

Received: 02 May 2024 / Accepted: 19 August 2024 / Published online: 30 August 2024

DOI 10.34689/SH.2024.26.4.006

UDC 616.127-004-036-08



## ASSESSMENT OF FEASIBILITY OF DYSLIPIDEMIA CLINICS AND IMPLEMENTATION ATHEROSCLEROSIS PROJECT IN KAZAKHSTAN

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### Abstract

**Introduction.** Established in 2021, the Lipid Clinic Network of Kazakhstan is dedicated to creating a global framework for consistent standards in diagnosing, managing, and treating lipid disorders, guided by the European Society of Cardiology and European Atherosclerosis Society (further - ESC/EAS) Guidelines on dyslipidaemia management.

**The aim** is to evaluate pillars for LCN in Kazakhstan and assess the feasibility of dyslipidemia clinics and implementation atherosclerosis project in Kazakhstan.

**Materials and methods.** This is a cross-sectional survey with 8 questions to explore the organization of a lipid clinic network in Kazakhstan. 28 clinics took part and respondents were anonymous. The questionnaire was based on EAS LCN evaluation.

**Results.** 54 % of dyslipidemia clinics are located in outpatient department and 11% of clinics are located as a sub-department within a cardiology department or similar in the hospital. 71% of clinics (20) show connections to hospital departments including diabetes, endocrinology and rare disease units. The staff composition of LCN Kazakhstan is: physicians - 26, nurses - 20, geneticist expert in dyslipidemias<sup>1</sup> - 1, dietitian – 4, nutritionist - 0.

A majority of clinics (53.60%) are situated in outpatient departments, highlighting a prevalent reliance on outpatient care for lipid-related services. The physician and nurse staffing levels align with LCN-EAS standards, the lack of nutritionists, geneticists, and dietitians represents a significant gap in the multidisciplinary care model advocated by the EAS. Capacity to provide therapeutic education on lifestyle changes, cardiovascular disease (CVD) prevention, and adherence to treatment is present in 16 clinics.

**Conclusion.** Some criteria of LCN Kazakhstan are aligned with EAS LCN requirements in terms of data management, location, facility and the, management of the interaction with the patients. However, composition of staff, clinical trial management and connection within the health service infrastructure and patient referral need to be enhanced.

**Keywords:** Lipid clinic Network, atherosclerosis, dyslipidemia, feasibility study.

### Резюме

## ОЦЕНКА ЦЕЛЕСООБРАЗНОСТИ СОЗДАНИЯ КЛИНИК ПО БОРЬБЕ С ДИСЛИПИДЕМИЕЙ И РЕАЛИЗАЦИИ ПРОЕКТА ПО БОРЬБЕ С АТЕРОСКЛЕРОЗОМ В КАЗАХСТАНЕ

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**Введение:** Липидная Клиническая Сеть (далее – ЛКС) Казахстана, созданная в 2021 году, посвящена созданию глобальной структуры для стандартизированного подхода к диагностике, управлению и лечению липидных нарушений, руководствуясь рекомендациями Европейского общества кардиологии и Европейского общества атеросклероза (далее – ЕОК/ЕОА) по управлению дислипидемией.

**Цель.** Оценка основных направлений Липидной клинической сети Казахстана и оценка осуществимости работы клиник по лечению дислипидемий и реализации проекта по атеросклерозу в Казахстане.

**Материалы и методы:** Исследование было выполнено методом поперечного опроса, состоящего из 8 вопросов, направленных на изучение организации сети липидных клиник в Казахстане. В исследовании приняли участие 28 клиник, респонденты опроса были анонимными. Анкета была разработана на основе оценки ЛКС Европейского общества атеросклероза.

**Результаты:** 54% клиник дислипидемии расположены в амбулаторных отделениях, и 11% клиник функционируют в качестве подотделов в кардиологических отделениях или аналогичных подразделениях больницы. 71% клиник (20) демонстрируют связь с больничными отделениями, такими как диабетология, эндокринология и отделения редких заболеваний. Согласно результатам опроса, персонал ЛКС Казахстана распределен следующим образом: врачи – 26, медсестры – 20, специалист по генетике дислипидемий – 1, диетолог – 4, нутриционистов нет.

