

SCIENTIFIC NOMENCLATURE OF MEDICAL TERMS AND ITS LINGUISTIC FEATURES

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Abstract. *The scientific nomenclature of medical terms represents a highly systematized layer of language that bridges medicine, linguistics, and international communication. This study investigates the structural, semantic, and functional properties of medical terminology with a particular focus on its linguistic features. Drawing on a comparative corpus of English, Russian, and Uzbek medical terms, as well as classifications presented in Scopus-indexed literature, the research highlights how medical terminology develops through processes of word-formation (affixation, compounding), borrowing (primarily from Latin and Greek), and semantic specialization. The findings indicate that medical terms function not only as precise designators of scientific concepts but also as carriers of cultural and historical layers of medical knowledge. For example, classifications distinguish between monosemantic terms (e.g., appendicitis), multivalent terms (e.g., shock), and hybrid internationalisms (e.g., bronchitis), reflecting both universality and linguistic diversity across professional discourse. The study also reveals the prevalence of terminological synonymy, with 12–15% of medical terms existing in synonymous pairs or series, which raises challenges for standardization yet enriches scientific communication.*

Keywords: *Medical terminology, Scientific nomenclature, Latin and Greek borrowings, Translation and cross-linguistic adaptation, Standardization of medical terms, Multilingual medical communication.*

Аннотация. *Научная номенклатура медицинских терминов представляет собой высокосистематизированный слой языка, который соединяет медицину, лингвистику и международную коммуникацию. Данное исследование рассматривает структурные, семантические и функциональные свойства медицинской терминологии с особым акцентом на её лингвистические особенности.*

Основываясь на сравнительном корпусе медицинских терминов английского, русского и узбекского языков, а также на классификациях, представленных в научных публикациях, индексируемых в базе данных Scopus, исследование показывает, что медицинская терминология формируется посредством различных процессов словообразования (аффиксации, словосложения), заимствования (преимущественно из латинского и греческого языков) и семантической специализации.

Полученные результаты свидетельствуют о том, что медицинские термины функционируют не только как точные обозначения научных понятий, но и как носители культурных и исторических слоёв медицинского знания. Например, существующие классификации выделяют моносемантические термины (например, appendicitis), полисемантические термины (например, shock), а также гибридные интернационализмы (например, bronchitis), что отражает одновременно универсальность и языковое разнообразие профессионального дискурса.

Кроме того, исследование выявляет распространённость терминологической синонимии: около 12–15% медицинских терминов существуют в виде синонимических пар или рядов, что создаёт определённые трудности для стандартизации, но одновременно обогащает научную коммуникацию.

Ключевые слова: *медицинская терминология, научная номенклатура, латинские и греческие заимствования, перевод и межъязыковая адаптация, стандартизация медицинских терминов, многоязычная медицинская коммуникация.*

Annotatsiya. Tibbiy terminlarning ilmiy nomenklaturasi tilning yuqori darajada tizimlashtirilgan qatlamini tashkil etib, tibbiyot, tilshunoslik va xalqaro ilmiy kommunikatsiyani o'zaro bog'laydi. Mazkur tadqiqot tibbiy terminologiyaning strukturaviy, semantik va funksional xususiyatlarini, ayniqsa uning lingvistik jihatlarini tahlil qilishga qaratilgan.

Ingliz, rus va o'zbek tillaridagi tibbiy terminlarning qiyosiy korpusi hamda Scopus bazasida indekslangan ilmiy manbalarda keltirilgan tasniflarga asoslanib, tadqiqot tibbiy terminologiyaning so'z yasalishi jarayonlari (affiksatsiya, qo'shma so'zlar), o'zlashuv (asosan lotin va yunon tillaridan) hamda semantik ixtisoslashuv orqali shakllanishini ko'rsatadi.

Tadqiqot natijalari shuni ko'rsatadiki, tibbiy terminlar nafaqat ilmiy tushunchalarning aniq nomlovchisi sifatida, balki tibbiy bilimlarning madaniy va tarixiy qatlamlarini aks ettiruvchi vosita sifatida ham xizmat qiladi. Masalan, mavjud tasniflarda monosemantik terminlar (appendicitis), ko'p ma'noli terminlar (shock) hamda gibrid internatsional terminlar (bronchitis) ajratib ko'rsatiladi. Bu holat professional ilmiy diskursda universallik bilan bir qatorda lingvistik xilma-xillik ham mavjudligini ko'rsatadi.

Shuningdek, tadqiqot tibbiy terminologiyada terminologik sinonimiyaning keng tarqalganligini ham aniqlaydi: tibbiy terminlarning taxminan 12–15 foizi sinonimik juftliklar yoki qatorlar shaklida uchraydi. Bu holat terminologiyani standartlashtirish jarayonida muayyan qiyinchiliklarni yuzaga keltirishi mumkin, biroq shu bilan birga ilmiy kommunikatsiyani yanada boyitadi.

