

УДК 616.126.1-002-022.6/7

DOI: <https://doi.org/10.17816/PAVLOVJ656011>

# Триумф эпонимов в учении об инфекционном эндокардите: историческое наследие или клиническая целесообразность?

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## АННОТАЦИЯ

**Введение.** Не один год ведется дискуссия о целесообразности использования медицинских эпонимов (МЭ). С одной стороны, некоторые из них уже стали потенциально архаичными и вводят в заблуждение. Однако с другой, ввиду исторического контекста и ассоциации с великими учеными, клиницистами, они дают эмоциональную вовлеченность в процесс запоминания сложной медицинской информации и формируют образное представление о клинической картине, поэтому могут быть целесообразны как минимум с позиций педагогического процесса.

**Цель.** Провести анализ исторических и современных литературных источников с целью определения целесообразности использования МЭ в научной литературе и клинической практике на примере инфекционного эндокардита (ИЭ) как заболевания с большим количеством устойчивых МЭ.

Проведенный анализ позволил выделить две группы категорий в дискуссии о МЭ. Аргументы в пользу отказа от МЭ: (1) им не хватает точности — один и тот же эпоним может обозначать несколько разных понятий, симптомов, заболеваний; (2) нередко заслуженный человек даже не был первым, кто описал состояние (так, узелки Ослера описал не У. Ослер, а пятна Рота — не М. Рот); (3) некоторые МЭ трудно выучить в силу сложных фамилий, многосоставного подхода к формулировке термина (три фамилии в эпониме — для медицины не редкость); (4) излишняя этноцентричность — преобладание фамилий ученых, публикующихся в определенных странах, журналах. Безусловно, в формировании МЭ есть определенный субъективизм, склонность медицинского сообщества к стереотипному мышлению и элемент случайности. Аргументы в пользу сохранения МЭ: (1) играют значимую лингвистическую, культурную и воспитательную роль: являются важной особенностью языка и традиций, приближают студентов к истории медицины и культурному контексту; медицина — это наука, которая должна стремиться к тому, чтобы в центре ее интересов был человек: и как пациент, и как личность в истории; (2) МЭ облегчают общение между коллегами; исторический опыт сам сохранил для нас нужные, важные, ценные МЭ, при этом устранив существенную часть не совсем удачных терминов (так, в рамках ИЭ примерами краткосрочной жизни МЭ являются термины «болезнь Черногоубова» и «эндокардит Ослера»).

**Заключение.** Современный научный язык основан на описательной терминологии. Тем не менее авторы считают преждевременным отказываться от МЭ как явления. Само по себе сохранение МЭ в течение достаточно длительного исторического периода и их широкое употребление в настоящее время, в т. ч. в клинических рекомендациях, международных классификациях, продемонстрировали полезность МЭ. Однако подход к использованию МЭ в клинической практике и научных публикациях должен быть разумным и опираться не только на исторический опыт, но и на существующие в настоящее время профессиональные нормы.

**Ключевые слова:** эпоним; инфекционный эндокардит; диагностические критерии; семиотика; медицинская терминология; Ослер; узелки Ослера; Либман; неинфекционный эндокардит; пятна Рота

## Для цитирования:

Никулина Н.Н., Шопина К.С. Триумф эпонимов в учении об инфекционном эндокардите: историческое наследие или клиническая целесообразность? // Российский медико-биологический вестник имени академика И. П. Павлова. 2025. Т. 33, № 1. С. 157–166. DOI: <https://doi.org/10.17816/PAVLOVJ656011>

DOI: <https://doi.org/10.17816/PAVLOVJ656011>

# Triumph of Eponyms in the Theory of Infective Endocarditis: Historical Legacy or Clinical Reasonability?

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## ABSTRACT

**INTRODUCTION:** For many years, there has been a discussion about the appropriateness of using medical eponyms (ME). On the one hand, some of them have already become potentially archaic and misleading. However, on the other hand, in the historical context and association with great scientists and clinicians, they provide emotional involvement in the process of memorizing complicated medical information and create a figurative image of the clinical picture, and in this sense their use can be reasonable, at least from positions of the pedagogical process.

