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# APPROACHES TO OUTPATIENT MANAGEMENT OF PATIENTS WITH HEART FAILURE: FUNCTIONS AND TASKS OF A NURSE

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*Aim.* To analyze modern models of outpatient monitoring for patients with chronic heart failure and to define the functions and responsibilities of nurses in a heart failure clinic, using the example of the Chronic heart failure unit at the The Heart Center of the University Medical Center Corporate Foundation.

*Materials and method*s. This study is based on the practical experience of managing patients in the chronic heart failure clinic, which has been operating since 2014. Retrospective data from 2022 – 2024 were used, including quantitative indicators, frequency of decompensations, therapy adherence, and participation in postoperative follow-up.

*Results and discussion*. From 2022 to 2024, more than 4,000 patients were consulted. The number of patients who achieved optimal pharmacotherapy was 765 in 2022, 1,153 in 2023, and 1,107 in the first 9 months of 2024. The implementation of remote monitoring and nurse-led self-management significantly reduced hospitalization rates and improved patient awareness. Key nursing responsibilities include monitoring, education, psychological support, and coordination of interdisciplinary care.

*Conclusion.* Outpatient management of patients with chronic heart failure requires an interdisciplinary approach, with nurses playing a central role. The effectiveness of care increases through the integration of digital technologies, educational programs, and personalized care pathways.

*Key words:* chronic heart failure; outpatient monitoring; nursing care; telemedicine; treatment adherence; interdisciplinary approach

## INTRODUCTION

Chronic heart failure (CHF) remains one of the leading causes of hospitalization and disability among the adult population. Current clinical guidelines emphasize the importance of not only drug treatment, but also high-quality outpatient monitoring based on interdisciplinary interaction. Nurses of the Heart Center of the University Medical Center Corporate Foundation (UMC Heart Center) perform the following key tasks: comprehensive examination and selection of individual therapy, as well as constant monitoring of the condition of patients, which improves the quality of life of patients, reduces the level of hospitalizations and improves the prognosis for people with CHF and atherosclerosis, providing access to qualified medical care at all stages of the disease. The purpose of this report is to show the experience of nurses of the UMC Heart Center in complex nursing care, which significantly increases patients' adherence to treatment and improves their quality of life. Formation of specialized offices for CHF allows to increase the efficiency of observation and reduce the frequency of hospitalizations due to timely detection of signs of decompensation. In this context, the nurse becomes not just an executor of medical orders, but an active participant in the treatment process. The relevance of this topic is due to the need to systematize the tasks of the nursing service and increase the efficiency of its work in outpatient settings.

## MATERIALS AND METHODS

***Study Type.*** This work is a descriptive retrospective analysis of the experience of outpatient care of patients with chronic heart failure (CHF) based on the CHF room of the UMC Heart Center (Astana city, Republic of Kazakhstan). This article is a review work with elements of practical analysis, where the main focus is on the description of the organizational model of nursing care and the dynamics of monitoring patients with CHF, as well as the introduction of digital technologies and approaches to monitoring. The study covers the period from January 2022 to September 2024 and is based on primary medical documentation, internal reporting and clinical observations of patients who underwent outpatient treatment as part of the CHF management program.

***Selection of participants.*** The study included patients who were under observation in the CHF office

during the specified years, with an established diagnosis of chronic heart failure of I – IV functional class according to the NYHA classification, regardless of etiology.

***Inclusion criteria:***

• age over 18 years;

• confirmed diagnosis of CHF based on echocardiography data and clinical picture;

• regular monitoring in the CHF office for at least 6 months;

• consent to participate in the dynamic outpatient monitoring program and self-monitoring training.

***Exclusion criteria:***

• acute conditions (myocardial infarction, unstable angina) at the time of inclusion;

• cognitive impairment that interferes with learning;

• terminal cancer;

• lack of contact with the patient.