Значительное большинство клиник (53,60%) расположено в амбулаторных отделениях, что подчеркивает зависимость от амбулаторной помощи в предоставлении липидных услуг. Количество врачей и медсестер соответствует стандартам ЛКС-ЕОА, однако нехватка нутриционистов, генетиков и диетологов представляет значительный пробел в многопрофильной модели ухода, рекомендованной ЕОА. Возможность предоставить терапевтическое обучение по изменению образа жизни, профилактике сердечно-сосудистых заболеваний (ССЗ) и соблюдению режима лечения отсутствует в 57% клиник.

**Заключение:** Некоторые критерии ЛКС Казахстана соответствуют требованиям ЕОА в части управления данными, местоположения, инфраструктуры и взаимодействия с пациентами. Однако необходимо улучшение в составе персонала, управлении клиническими исследованиями, а также в интеграции с медицинской инфраструктурой и направлениях пациентов.

**Ключевые слова:** Липидная клиническая сеть, атеросклероз, дислипидемия, исследование осуществимости.

Түйіндеме

## **ДИСЛИПИДЕМИЯҒА ҚАРСЫ КҮРЕС КЛИНИКАЛАРЫН ҚҰРУДЫҢ ЖӘНЕ ҚАЗАҚСТАНДА АТЕРОСКЛЕРОЗҒА ҚАРСЫ КҮРЕС ЖӨНІНДЕГІ ЖОБАНЫ ІСКЕ АСЫРУДЫҢ ОРЫНДЫЛЫҒЫН БАҒАЛАУ**

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**Кіріспе:** Қазақстанның Липидтік Клиникалар Желі (ары қарай – ЛКЖ) 2021 жылы құрылып, липидті бұзылуларды диагностикалау, басқару және емдеуде тұрақты стандарттар жасауға бағытталған, бұл жұмыс Еуропалық Кардиология Қоғамының және Еуропалық Атеросклероз Қоғамының (ары қарай – ЕКК/ЕАК) дислипидемияны басқару бойынша нұсқауларына негізделеді.

Бұл зерттеудің **мақсаты** – Қазақстандағы липидтік клиникалар желісінің негізгі тіректерін бағалау және Қазақстандағы дислипидемия клиникаларының тиімділігін және атеросклероз жобасын іске асыруды бағалау.

**Материалдар мен әдістер:** Бұл зерттеу Қазақстандағы липидтік клиникалар желісін ұйымдастыруды зерттеуге арналған 8 сұрақтан тұратын көлденең кескіндемелі сауалнама әдісін қолданды. 28 клиника қатысты, сауалнамаға қатысушылар жасырын болды. Сауалнама ЕАК Липидтік клиникалар желісін бағалау негізінде әзірленген.

**Нәтижелер:** Дислипидемия клиникаларының 54%-ы амбулаторлық бөлімде орналасқан, ал 11%-ы кардиология бөлімінің немесе аурухана ішіндегі басқа бөлімнің бір бөлімі ретінде орналасқан. Клиникалардың 71%-ы (20) қант диабеті, эндокринология және сирек аурулар бөлімдерімен байланыстар көрсеткен. Сауалнама нәтижелері бойынша ЛКЖ Қазақстандағы қызметкерлер құрамы келесідей бөлінген: дәрігерлер – 26, медбикелер – 20, дислипидемия бойынша генетик маманы – 1, диетолог – 4, ал тағамтанушы жоқ.

Клиникалардың басым бөлігі амбулаторлық бөлімдерде орналасқан, бұл липидтік қызмет көрсету үшін амбулаторлық көмекке үлкен тәуелділікті көрсетеді. Дәрігерлер мен медбикелердің штаты ЛКЖ-ЕАК стандарттарына сәйкес келеді, алайда тағамтанушылар, генетиктер және диетологтардың жетіспеушілігі көпсалалы күтім моделіндегі елеулі олқылық болып табылады. Клиникалардың 57%-ында өмір салтын өзгерту, жүрек-қантаныр ауруларының алдын алу және емдеу режиміне бейімделуге арналған терапиялық білім беру мүмкіндігі бар.