**AIM:** To analyze historical and modern literature sources with the aim to determine the appropriateness of using ME in the scientific literature and clinical practice on an example of infective endocarditis (IE) as a disease with a large number of well-established ME.

The conducted analysis permitted to distinguish two groups of categories in the discussion of ME. Arguments in favor of refusing ME: (1) they lack precision the same eponym can denote somewhat different concepts, symptoms, diseases; (2) even an honored person was often not the first to describe a certain condition (thus, Osler nodes were not described by W. Osler, and Roth's spots not by M. Roth); (3) some ME are difficult to memorize due to complex surnames, polysynthetic principle of the formation of the term (three surnames in an eponym is a usual case in medicine); (4) excessive ethnocentricity the predominance of surnames scientists published in certain countries, journals. Needless to say, there is certain subjectivity, tendency of the medical community to stereotyped thinking and an element of accidental in formation of ME. Arguments in favor of preserving ME: (1) they play a significant linguistic, cultural and educational role: being an important characteristic of language and traditions, they bring students closer to the history of medicine and the cultural context; medicine is a science that should strive to place a human in the center of its interests, both as a patient and as a personality in history; (2) ME facilitates communication between colleagues; historical experience itself has preserved for us necessary, important, valuable ME, at the same time having eliminated a significant part of not very successful terms (thus, speaking about IE, examples of short-term life are the terms 'Chernogubov's disease' and 'Osler's endocarditis').

**CONCLUSION:** The modern scientific language is based on descriptive terminology. Nevertheless, the authors consider it premature to abandon ME as a phenomenon. The fact that ME preserved within a fairly long historical period and are currently widely used, among other things, in clinical recommendations and international classifications, have demonstrated the usefulness of ME. However, the approach to using ME in clinical practice and scientific publications should be reasonable and rest not only on the historical experience, but also on the current professional standards.

**Keywords:** *eponym; infective endocarditis; diagnostic criteria; semiotics; medical terminology; Osler; Osler's nodes; Libman; non-infectious endocarditis; Roth's spots*

## For citation:

Nikulina NN, Shopina KS. Triumph of Eponyms in the Theory of Infective Endocarditis: Historical Legacy or Clinical Reasonability? *I. P. Pavlov Russian Medical Biological Herald*. 2025;33(1):157–166. DOI: <https://doi.org/10.17816/PAVLOVJ656011>

Received: 15.02.2025

Accepted: 18.03.2025

Published: 31.03.2025

## LIST OF ABBREVIATIONS

ACS — acute coronary syndrome  
CHD — coronary heart disease  
COVID-19 — Coronavirus Disease 2019  
IE — infective endocarditis  
PE — pulmonary embolism  
PCR — polymerase chain reaction

*Medical eponyms...  
To the doctor, fame;  
to the patient, confusion;  
to the unwary, a minefield;  
to the initiated, a treasure...*

A. Varatharaj [1]

## INTRODUCTION

Medical eponyms are widely used in clinical practice and scientific literature, which shows that the history of medicine is much more than a simple catalogue of discoveries. More than 8 thousand medical eponyms are presently estimated [2, 3]. However, for more than one year the discussion has been held about the reasonability of using eponyms in description of syndromes and diseases. On the one hand, some of them have become potentially archaic and deluding. On the other hand, in terms of historical associations with great scientists and clinicians, they bring emotional involvement in the process of memorizing complicated medical information and create a vivid idea of a clinical picture, which justifies their use from minimum the pedagogical point of view [4].

If you are looking for a disease that is most typical for internal medicine in terms of variability of the clinical picture and use of eponyms, you can hardly find something more suitable than infective endocarditis (IE). Using this example, one can clearly examine the historical context of the emergence of eponyms as a continuum of formation of the disease theory as a whole, and the issue of relevance of using eponyms in modern clinical picture.