***Methodology for conducting observations and measurements.*** The nurse working in the CHF office performed:

• initial and repeated assessment of the patients' condition, including measurement of blood pressure, heart rate, oxygen saturation, body weight, and identification of signs of decompensation (shortness of breath, edema, tachycardia, decreased exercise tolerance);

• collection of anamnestic data and assessment of treatment adherence;

• teaching patients self-monitoring techniques (keeping a diary of symptoms, weight, blood pressure and medication intake);

• counseling on lifestyle modification (diet, quitting bad habits, physical activity regimen).

For patients at the postoperative stage (VAD implantation, heart transplantation), in-depth monitoring was carried out using telemedicine platforms, including the transfer of data on the patient's condition via mobile applications and remote consultations.

***Data processing.*** Quantitative data on the number of visits, distribution of patients by stages of CHF, achievement of drug therapy goals, referrals for hospitalization and postoperative observation were systematized and presented in the form of tables. The data were analyzed dynamically by year (2022, 2023, 9 months of 2024). Data processing was carried out using Microsoft Excel. Calculations included: frequency analysis, percentages, average values. The results are presented as numbers and percentages. Statistical hypothesis testing methods were not used, since the purpose of the article is a descriptive assessment of the organizational model and its results.

***Ethical aspects.*** The study was conducted in accordance with the ethical standards of the Helsinki Declaration (1964, and subsequent revisions). The publication does not indicate the names, initials or other identifying data of patients. Before the start of the dispensary observation, patients signed informed consent to participate in the program and to the use of their data for scientific and educational purposes. Ethical approval for the description of this experiment was obtained from the internal expert council of the UMC Foundation.

## RESULTS

In the period from January 2022 to September 2024, patients with an established diagnosis of CHF I-IV functional class according to the NYHA classification underwent outpatient observation in the CHF office of the UMC Heart Center. The dynamics of the office's performance indicators reflect an increase in the number of patients sought, an expansion of the scope of services provided and an active role of nursing staff in ensuring patient care.

In 2022, 1,418 patients were under outpatient observation, in 2023 – 1,604 patients, over 9 months of 2024 – 1,340 patients, which indicates a trend towards an increase in the number of patients and, probably, an increase in the detection of CHF.

Analysis of the indicator of achieving optimal drug therapy shows positive dynamics: in 2022, optimal therapy was achieved in 765 patients; in 2023 – In 1,153 patients; for 9 months of 2024 – In 1107 patients.

Patients observed in the office were also referred for hospitalization and high-tech medical care (HTMC). In particular, the following types of interventions were performed during the reporting period: left ventricular assist device (VAD) implantation, transcatheter aortic valve implantation (TAVI), valve replacement, electrophysiological study, radiofrequency ablation, coronary angiography, endomyocardial biopsy.

The preoperative stage included an initial introductory conversation conducted by a nurse. This conversation concerned the nature of the upcoming intervention, possible risks and stages of postoperative care, which helped to reduce patient anxiety, build trust and a higher level of awareness. The etiological structure of CHF in the observed cohort is represented mainly by the following forms: ischemic cardiomyopathy, mixed cardiomyopathy, hypertensive cardiomyopathy, and to a lesser extent, dilated cardiomyopathy and congenital heart defects.

The nurse is delegated the following key tasks during the observation stage: primary monitoring of condition parameters (blood pressure, heart rate, $SpO_2$, body weight); identification of signs of decompensation; dynamic observation; correction of drug therapy under the supervision of a physician; teaching patients self-monitoring skills; organization of telemedicine observation, especially for patients from remote regions.

Additionally, up-to-date records of patients with terminal CHF are maintained, including at the stage of preparation for transplantation or implantation of circulatory assist devices. As part of the state program for the development of outpatient care, a CHF roadmap has been organized in Kazakhstan since 2021, according to which CHF offices have been opened in each region and in most clinics. As of September 2024, there are more than 300 specialized CHF offices in the country, where cardiologists, general practitioners and nursing specialists work.