**Қорытынды:** ЛКЖ Қазақстанның кейбір критерийлері ЕАК ЛКЖ талаптарына деректерді басқару, орналасу орны, мекеме және пациенттермен өзара әрекеттесуді басқару тұрғысынан сәйкес келеді. Дегенмен, қызметкерлер құрамы, клиникалық зерттеулерді басқару және денсаулық сақтау жүйесіндегі байланыстыру мен пациенттерді бағыттау жақсартуды қажет етеді.

**Түйінді сөздер:** Липидтік клиникалар желісі, атеросклероз, дислипидемия, құрылымдық зерттеу.

**Для цитирования / For citation / Дәйексөз үшін:**

Bekbosynova M., Ivanova-Razumova T., Kali A., Khamitov S., Daniyarova G., Akzholova K. Assessment of Feasibility of Dyslipidemia Clinics and Implementation Atherosclerosis Project in Kazakhstan // *Nauka i Zdravookhranenie* [Science & Healthcare]. 2024. Vol.26 (4), pp. 46-53. doi 10.34689/SH.2024.26.4.006

Бекбосынова М., Иванова-Разумова Т., Кали А., Хамитов С., Даниярова Г., Акжолова К. Оценка целесообразности создания клиник по борьбе с дислипидемией и реализации проекта по борьбе с атеросклерозом в Казахстане // *Наука и Здравоохранение*. 2024. Т.26 (4). С. 46-53. doi 10.34689/SH.2024.26.4.006

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**Introduction**

Atherosclerotic cardiovascular disease (ASCVD) incidence and mortality rates are declining in many countries in Europe, but it is still a major cause of morbidity and mortality [1].

The European Atherosclerosis Society launched the Lipid Clinics Network project to create a standardized framework across Europe for diagnosing, managing, and treating patients with lipid disorders. This initiative is guided by the European Society of Cardiology (ESC)/EAS guidelines on dyslipidaemia management [2].

More than 500,000 people with cardio vascular diseases (further – CVD) are diagnosed in Kazakhstan each year, and the main cause of morbidity and mortality is arteriosclerotic heart disease (coronary heart disease, myocardial infarction and strokes). According to the data of Institute for health metrics, ischemic heart disease and stroke are leading cause of mortality in Kazakhstan. According to Institute for Health Metrics and Evaluation, patients with coronary heart diseases and strokes associated with high levels of low-density lipoprotein are 41.13% and 11.3% in Kazakhstan [3].

Established in 2021, the Lipid Clinic Network (further – LCN) of Kazakhstan is dedicated to creating a global framework for consistent standards in diagnosing, managing, and treating lipid disorders, guided by the European Society of Cardiology and European Atherosclerosis Society (further - ESC/EAS) Guidelines on dyslipidemia management. The network aims to foster collaboration and education among clinical lipidologists, allowing them to share: patient management experiences, diagnostic insights, information on patient outcomes, and strategies to overcome challenges in providing optimal care.

The Ministry of Health of the Republic of Kazakhstan approves the Roadmap for improvement of medical care for atherosclerosis and lipid metabolism disorders in the Republic of Kazakhstan for 2023 by order.

The Roadmap acts as a regulatory framework for the organization of the atherosclerosis and LDL program in Kazakhstan and contains three key directions. In line with the EAS recommendations, Kazakhstan initiated its Atherosclerosis and Dyslipidemia Program in 2022 to address the aforementioned challenges. This ongoing initiative aims to effectively manage hyperlipidemia, reduce the incidence and mortality rates related to atherosclerotic cardiovascular disease (ASCVD), and enhance the quality

of life for individuals with different forms of dyslipidemia across the country.

**The aim** of this research is to evaluate pillars for lipid clinic network in Kazakhstan and assess the feasibility of dyslipidemia clinics in Kazakhstan and implementation atherosclerosis project in Kazakhstan.