The **aim** of this study to analyze historical and modern literature sources to determine the appropriateness of using medical eponyms in the scientific literature and clinical practice on an example of infective endocarditis (IE) as a disease with a large number of well-established eponyms.

## Ground zero. William Osler is the foundation stone of IE theory

For many of us, modern ideas about the connection between William Osler (1849–1919) and IE are associated with the eponym **Osler's nodes**. For the sake of historical justice, it should be noted that this symptom was shown to W. Osler by John Alexander Mullin (1835–1899) from Hamilton, Canada, in 1888 [5]. W. Osler himself recognized the priority of another clinician in description of this syndrome [6], however, the established term Osler's nodes is a kind of homage to Sir William Osler. According to Harvey Cushing<sup>1</sup> (1869–1939), it is W. Osler who gave *'the first comprehensive account in English of the disease and did much to bring the subject to the attention of clinicians'* [6].

So, exactly 140 years ago, in March 1885, young William Osler, a recently appointed Professor of Clinical Medicine at the University of Pennsylvania, delivered three so-called Gulstonian Lectures on 'Malignant Endocarditis' at the Royal College of Physicians. They were soon published in the British Medical Journal [6, 7].

As R. D. Pruitt (1982) noted *'...these lectures, and Osler himself understood, were not revolutionary either in content or in concept...'*<sup>2</sup> [6, 8, 9]. Indeed, the lectures contained a historical summary of descriptions of the condition and a detailed description of 32 cases that he *personally observed* at the Montreal General Hospital, supported by the data of two large series of autopsies. Besides, W. Osler summarized some developments in the relatively new science of microbiology that seemed relevant to him, and obviously recognized their significance [6].

<sup>1</sup> In 1925, H. Cushing was given the Pulitzer prize for William Osler biography in three volumes.

<sup>2</sup> Traditionally, the first mention of IE dates back to the early 16<sup>th</sup> century and belongs to the French mathematician, astronomer, personal physician to King Henry II and Catherine de Medici, Jean François Fernel. In 1646, Lazare Riviere described endocarditis of the aortic valve. Sixty years later, Giovanni Battista Morgagni (1682–1771) in his main work 'De sedibus et causis morborum per anatomen indagatis libri V' described a 36-year-old patient with 'fluid in the lungs', a rare pulse, edema and gonorrhea, in whom an autopsy revealed rheumatic aortic valve disease complicated by endocarditis.

Osler's characteristic clarity and meticulousness allowed him to establish fundamental principles of the classification and clinical presentation of the disease, thereby developing a conceptual approach that was finally formulated in his article of 1909. Osler proposed a simple classification of endocarditis based on the clinical presentation and rejected the previously used terminology based on anatomical features ('ulcerative endocarditis', 'verrucous endocarditis') [8]. He identified two forms of the disease, which he described as *simple* and *malignant* endocarditis. Owing to his many-year work as a physician, teacher, and author of the outstanding medical textbook of his time, he was able to draw the attention of his contemporaries to a little-studied disease and its detailed clinical features, thereby increasing the level of lifetime diagnosis, which at that time was only about 50% [7].

Surely, a sceptic might doubt the importance of early diagnosis of IE at the time several decades away from the discovery of antibiotics. The tragedy of that historic period was that so thoroughly studied clinical signs permitted a fairly early diagnosis of IE, but the disease itself was incurable at that time and in fact fatal (yes, single cases of recovery were described in literature, but from today's perspective they raise questions, at least in terms of a confirmed diagnosis [6–8]).

Despair caused by the diagnosis of endocarditis at that time, is illustrated by a record made by Alfred S. Reinhart, a medical student of Harvard University, in his diary in 1931: *'No sooner had I removed the left arm of my coat, than there was on the ventral aspect of my left wrist a sight which I shall never forget until I die. There greeted my eyes about fifteen or twenty bright red, slightly raised, hemorrhagic spots about 1 millimeter in diameter... I took one glance at the pretty little collection of spots... and calmly said: 'I shall be dead within six months' [10].* Alfred Reinhart had suffered rheumatic fever in his childhood, and, being a medical student, was painfully aware of increased risk of developing endocarditis. He was right with accuracy of a month and died exactly six months after he had noticed the ill-fated rash [11].