Table 1 presents the quantitative indicators of the CHF office performance for 2022, 2023 and 9 months of 2024, including the number of initial and repeat visits, CHF stages at the time of referral and the level of achieved drug therapy. The data confirm an increase in patient coverage,

Table 1. Analysis of the performance indicators of the Chronic Insufficiency Cabinet for 2022-2024

| Section | Indicator | 2022 | 2023 | 2024 (9 months) |
|---|---|---|---|---|
| General information | Total number of patients in the CHF office | 1418 | 1604 | 1340 |
| | Primary patients | 645 | 1064 | 831 |
| Stages of CHF | Stage D | 636 | 393 | 238 |
| | Stage C | 732 | 1187 | 1035 |
| | Stage B | 50 | 25 | 67 |
| Follow-up visits and reatments | Return visit | 406 | 540 | 509 |
| | Optimal drug therapy | 765 | 1153 | 1077 |
| | Hospitalization has been scheduled | 375 | 451 | 323 |
| Interventions | LVAD implantation | 4 | 5 | 18 |
| | Valve replacement | 17 | 34 | 15 |
| | Arrhythmology procedures (ICD, CRT-D) | 122 | 176 | 60 |
| | Interventional procedures (EFI RFA) | 25 | 13 | 27 |
| | Coronary angiography | 64 | 86 | 54 |
| | Aorto-coronary bypass surgery | 25 | 23 | 3 |
| Cardiomyopathies and diagnoses | Ischemic cardiomyopathy | 414 | 450 | 430 |
| | Mixed cardiomyopathy | 405 | 399 | 375 |
| | Hypertensive cardiomyopathy | 308 | 401 | 386 |
| | Dilated cardiomyopathy | 130 | 150 | 84 |
| | Congenital heart defect | 24 | 37 | 34 |
| | Idiopathic pulmonary hypertension / CTEPH | 23 | 17 | 20 |
| | Hypertrophic cardiomyopathy | 14 | 20 | 14 |
| | Peripartum cardiomyopathy | 13 | 30 | 11 |
| | Thyrotoxic cardiomyopathy | 12 | 12 | 8 |
| | Pericarditis / myocarditis | 2 | 2 | 8 |
| | Drug-induced (toxic) cardiomyopathy | 4 | 4 | 3 |
| | Acquired heart defect | 22 | 34 | 32 |
| | Arrhythmogenic cardiomyopathy | 2 | 4 | 11 |
| | Restrictive cardiomyopathy | 4 | 1 | 7 |
| | Chronic pulmonary heart disease | 1 | 2 | |

increased treatment adherence and increased efficiency of outpatient monitoring carried out by a multidisciplinary team with a leading role of a nurse.

## DISCUSSION

The presented results emphasize the importance of a systemic outpatient approach to the management of patients with CHF and demonstrate the effectiveness of the specialized office based at the UMC Heart Center. The data obtained indicate positive dynamics both in the number of patients observed and in achieving optimal therapeutic goals, which is one of the key indicators of the quality of outpatient care.

The main findings of this analysis are in line with current international trends and confirm the role of the nurse as an active participant in the interdisciplinary team. In particular, interventions aimed at patient education, symptom management, lifestyle modification and medication adherence contribute to the development of a sustainable model of disease self-management. These findings are consistent with the data of the study by Lambrinou et al. [5], according to which regular communication between patients and the nurse through telephone consultations improves treatment adherence and maintains a stable quality of life.

Non-drug measures implemented by nursing staff, such as weight control, salt and fluid restriction, cessation of bad habits and sleep patterns, play an important role in preventing decompensation. The use of telemedicine technologies enhances the effect of continuous monitoring, especially in conditions of limited access to highly specialized care in the regions. The

experience of the UMC Clinical Foundation demonstrates the successful integration of digital solutions into clinical practice, which is in line with current ESC and ACC/AHA recommendations, emphasizing the importance of remote monitoring in reducing hospitalizations and increasing the effectiveness of monitoring.