**Materials and methods***Study Design and Participants*

This prospective feasibility study utilized a cross-sectional survey-based design to explore the organization of a lipid clinic network in Kazakhstan. Totally 28 clinics took part on this survey. The inclusion criteria were being a part of lipid clinic network, having the dyslipidemia service. The survey was created on Google Forms platform and conducted between July 3 – July 10, 2024, and participants were approached through various online platforms and social media (e.g., Instagram, WhatsApp, Facebook). All of the respondents were anonymous.

**Survey Instrument**

The survey instrument consisted of a pillars of each contribute to the effective operation of a lipid clinic. The survey included 8 questions with multiple response.

Participants provided information on their location of clinic, how the clinic connected within the health service infrastructure, how are patients referred to the clinic, composition of staff at the clinic, available facilities to the clinic, data management, management of clinical trials, clinical rounds management, patient interaction management.

The questionnaire was developed based on EAS Lipid clinic network evaluation. It was available in both Kazakh and Russian languages.

**Results**

The location of a clinic divided into 4 locations according to the hospital structure:

- An independent unit at the hospital
- Private practice
- Outpatients
- A sub-department within a cardiology department or similar in the hospital

54% of dyslipidemia clinics are located in outpatient department and 11% of clinics are located as a sub-department within a cardiology department or similar in the hospital. The distribution of a location of regional dyslipidemia clinics is described in the Figure 1.

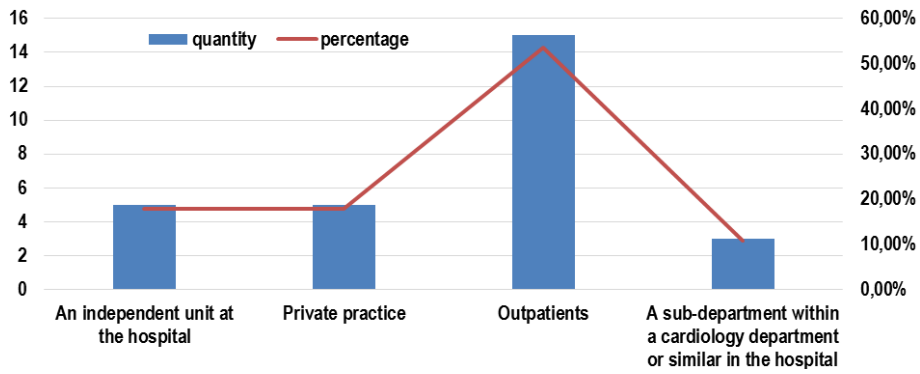
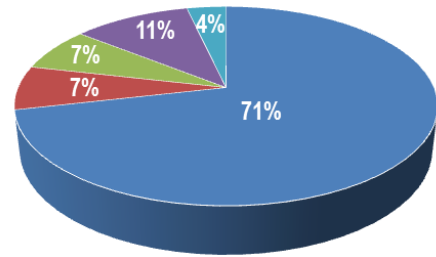


Figure 1. Location of dyslipidemia clinics.

To the survey question “How the clinic connected within the health service infrastructure, how are patients referred to the clinic” - 71% of clinics (20) show connections to hospital departments including diabetes, endocrinology and rare disease units. Connection within the health service infrastructure and patient referral is given in the Figure 2.

Staff of LCN clinics is distributed according to the Figure 3. According to the survey results the staff composition of LCN Kazakhstan is distributed as following: physicians - 26, nurses - 20, Geneticist expert in dyslipidemias - 1, dietitian - 4 work in LCN clinics, nutritionist - 0. Staff distribution is shown in the Figure 3.

All clinics have available facilities to provide high quality service on site and work according to the order of the Minister of Health of the Republic of Kazakhstan dated April 27, 2022 No. KR DSM-37 «On approval of the rules for the provision of specialized medical care in an outpatient setting». List of the available facilities is shown in the Figure 3. Also, clinics surveyed about data management process and results of data management process is given in the Figure 4.



- Connections to hospital departments including diabetes, endocrinology & rare disease units
- For paid consultations
- Via Damumed Integrated Medical Information System
- From the local doctor referred to a cardiologist
- Referral from departments and outpatient

Figure 2. Connection within the health service infrastructure and patient referral.