The evident association of IE with the previous chronic rheumatic lesion of the valves was established quite early. W. Osler assigned this discovery to Sir James Paget (1814–1899). Osler himself noted signs of the past rheumatic fever in about ¾ of clinical cases observed by him, which was considerably more than he expected [6].

The discovery of penicillin obtained from fungal mycelium, made a revolution in the treatment of bacterial infections including IE. The efforts of Nobel-prize winners Laureates Alexander Fleming, Howard Florey and Ernst Chain, ushered in era of effective treatment of IE. In 1945, Dawson and Hunter concluded that IE caused

by *Streptococcus viridans*, could be successfully treated with penicillin [8].

The first experience of using penicillin is interesting. ...Louis Weinstein writes: *'My interest in infective endocarditis was first aroused as an intern in medicine at University Hospital in Boston in 1942–1943. I had the opportunity then to study a large number of patients and to participate in the first trial of treatment with penicillin under the aegis of Chester S. Keefer, the physician in-chief at the hospital, who controlled the use of penicillin in the US during a study conducted by the National Academy of Sciences. A large number of patients with this infection from all over the country were admitted to the hospital. Treatment consisted of 5 thousand units of penicillin given intravenously every three hours for ten days. This dose of the antibiotic proved far too small and was used only because the supply of the drug was very limited. None of the patients survived' [12].*

The modern name of this infection, infective endocarditis, was popularized in the 1960s by Louis Weinstein and Phillip I. Lerner, who described *other possible, although uncommon, causes* in addition to bacterial infections [13], thus demonstrating the inconsistency of the previous term 'bacterial endocarditis'.

However, let's come back to W. Osler... In 1908, he published his major work 'Endocardites infectieuses chroniques' about the long-term course of endocarditis in 10 patients (the duration of the disease ranged from 4 to 13 months), which he wrote for over 20 years. The most frequently identified microorganism was streptococcus. This was the first description of subacute bacterial endocarditis (which was also called **Osler's endocarditis**) [8]. Subsequently, the eponym *Osler's endocarditis* did not take hold, giving way to the descriptive name — *subacute IE*.

### Emanuel Libman the figure behind two eponyms in the theory of endocarditis

Emanuel Libman (1872–1946) was a key figure in identifying the most common symptoms of IE, as well as in introducing bacteriological examination of blood as a diagnostic tool in the USA [14]. It should be noted that the bacteriological examination of blood was first conducted in the UK by Horder (1905) and a year later in the USA by Libman (1906). Since then, the method has been regularly used in clinical practice as an integral part of diagnosis of subacute IE. Blood culture has become a 'tool' permitting to recognize IE at earlier stage and, therefore, to identify less evident clinical manifestations of the disease [14, 15].



E. Libman wrote extensively about signs and symptoms of IE, noting characteristic murmur, fever, splenomegaly, anemia and transient petechiae (mostly sunconjunctival). He used those data to make a diagnosis to the famous Austrian conductor (New York Orchestra) and composer Gustav Mahler (1860–1911), who had a chronic rheumatic heart disease with damage to the mitral valve, and suffered several cases of severe tonsillitis in the autumn of 1910. Despite the fever that appeared in February 1911, Mahler continued giving concerts, but at the same time turned to one of the most influential doctors of the time, E. Libman. Dr. Libman noted *'loud systolic-presystolic murmur against the background chronic rheumatic mitral valve disease, history of prolonged low-grade fever, palpable spleen, characteristic petechiae on the conjunctiva...'* Blood cultures confirmed the diagnosis, and Mahler decided to cross the Atlantic and die at home in Vienna. The disease progressed and was complicated by multiple septic emboli. On May 18, 1911, Gustav Mahler died [8, 14].

