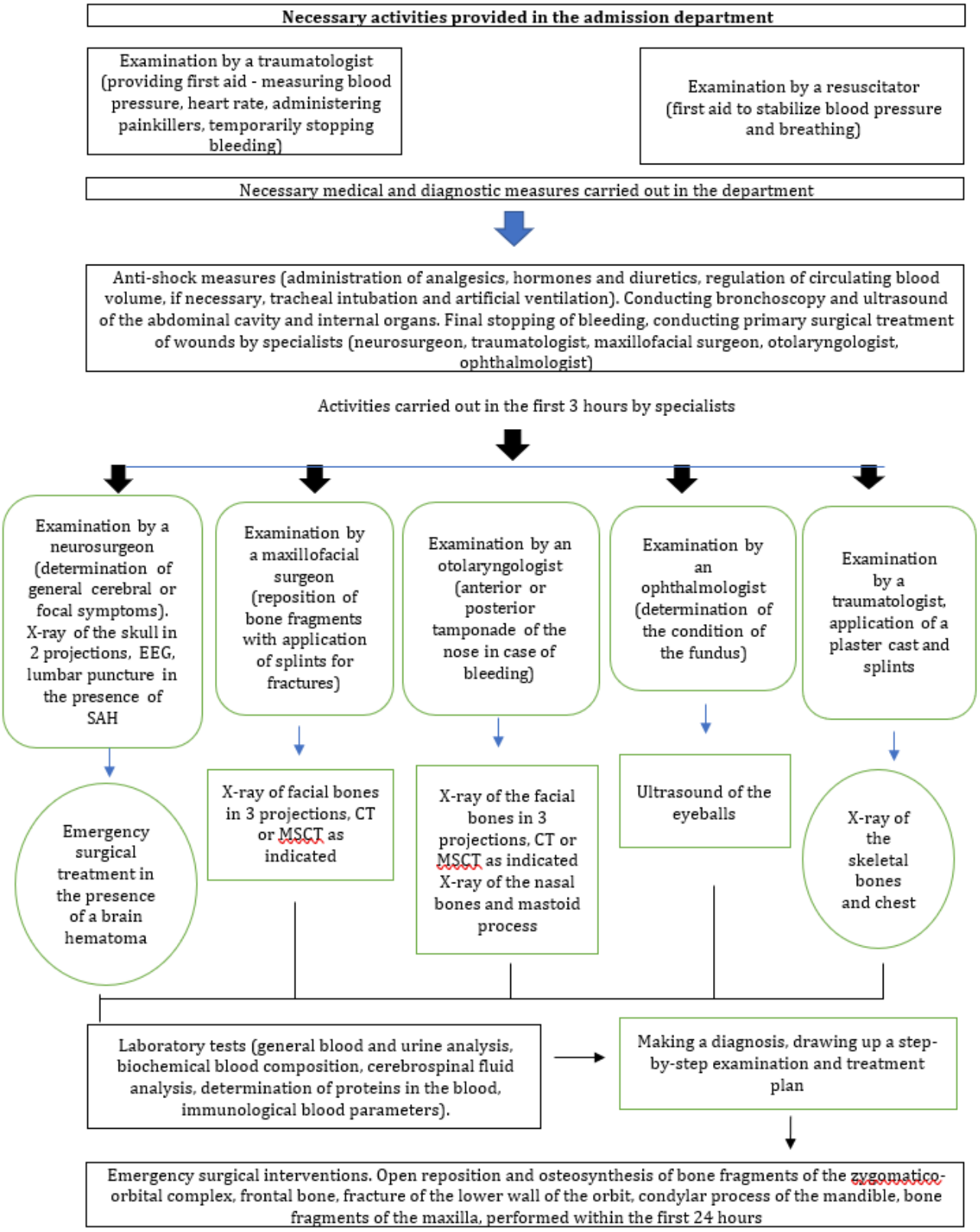


Fig. 1. **Algorithm of medical care for patients with STCLS**

The developed method for implementing such dependency is based on the dentist's input of etiological data into a computer system, obtained through the diagnostic process. The program then excludes contradictory information and automatically provides the dentist with recommendations directly linked to the submitted data.

Optimization of dental practice algorithms has been achieved by means of the automated arrangement of algorithmic actions in varying se-

quences of therapeutic processes, according to established priorities. A system of prioritization factors has been developed, which includes legal and ethical requirements, as well as the duration of treatment procedures. General theoretical principles of dental algorithmization are presented according to the criteria that rational algorithms must satisfy: specificity and detail, linguistic accuracy, simplicity, and unambiguity. Such algorithms must be understandable to every user. Furthermore, their complexity can be individualized through automated adjustments depending on the dentist's level of professional training.

We have established the core requirements for the development of computer programs and the necessity of approving these programs on the basis of dental practice algorithms. This approach allows, in particular, the optimization of patient examinations within minimal timeframes.

The proposed algorithm for organizing dental care in patients with combined maxillofacial skeletal injuries consists of three blocks: measures performed in the admission department, diagnostic and therapeutic interventions, and actions carried out by specialists within the first three hours (see Fig. 1). Additionally, it is proposed to establish algorithmic correlations between patient states and prior medical histories of specific individuals in similar clinical scenarios. For this purpose, programs must be archived and stored on a central server. When necessary, the computer can automatically send a query to this server for each patient. The system then identifies whether the individual has previously undergone examination in a comparable context and, if so, transmits the relevant data to the dentist's workstation. Thus, the recorded conditions of patients stored in archives are automatically taken into account during treatment.

This framework makes it possible to utilize highly analogous prior experiences — data on subjects whose clinical characteristics are most similar to the current patient. A number of issues concerning the use of such analogous cases have been addressed, including the automatic determination of the optimal sequence of tactical interventions based on prioritization. Furthermore, options for correlating tactical approaches have been proposed to establish their relative significance in prioritization.

Conclusions. The electronic storage of each patient's diagnostic program as an archived file provides the opportunity to verify the accuracy of the dentist's actions. This may prove useful when referring patients for additional diagnostic procedures and optimizing rehabilitative treatment. The proposed method of integrating new clinical data into dental practice algorithms enables the automatic initiation of supplementary examinations, their evaluation at any time, and the incorporation of algorithmically structured questions throughout the process. Moreover, optimal strategies can be applied in situations where newly entered information contradicts previously stored data within the system. These innovative methods of algorithm implementation, developed on the basis of computer technologies, provide dentists with effective solutions for a wide range of challenges, including the organization of algorithmic processes through the use of audio capabilities and the Internet.

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