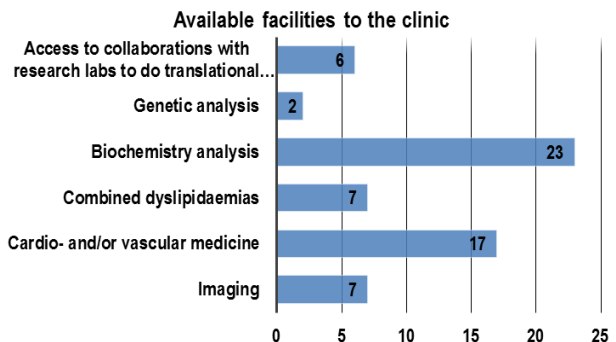
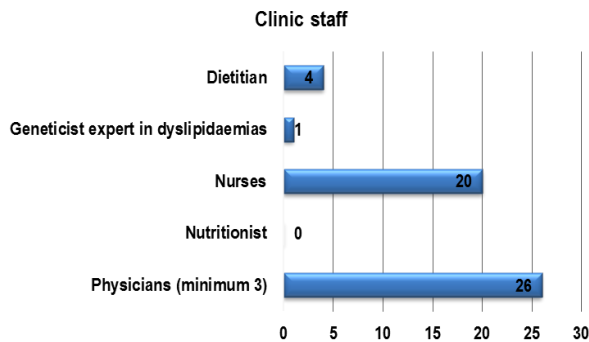


Figure 3. Composition of Lipid Clinics Network Kazakhstan and list of privileged access to/direct onsite services.

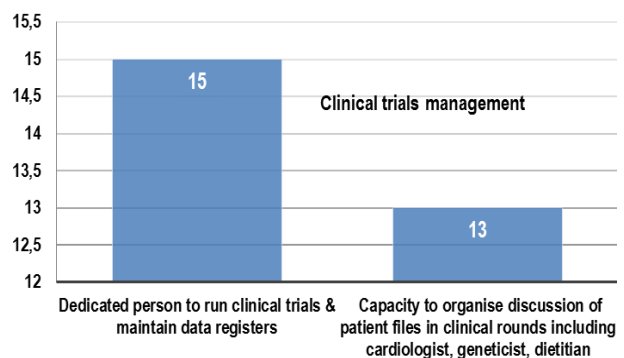
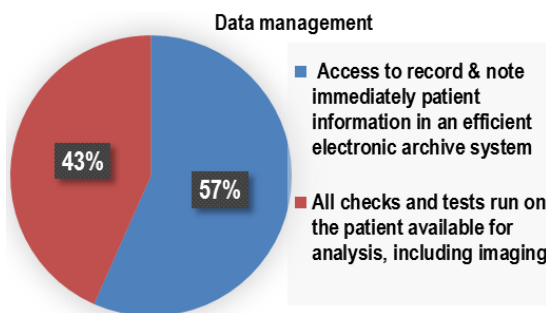


Figure 4. Data management and Clinical trial management.

According to Figure 4 quantity of dedicated person to run clinical trials and maintain data registers – 15 and capacity to organize discussion of patient files in clinical

rounds including cardiologist, geneticist, dietitian is 13 (46%). The management process of the interaction with the patients is given in Figure 5.

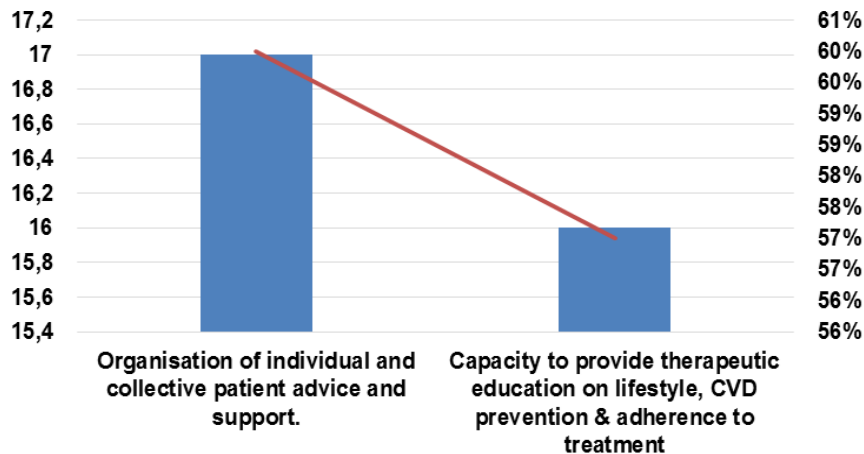


Figure 5. The management of interaction with the patients.