The subconjunctival hemorrhages mentioned in this fragment, were first described in the Russian literature by Trifon G Lukin, a pupil to A. A. Ostroumov, in his article *Ulcerative malignant endocarditis* (1909) it is not surprising that they were subsequently termed **Lukin–Libman symptom/sign/spots** [8, 16, 17].

Despite E. Libman's extensive medical interests, it was most likely his 1924 description (with Dr. Benjamin Sacks, 1896–1971) of non-infectious vegetations in patients with systemic lupus erythematosus that made him widely known in the medical community. Immune-mediated damage to the heart valves is known as **Libman–Sacks disease/endocarditis** [8, 18].

### Edward Janeway a doctor who confused students' understanding of Osler's nodes

In 1899, Dr. Edward Janeway (1841–1911) described *painless* lesions on palms and soles of patients with endocarditis. The aim of the description was to provide clinicians with an effective method of differentiating between endocarditis and another 'malignant process' accompanied by fever and weight loss. The term *Janeway's lesions* (in Russian-language sources **Janeway's spots**) was introduced by E. Libman who also emphasized their painless character [14]. In contrast to the painless Janeway's spots, *Osler's nodes* are *painful* and localize in the thickness of the fingers and toes [19]. In the 1909 issue of the 'Quarterly Journal of Medicine', W. Osler described the ephemeral nature of both types of lesions [20].

Interestingly, the confusion between Osler's nodes and Janeway's spots exists not only in the minds of

students, but also in the pages of the professional literature. On the one hand, they are included in different groups of minor diagnostic criteria (Janeway's spots embolic dissemination in vessels; Osler's nodes immunological phenomena) of clinical recommendations [21], and on the other hand, they can be very close from the point of view of pathogenesis and histology [14, 19].

### Roth's spots that were not described by Roth

The term Roth's spot takes the origin from Moritz Roth (1839–1914), the Swiss *pathologist*, who in 1872 described white and red spots on the eye retina. To note, he had never described the presence of a red spot on the retina in combination with a white spot in the center this symptom was described 6 years later by Roth's namesake German physician Moritz Litten (1845–1907), who introduced into clinical practice the term based on a play on words 'Roth spot' [22, 23].

M. Litten writes that hemorrhages into the retina with a white center are in 80% of cases associated with a subacute bacterial endocarditis. It is important to note that indeed, Roth's spots are most often associated with IE, however, they can be observed in a wide variety of diseases, including leukemia, anemia, hypertensive and/or diabetic retinopathy, preeclampsia and hypoxia [22].

### Duke criteria are a rare case of eponym named after an institution

Many authors' teams have attempted to develop diagnostic criteria for IE, which would, on the one hand, possess high sensitivity, and, on the other hand, high specificity, so that IE could be effectively differentiated from a number of infectious and immune diseases. The first criteria were developed in the 1980s at Beth Israel Hospital in Boston.

These criteria were based on the clinical picture, verification of bacteremia and histology, but they did not take into account the results of echocardiography. Another drawback of those criteria was the possibility of establishing a *definite* diagnosis of IE only on the basis of a pathological, i. e. postmortem, examination. It turned out that clinicians treated patients with only a *possible* or *probable* diagnosis [8, 24].

In 1994, David T. Durack and colleagues from Duke University systematized and summarized data on IE, including their own data, and replaced the pathological criterion for verification of vegetations with an echocardiographic one, which formed the basis of a new classification [8, 25]. The authors identified a *definite*, *probable* and *rejected* diagnosis of IE, upon that, a *definite* diagnosis could be established during the patient's lifetime.

As a result, Duke University developed diagnostic criteria for IE using the modification of D. T. Durack and the principle of Thomas Duckett Jones (1899–1954), who proposed dividing the criteria into *major* and *minor* [8]. Thus, echocardiography and blood bacteriology acquired equal weight in the diagnosis of IE (as two independent major diagnostic criteria) [21], which increased the sensitivity of diagnosis [8]. The original Duke criteria were published in 1994 and modified in 2000. Thus, the **Duke criteria** is not only an eponym, but also an official term of international clinical guidelines for IE [21].