The practice of early preoperative support of patients with end-stage CHF referred for heart transplantation or implantation of assistive devices deserves special attention. The participation of a nurse in counseling, preparing and educating the patient at this stage not only reduces anxiety, but also improves the quality of preparation for the intervention, and optimizes the use of the medical team's resources. Despite the positive results, the limitations of this observation should be noted. Firstly, the descriptive retrospective methodology does not allow establishing cause-and-effect relationships. Secondly, the study did not analyze outcomes in individual patient cohorts, which limits the ability to assess the effectiveness of specific interventions. In addition, the level of adherence and the degree of patient involvement in the self-monitoring process were not quantitatively assessed.

The presented experience can serve as a model for scaling up similar practices at the level of the entire healthcare system. The development of the nursing component, staff training, expansion of patient education programs and digital solutions are logical directions for further improvement of outpatient management of CHF in Kazakhstan.

***International experience in optimizing outpatient treatment of heart failure. Multidisciplinary care programs: the example of Sweden and the UK.*** The effectiveness of outpatient management of patients with CHF has been confirmed by international programs in which a multidisciplinary approach with the active participation of specialized nursing staff plays a key role. One of the striking examples is SwedeHF (Swedish Heart Failure Registry) – a national heart failure registry in Sweden. On its basis, personalized monitoring programs have been developed, including teamwork of a physician, cardiac nurse and clinical pharmacologist. Each outpatient visit in such programs includes a comprehensive assessment of the patient's condition, adjustment of therapy and training in self-monitoring principles. In the UK, the Heart Failure Nurse Specialists model is widely used, within the framework of which specially trained nurses manage patients with CHF at the outpatient level. These specialists monitor symptoms, adjust treatment, conduct educational work with patients and ensure communication between different levels of medical care. According to national reports, such programs contribute to a significant reduction in the number of rehospitalizations, increased adherence to therapy, and overall patient satisfaction with treatment. The implementation of similar models in Kazakhstan, including the creation of CHF rooms with the active participation of nurses, is consistent with these international approaches and has proven its effectiveness at the national level.

## CONCLUSIONS

Outpatient treatment of CHF is a key element in disease control and prevention of its exacerbations. The participation of a nurse ensures continuity of observation, compliance with medical orders and constant communication with the patient.

Much attention is paid to teaching patients the basics of self-management: recognizing exacerbation symptoms, proper nutrition, physical activity and adherence to medication. As described in foreign sources, regular monitoring gave patients the opportunity to maintain contact with a specialist nurse, ask questions and receive support on self-management issues in heart failure. The current study showed that regular communication and support (even by telephone) are important for people with heart failure. Improving self-management and maintaining quality of life was possible thanks to constant feedback [5]. Thus, regular telephone consultations conducted by nurses contribute to the formation of a responsible attitude to treatment in the patient and increase adherence to therapy. The nurse also plays a key role in the interdisciplinary team, coordinating the interaction between cardiologists, cardiac surgeons, arrhythmologists, nephrologists, nutritionists and psychotherapists. It is nursing observation that most often allows timely detection of changes in the patient's condition and informing the doctor about them for timely treatment correction. Nursing support reduces patient anxiety, helps to adapt to life with the disease, improves the quality of life, reducing the number of hospitalizations.

Thus, a nurse is not just an executor of medical orders, but an active participant in the treatment process, a care coordinator and a mentor for the patient. Without the participation of nursing staff, it is impossible to ensure effective outpatient management of CHF and achieve sustainable positive treatment results.

***Authors' contribution:***

A. Kushugulova, M. Bekbossynova, A. Sailybaeva – concept and design of research.

S. Jetybayeva – collection and preparation of data.

A. Zholdybayeva, A. Taukelova – statistical analysis.

A. Zholdybayeva, M. Isupova – writing

Zh. Duisenbina – editing.

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**TRANSLITERATION**

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## ПОДХОДЫ К АМБУЛАТОРНОМУ ВЕДЕНИЮ БОЛЬНЫХ С ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТЬЮ: ФУНКЦИИ И ЗАДАЧИ МЕДИЦИНСКОЙ СЕСТРЫ

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*Цель*. Анализ современных моделей амбулаторного наблюдения за пациентами с хронической сердечной недостаточностью и определение функций и задач медицинской сестры в условиях кабинета хронической сердечной недостаточности на примере Центра сердца Корпоративного Фонда UMC.