### Discussion

The presented study in line with the studies with similar questionnaires have been aimed to evaluate lipid clinic services in other countries [4, 5, 6]. According to the recommendations of the National Lipid Association Expert Panel the Patient-Centered Management of Dyslipidemia covers targets for intervention in dyslipidemia management which is in line with our findings [13]. The surveys on patients with established coronary heart disease as part of the European Action on Secondary Prevention by Intervention to Reduce Events (EUROASPIRE) and the INTERASPIRE study [9, 10,11] were conducted. Across countries and WHO regions, variability in lipid levels were observed, even with adjustment for age and gender. This leads to an assumption of the effect of genetic diversity and environmental factors [8].

Research studies by EAS have presented a clinician's report of a total of 75.5% of regularly measured Lp(a) tests in clinical practice [5]. The study by Koskinas et al. which was conducted before and after publication of the 2019 ESC/EAS dyslipidemia guidelines, reflects a strong level of adherence to the LDL-C treatment targets which is also outlined in the current ESC/EAS guidelines [6]. The study of cardiovascular disease prevention strategy for the members of the American Academy of Family Physicians illustrates the difference in knowledge, beliefs, and practice patterns between practicing family physicians [7].

However, the surveys conducted in healthcare settings to assess the management of Lipid Clinic Networks are still scarce. Each healthcare unit can utilize the national metric as a standard to develop optimal screening and implementation practices, being a model of excellence for others to follow [12].

### Distribution of the LCN Kazakhstan

Lipid clinic's distribution illustrates key trends of functionality and integration within healthcare systems. 53.60% are situated in outpatient departments, revealing a prevalent reliance for lipid-related services in outpatient units, also indicating lipid departments as an incorporation in larger hospital systems rather than functioning as independent units. This reliance on outpatient settings

ensures patient accessibility and continuity of care but limits the depth of specialized services available in these clinics.

Notably, only 17.90% of clinics operate as independent units within hospitals, reflecting the limited autonomy of lipid clinics and suggesting a need for greater investment in independent lipid departments to enhance specialized care. Similarly, the same percentage of clinics (17.90%) function privately and fully independently, which offers more personalized care but limits the patient volumes and resources compared to larger hospital-based clinics.

Lastly, 10.70% of clinics function as sub-departments within cardiology or similar hospital departments, enhancing interdisciplinary collaboration but potentially curbing the development of specialized lipid-focused services.

### Staff composition

Physicians are well-represented, with 26 doctors, meeting the minimum requirement of three per clinic. This ensures that patients have access to a sufficient number of qualified doctors to manage lipid-related conditions. Nurses are adequately represented, with 20 staff members across the clinics. This aligns with EAS recommendations that emphasize the importance of nurses in patient care, follow-up, and education on lifestyle modifications.

However, the absence of nutritionists across all clinics is a significant shortfall of providing personalized dietary advice which is important in managing dyslipidemia and preventing cardiovascular diseases. Similarly, there is an underrepresentation of dietitians, with only four on staff. With only one geneticist across all clinics, which is below the LCN-EAS standards, limiting the clinics' ability to offer personalized, genetically-informed treatment plans. Addressing these deficiencies is crucial for optimizing patient outcomes in lipid management.

In terms of capacity to organize interdisciplinary patient case discussions, 13 clinics report having the ability to convene clinical rounds involving cardiologists, geneticists, and dietitians. This is a positive sign, as LCN-EAS standards advocate for a multidisciplinary approach to managing dyslipidemia. Regular interdisciplinary discussions are crucial for optimizing patient outcomes, allowing for a holistic view of the patient's condition,

integrating expertise from cardiology, genetics, and dietary management.