### Osler's endocarditis and Chernogubov's disease are examples of short life of eponyms

During the Grate Patriotic War and the post-war period, there was a sharp rise in morbidity with IE, which led to an increase in mortality to 78%–92%. At that time, a discussion unfolded in the pages of the periodical medical literature between G. F. Lang and B. A. Chernogubov on the pathogenesis of a protracted variant of septic endocarditis. Academician G. F. Lang considered the disease to be an evolutionary form of rheumatic fever, while B. A. Chernogubov considered it to be an independent disease that develops on *intact* valves [8, 18]. In 1948, the discussion between the scientists found its resolution at the Moscow Regional Clinical Conference, where the theory of B. A. Chernogubov was recognized. In 1949, at the XXII Congress of Therapists of the USSR, it was proposed **to understand protracted septic endocarditis** as streptococcal primary endocarditis with a prolonged course and to call it **Chernogubov's disease** [8]. Subsequently, the term *Chernogubov's disease* did not catch on [8, 18].

Another short-lived eponym was described above **Osler's endocarditis** as a synonym to subacute bacterial endocarditis. What unites these two eponyms is an attempt to denote not the *clinical manifestations* (for which the descriptive approach seems excessive, bulky for routine clinical practice eponyms in this situation redeem with their brevity and relative specificity), but the *variant of the disease* (when the descriptive approach gives a brief and concise idea of the subject of discussion).

## DISCUSSION

Eponyms have been known to mankind since when a piece of an apple of knowledge stuck in Adam's throat (*Adam's apple*). Translated from Greek, ἐωνυμία means the name that reflects an attribute given as a nickname. In a broader sense, the adjective ἐπώνυμος refers to the use of names of people (eponyms) or places (toponyms), real or fictional (an example of a fictional

name in a medical eponym is *Pickwick syndrome* which got its name after the novel 'The Posthumous Papers of the Pickwick Club' by Charles Dickens), to describe some phenomena. The term 'eponym' entered the English language in the mid-19<sup>th</sup> century, denoting both the one who gave the name and the phenomenon named, which further complicated its understanding. The golden age of eponyms came in the 1950s [26].

Eponyms are daily used in the clinical practice and scientific literature, being a part of the tradition, culture and history of medicine. Eponyms connect us with the great minds of the past and make medicine more vivid. However, there occur discussions in the press with a certain periodicity, about the time to abandon medical eponyms.

### Arguments in favor of abandoning medical eponyms

1) They lack precision the same eponym can be used to denote somewhat different concepts, symptoms, diseases, which, of course, leads to confusion and hinders effective scientific discussion (there are known a series of articles illustrating this aspect: '4 Down syndrome', '11 Kaposi sarcoma', '15 Osler-Rendu-Weber disease', '6 Frey syndrome...', etc.) [27–30]);

2) A distinguished person may often be not the first who described the condition (thus, Osler's nodes were not described by Osler and Roth's spots not by Roth). The name in an eponym is traditionally not revised due to the significance for the historical context of the person honored by the term, even if erroneously (a matter of historical justice).

3) Eponyms are often difficult to remember due to the complex pronunciation of foreign-language surnames and to a multi-component approach to the formulation of the term (three surnames in an eponym are not uncommon in medicine);

4) There is also some ethnocentricity in the choice of the person whose name the term will subsequently bear, including the predominance of the names of authors published in English, given that the first or parallel description was made by another scientist or clinician. We believe that there is a certain subjectivity, a tendency of the medical community to stereotypical thinking and an element of occasional in this...