*Материалы и методы*. Работа основана на анализе практического опыта ведения пациентов в кабинете хронической сердечной недостаточности, функционирующем с 2014 г. В работе использованы ретроспективные данные мониторинга пациентов за 2022 – 2024 гг., включая количественные показатели, частоту декомпенсаций, приверженность терапии и участие в послеоперационном наблюдении.

*Результаты и обсуждение*. За 2022 –2 024 гг. было консультировано более 4 000 пациентов. Доля пациентов, достигших оптимальной медикаментозной терапии, составила 765 в 2022 г., 1153 – в 2023 г., 1107 – за 9 месяцев 2024 г. Внедрение дистанционного мониторинга и сестринского самоконтроля позволило снизить частоту госпитализаций и повысить уровень осведомленности пациентов. Основные функции медсестры включают в себя мониторинг, обучение, психологическую поддержку и координацию междисциплинарного взаимодействия.

*Выводы*. Амбулаторное ведение пациентов с ХСН требует междисциплинарного подхода, в котором ключевую роль играет медицинская сестра. Эффективность наблюдения возрастает за счет интеграции цифровых технологий, образовательных программ и персонализированного маршрута ухода.

*Ключевые слова*: хроническая сердечная недостаточность; амбулаторное наблюдение; сестринский уход; телемедицина; приверженность лечению; междисциплинарный подход

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**ЖҮРЕК ЖЕТКІЛІКСІЗДІГІ БАР НАУҚАСТАРДЫ АМБУЛАТОРЛЫҚ ЕМДЕУ ТӘСІЛДЕРІ: CHF КАБИНЕТІНДЕГІ МЕДБИКЕНІҢ ФУНКЦИЯЛАРЫ МЕН МІНДЕТТЕРІ**

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*Зерттеудің мақсаты.* СЖЖ бар пациенттерді амбулаториялық бақылаудың заманауи үлгілерін талдау және UMC корпоративтік қорының Жүрек орталығы мысалында СЖЖ кабинетінде мейіргердің функциялары мен міндеттерін анықтау.

*Материалдар және әдістер.* Бұл жұмыс 2014 жылдан бері жұмыс істеп келе жатқан СЖЖ кабинетінде пациенттерді жүргізу тәжірибесін талдауға негізделген. Зерттеуде 2022–2024 жылдар аралығындағы науқастардың мониторингінің ретроспективті деректері, оның ішінде сандық көрсеткіштер, декомпенсация жиілігі, емге бейілділік және операциядан кейінгі бақылауға қатысу қамтылған.

*Нәтижелер және талқылау.* 2022 – 2024 жылдар аралығында 4000-нан астам пациентке кеңес берілді. Оптималды медикаментозды терапияға қол жеткізген пациенттердің саны: 2022 жылы – 765, 2023 жылы – 1153, ал 2024 жылдың 9 айында – 1107 болды. Қашықтықтан бақылау және мейіргерлік өзін-өзі бақылауды енгізу ауруханаға жатқызу жиілігін азайтып, пациенттердің хабардарлығын арттыруға мүмкіндік берді. Мейіргердің негізгі функцияларына мониторинг, оқыту, психологиялық қолдау және пәнаралық өзара әрекеттестікті үйлестіру кіреді.

*Қорытынды.* СЖЖ бар пациенттерді амбулаториялық жүргізу пәнаралық тәсілді қажет етеді, мұнда мейіргер маңызды рөл атқарады. Бақылаудың тиімділігі цифрлық технологияларды, білім беру бағдарламаларын және дербестендірілген күтім маршруттарын интеграциялау арқылы артады.

*Кілт сөздер:* созылмалы жүрек жеткіліксіздігін басқаруда амбулаторлық бақылау; тиімді мейірбикелік күтім; телемедицина арқылы қашықтан мониторинг; науқастардың емге адалдық деңгейін арттыру және көпсалалы тәсіл маңызды рөл атқарады