#### Facilities

Furthermore, essential facilities are lacking in certain clinics, for example insufficient access to collaborations with research laboratories for translational medicine, as well as inadequate resources for genetic analysis and imaging capabilities. When compared to the LCN standards from the EAS, the availability of key diagnostic and collaborative services in the analyzed clinics reveals a mixed picture, with notable deficiencies in some crucial areas.

Imaging facilities are available in 7 clinics, which represents a significant shortfall when considering the importance of advanced imaging techniques such as carotid ultrasound, coronary artery calcium scoring, and MRI in the assessment of atherosclerosis and cardiovascular risk. For the management of combined dyslipidemias, only 7 clinics provide specialized services, indicating a significant gap. Combined dyslipidemias, which involve abnormalities in multiple lipid fractions, require careful management, and specialized knowledge.

Cardio- and/or vascular medicine is well-represented, with 17 clinics offering this specialty. This aligns with EAS guidelines, as cardiovascular expertise is a core component in managing dyslipidemias and preventing related complications, such as heart attacks and strokes. Biochemical analysis is available in 23 clinics, which is close to full coverage. This is a positive aspect, as regular biochemical testing (lipid profiles, liver function tests, etc.) is critical for monitoring treatment efficacy and adjusting therapeutic interventions in dyslipidemia management.

However, there is a major deficiency in genetic analysis, with only 2 clinics offering this service. The LCN-EAS guidelines emphasize the growing importance of genetic testing, particularly for familial hypercholesterolemia (FH) and other hereditary lipid disorders. Finally, only 6 clinics have access to collaborations with research labs for conducting translational medicine, restricting innovation and the development of novel treatments in lipid management.

In the study about lipid clinic management formation of multidisciplinary care teams, utilization of telemedicine, improvement of advanced technologies and machine learning, were defining factors to optimize lipid clinic management [12]. While the clinics show strengths in cardiovascular medicine and biochemistry, there are critical gaps in imaging, combined dyslipidemia management, genetic analysis, and translational research collaboration. Addressing these gaps is essential for aligning with LCN-EAS standards and improving comprehensive care for dyslipidemic patients.

#### Connection within the health service infrastructure and patient referral

Most clinics are located within outpatient departments, which limits lipid departments from functioning as independent subunits. Instead, lipid clinics are integrated with hospital departments, including those for diabetes, endocrinology, and rare diseases, with patient referrals originating from multiple departments. The majority of patient referrals (71%) come from hospital departments such as diabetes, endocrinology, and rare disease units. This suggests a high level of interdisciplinary collaboration, which reflects the frequent comorbidity between lipid

disorders and these conditions. Such integration likely enhances patient outcomes by facilitating coordinated care and comprehensive management of related diseases.

A smaller proportion of referrals (11%) comes from local doctors referring patients to cardiologists, indicating that primary care providers play a modest but notable role in the referral process. This pathway may be underutilized, suggesting that increased awareness among general practitioners could lead to earlier detection and intervention for lipid disorders.

Consultations based on paid services represent only 7% of the total, highlighting that most referrals are generated within the public healthcare system rather than through private or fee-based models. The same percentage (7%) of referrals comes via the Damumed Integrated Medical Information System, an electronic system designed to streamline patient information and referrals. The relatively low usage of this system may reflect either limited adoption or potential inefficiencies in the referral process.

Lastly, only 4% of referrals originate from other departments or outpatient units, which may suggest that intra-hospital collaboration outside of the primary associated units (diabetes, endocrinology) is less frequent. Increasing these internal referral networks could provide opportunities for broader patient engagement and earlier intervention.

#### Capacity to conduct clinical trials

While most clinics have the capacity to conduct clinical trials and participate in multicenter studies, there is a pressing need to establish good clinical practice standards and provide necessary training. Comparatively to LCN-EAS standards, the data on personnel dedicated to clinical trials and the capacity for organizing interdisciplinary case discussions reveals areas of both progress and need for improvement.