Kalit so'zlar: tibbiy terminologiya, ilmiy nomenklatura, lotin va yunon tillaridan o'zlashmalar, tarjima va tillararo moslashuv, tibbiy terminlarni standartlashtirish, ko'p tilli tibbiy kommunikatsiya.

Introduction. Medical terminology represents one of the most complex and systematized subsets of scientific nomenclature, serving as the foundation of effective communication within the healthcare system. Unlike common vocabulary, medical terms are created to provide precision, universality, and clarity when describing the anatomy, physiology, pathological conditions, diagnostic procedures, and therapeutic interventions of the human body. This universality is not accidental; rather, it stems from a historically rooted tradition of term formation in Latin and Greek, which has allowed medicine to maintain consistency across national and linguistic boundaries [26].

The growth of medical science over centuries has contributed to the exponential expansion of its nomenclature. Historical data suggest that the lexicon of medicine grew from approximately 1,000 terms in the 10th century to over 45,000 by the mid-20th century, and today, the corpus exceeds half a million terms [10]. This rapid expansion was driven not only by discoveries in anatomy and pathology but also by advances in pharmacology, biotechnology, and clinical practice. Modern medicine, therefore, relies on a dynamic system of terms that evolve continuously, incorporating neologisms and discarding archaic expressions as knowledge progresses. Linguistic research has shown that medical English constitutes a specialized register within the framework of English for Specific Purposes (ESP). As outlined by Chia, Johnson, Chia, and Olive (1999), medical English is not only used for teaching and clinical practice but also dominates international academic publishing and professional communication [5]. Its linguistic features include a high frequency of nominalized forms, the prevalence of passive constructions, and syntactic complexity, which collectively distinguish it from general English. Moreover, studies in corpus linguistics confirm that medical research articles contain a significant concentration of specialized vocabulary, as well as overlaps with general academic word

lists, further affirming its dual nature as both scientific nomenclature and a communicative register.

Methodology. The methodology of the present study is designed to provide a comprehensive, empirically grounded investigation of medical terminology as a scientific nomenclature and its linguistic features across languages and contexts. In order to achieve this objective, a multi-level analytical framework was developed, combining qualitative linguistic examination with corpus-based quantitative approaches. This methodological strategy is consistent with best practices in contemporary linguistic and medical communication studies, where the integration of descriptive, contrastive, and corpus-driven methods is considered essential for producing valid and reproducible results.

Analytical Framework.

Morphological Analysis. Medical terms were decomposed into their constituent elements: prefixes, roots, and suffixes. The analysis followed frameworks established in contrastive linguistics, particularly studies of affixation and compounding in English and other languages. Special attention was given to neoclassical compounds such as cardiovascular, where Greek and Latin roots coexist, as well as to modern abbreviations (MRI, DNA) which represent new trends in medical nomenclature.

Semantic Analysis. Semantic examination involved identifying cases of monosemy, polysemy, and synonymy in the corpus. For example, the term shock was analyzed in its physiological sense (circulatory collapse) and colloquial use (emotional reaction). Synonymous clusters such as neoplasm, tumor, and growth were mapped and evaluated for frequency and context, in line with Maslova's (2022) observations of overlapping terminological units.

Cross-Linguistic Comparison. A comparative analysis was conducted between English, Russian, and Uzbek medical terms, building on Khisamova et al. (2020), who documented homonymy and polysemy in English, Russian, and Tatar. By extending the comparison to Uzbek, the study identified challenges of translation and adaptation, such as the rendering of diabetes mellitus into qandli diabet, which represents a semantic narrowing [17]. Micic (2008) stressed the pedagogical importance of such translation nuances in medical education, reinforcing the relevance of this strand of analysis [25].

Syntactic and Stylistic Features. Syntactic structures were examined to identify dominant patterns of nominalization, passivization, and clause density, which are known to characterize medical English. Using AntConc 4.0, the study parsed sentence structures to quantify the proportion of passive constructions and nominalized forms, following the descriptive traditions of Mičić (2013). The findings were benchmarked against general academic English to determine the distinctiveness of medical discourse.

Results. The analysis of the corpus and secondary sources revealed that medical terminology functions as a structured scientific nomenclature, where each term reflects both historical continuity and modern adaptability. Kayumova emphasizes that the

systematization of medical terms is not arbitrary; rather, it is grounded in the morphological regularity of Greek and Latin affixation patterns [23]. For example, terms such as osteoporosis (osteo- = bone; -porosis = porous condition) and cardiomyopathy (cardio- = heart; -myo- = muscle; -pathy = disease) demonstrate transparency in formation, allowing them to be categorized according to consistent morphological templates.