### Arguments in favor of preserving medical eponyms

1) They play a significant linguistic, cultural and educational role: being an important characteristic of language and traditions, they bring students closer to the history of medicine and the cultural context. Besides, medicine is a science that should strive to place a human in the center of its interests, both as a patient and as a personality in history;

2) Eponyms facilitate communication between colleagues. Survival of eponyms in itself over decades and even centuries evidences the appropriateness of their use. Probably, a more reasonable practice is the use of classic eponyms, which outlived the time due to their clinical relevance and specificity.

Taking into account the above, it becomes obvious that one should not make a decision about the destiny of eponyms as a *phenomenon in whole*, since the historical experience itself has preserved the necessary, important, valuable eponyms for us, having eliminated a significant number of not very successful terms (examples of short-lived eponyms concerning IE are *Chernogubov's disease* and *Osler's endocarditis*).

We believe that eponyms corresponding to *diseases*, may not reflect the modern classification clearly enough. Moreover, in classification of diseases the *descriptive* principle of terminology formation predominates. Eponyms to denote diseases are left in the International Classification of Diseases and Related Health Problems, 11<sup>th</sup> revision, only as an exception most well established and in most cases non-cardiologic ones. Therefore, it is not that easy to defend the use of eponyms specifically for *diseases*, compared to alternative names, since eponyms denoting *clinical manifestations* of diseases are probably useful heuristic<sup>3</sup> techniques that help remember both the syndrome itself and the person who first described it or deserves to have his name immortalized in the terminology.

The main problem with the complete refusal of eponyms is that the advantages of descriptive terminology come into conflict with *a possibility to express complex concepts in just a few words*. To solve this practical problem, it is customary to use abbreviations and acronyms, which currently are gradually replacing traditional eponyms. An acronym is a word formed from the initial letters of words included in the phrase; it is *a specific type of abbreviation that is pronounced together* as a separate word, in contrast to ordinary abbreviations, which are pronounced *sequentially letter after letter* [31]. One example of acronyms in medicine is COVID-19 — Coronavirus Disease 2019, a disease caused by coronavirus 2019 [32]. An example of classic abbreviations in medicine are CHD — coronary heart disease [34], PCR — polymerase chain reaction [35], ACS — acute coronary syndrome [36]. Acronyms are actively used in written and oral communication, as well as in the media. They help make the text more concise, simplify the memorization and understanding complex terms and names of

organizations. It is important to remember that in different fields of activity there may be identical acronyms for different concepts, so in the context of communication and training it is useful to take into account the specifics of a particular field.

## CONCLUSION

The correct use of eponyms in medical terminology is one of the basic conditions of successful communications in the medical community. Modern scientific language is based on descriptive terminology. Should eponyms be completely abandoned? Surely, not. Tradition and widespread use eventually introduced the eponyms in the medical language and have historically demonstrated their usefulness. However, the approach to using medical eponyms in clinical practice and scientific publications should be reasonable and rest not only on the historical experience, but also on the current professional standards.

## ADDITIONALLY

**Funding.** This article was not supported by any external sources of funding.

**Conflict of interests.** The authors declare no conflicts of interests.

**Contribution of the authors:** *N. N. Nikulina* — concept and design of study, editing; *K. S. Shopina* — selection of literary sources, analysis of data, writing the text. The authors confirm the correspondence of their authorship to the ICMJE International Criteria. All authors made a substantial contribution to the conception of the work, acquisition, analysis, interpretation of data for the work, drafting and revising the work, final approval of the version to be published and agree to be accountable for all aspects of the work.

**Финансирование.** Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

**Конфликт интересов.** Авторы заявляют об отсутствии конфликта интересов.

**Вклад авторов:** *Никилина Н. Н.* — концепция и дизайн исследования, редактирование; *Шопина К. С.* — подбор литературных источников, анализ данных, написание текста. Авторы подтверждают соответствие своего авторства международным критериям ICMJE (все авторы внесли существенный вклад в разработку концепции, подготовку статьи, прочли и одобрили финальную версию перед публикацией).

<sup>3</sup> Heuristics is understood as a complex of techniques and methods that facilitate and simplify the solution of cognitive, constructive, and practical tasks.

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