Dedicated personnel for clinical trials and data management are present in 15 clinics, representing a strong commitment to clinical research and patient data management, as the LCN-EAS standards emphasize the importance of having trained professionals to oversee clinical trials, ensure adherence to good clinical practice (GCP), and maintain high-quality data registers. However, with the complexity of lipid disorders and their treatments, expanding this capacity to more clinics is essential for enhancing clinical research output and ensuring comprehensive patient care.

#### Data management

Additionally, most clinics have efficient electronic archive systems that allow for real-time documentation of patient information. The clinics are adequately equipped to offer therapeutic education on lifestyle modification, cardiovascular disease prevention, and treatment adherence, further fostering educational campaigns aimed at patients. When analyzed in light of the LCN-EAS standards, the availability of electronic archive systems and access to comprehensive patient data for analysis highlights both strengths and areas for improvement in the clinics' capacity for effective patient management.

Seventeen clinics have access to effective electronic archive systems, which is a big step toward achieving the LCN-EAS standard for streamlined patient information administration. Electronic health records (EHRs) make it

possible to record patient data in real-time and retrieve it quickly. This is crucial for maintaining patient continuity of care, accurately monitoring patient progress, and promoting interdisciplinary teamwork. In order to guarantee that clinical choices are supported by complete and current patient records, the LCN-EAS places a strong emphasis on the value of effective data management systems. But extending this capability to every clinic would guarantee consistency while most clinics have LCN-EAS compliant electronic archive systems for effective patient data management, many clinics still need to have this feature. Furthermore, enhancing the availability of comprehensive diagnostic data, including imaging, is necessary to ensure that clinical decisions are informed by complete patient assessments, thereby improving the overall quality of care quality of care across the network.

#### The management of interaction with the patients

When evaluated according to LCN-EAS standards, the data on patient advice, support, and therapeutic education indicates areas of both strength and room for improvement.

Organization of individual and collective patient advice and support is implemented in 17 clinics, representing 60% of the clinics surveyed. This level of provision aligns with the LCN-EAS standards, which highlight the importance of both individualized and group-based support for patients with dyslipidemia which addresses specific patient needs and concerns, while collective support can foster peer learning and shared experiences.

Capacity to provide therapeutic education on lifestyle changes, CVD prevention, and adherence to treatment is present in 16 clinics, which constitutes 57% of the clinics. This is a positive indication of alignment with LCN-EAS guidelines, which stress the importance of educational initiatives in managing dyslipidemia. Therapeutic education is vital for empowering patients with knowledge about lifestyle modifications, dietary adjustments, and adherence strategies to prevent CVD and manage lipid levels effectively. However, the fact that not all clinics have this capacity indicates a need for further development in educational programs across the network. Ensuring that all clinics offer comprehensive patient support and robust educational programs will be essential for improving patient outcomes and achieving full compliance with LCN-EAS standards.

#### Conclusion

Our findings indicate that LCN Kazakhstan needs to expand its clinical staff by recruiting additional genetic specialists, nutritionists, and dieticians.

The analysis suggests that while outpatient and private practice settings dominate, there is an underrepresentation of independent lipid clinics. Increasing the number of autonomous units or strengthening sub-departments within cardiology could help enhance the provision of specialized lipid management services.

Overall, the analysis underscores the importance of fostering interdisciplinary collaboration, improving referral processes from primary care, and maximizing the use of electronic systems like Damumed to enhance the efficiency and reach of lipid clinics.

Many clinics are aligned with LCN-EAS standards in terms of clinical trial management and multidisciplinary care, there is a clear need to increase the presence of

dedicated personnel for research and enhance interdisciplinary collaboration in patient management to fully meet the guidelines. Addressing these gaps would help improve both research quality and patient outcomes in dyslipidemia care.

In summary, while the majority of clinics are meeting LCN-EAS standards for organizing patient advice and support, and for providing therapeutic education, there remains an opportunity to enhance these services.

#### Disclosures

There is no conflict of interest for all authors.

#### Acknowledgements

None.

#### Funding

This research has been funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (Grant No. BR21881970, Name: Development of new screening methods, to prevent early mortality and treatment of cardiovascular-diseases of atherosclerotic genesis in patients with atherosclerosis). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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