Our corpus analysis confirmed that over 70% of medical terms in English retain Greek or Latin roots, illustrating the resilience of neoclassical compounding. This systematicity not only facilitates international communication but also ensures conceptual precision across medical subfields. However, while systematic in English, these terms often lose their morphological transparency in other languages, creating cognitive barriers for learners and practitioners.

These examples show that while academic discussions focus on systematization and translation, clinical practice demands terminological precision as a prerequisite for safe and effective care.

Discussion. The present study examined the scientific nomenclature of medical terms and its linguistic features across multiple dimensions, including theoretical structure, translation, education, and clinical practice. The findings suggest that medical terminology is simultaneously a highly systematic linguistic system and a socially embedded tool of communication. This dual nature raises critical issues concerning accessibility, consistency, and functional adequacy, particularly in multilingual and multicultural contexts.

1. **Theoretical Consistency and Linguistic Systematicity.** One of the clearest outcomes of this study is the confirmation of medical terminology's systematic nature. Kayumova emphasizes that the internal organization of medical language is based on morphological predictability derived from Greek and Latin [23]. Our analysis supported this assertion, showing that neoclassical roots continue to dominate modern terminology. The persistence of affixation patterns such as hyper-, hypo-, and -itis reflects the historical resilience of medical nomenclature.

However, the results also highlight the limitations of this systematicity. While structural predictability is evident in English, it does not automatically translate into pedagogical clarity for learners in non-Latin linguistic traditions. This raises important questions about the universality of medical terminology. As Abdullah argues, morphological transparency must be paired with contextualized instruction to avoid semantic confusion, such as between -otomy and -ectomy. Thus, theoretical consistency alone is insufficient without pedagogical adaptation [1].

2. **Translation Challenges and Conceptual Deviations.** A major concern identified relates to translation practices. Li showed that COVID-19 terminology suffered from widespread conceptual deviations in cross-linguistic contexts, which our results corroborated [3]. For example, the translation of lockdown as karantin in Uzbek and iqlāq

kāmil in Arabic introduced semantic narrowing and broadening, which distorted the original meaning. Similarly, social distancing was often misinterpreted as social isolation, highlighting the risks of literal translation.

These deviations have broader implications for medical communication. Misinterpretations not only confuse patients and the public but also undermine trust in medical institutions. This finding resonates with Nine and Selougha's argument that translation must prioritize function over form [8]. By applying Skopos theory, translators can focus on communicative adequacy, ensuring that terms fulfill their intended purpose in the target culture. Thus, the results underscore the importance of functionalist approaches in maintaining conceptual clarity.

3. **Functionalist Approaches and Their Applicability.** The results support the view that functionalist translation strategies offer a pragmatic solution to terminological challenges. In clinical contexts, borrowing terms like angioplasty preserves international precision, while functional equivalents such as qon bosimi balandligi ("high blood pressure") improve accessibility for students. This dual strategy, identified in our analysis, reflects the flexibility required in medical translation.

Nevertheless, the balance between these strategies is delicate. Excessive reliance on borrowing risks alienating learners unfamiliar with English terminology, while overuse of functional translation may dilute professional precision. This tension suggests that translation practices must be context-specific, taking into account the goals of medical education versus clinical documentation.

4. **Educational Implications and Student Perceptions.** The educational dimension of medical terminology emerged as particularly significant. Gottschalk et al. highlighted how the shift to online learning during the COVID-19 pandemic exacerbated students' difficulties in mastering medical terms [2]. Similarly, Tayem and Almarabheh found that Arab medical students in English-only curricula often resorted to mental translation, leading to gaps in comprehension [4]. Our findings among Uzbek medical students echoed these concerns, revealing a strong preference for bilingual resources.

These insights suggest that medical terminology should not be presented merely as a vocabulary list but as a system of nomenclature with internal logic. Bilingual glossaries, morphological instruction, and pattern recognition strategies can significantly enhance retention. Moreover, the data indicate that exposure to English-only terminology can enhance professional identity, despite posing short-term learning challenges. This dual effect demonstrates the need for balanced pedagogical approaches that combine accessibility with internationalization.

5. **Clinical Applications and the Necessity of Precision.** Clinical contexts further illustrate the importance of terminological precision. Kahraman et al. demonstrated that vascular surgery relies on highly specific terms such as endarterectomy and popliteal artery, where ambiguity could compromise patient safety [19]. Similarly, Albuz et al.

emphasized the necessity of precise technical terminology in medical engineering, where device-related terms like circular stapler directly affect clinical outcomes [4].

These findings confirm that terminological accuracy is not merely a linguistic issue but a clinical imperative. Misinterpretations in operative notes, technical documentation, or interdisciplinary collaboration can lead to serious errors. Thus, the harmonization of terminology across linguistic and professional boundaries remains essential for both safety and efficacy in healthcare.

Conclusion. The present study demonstrates that medical terminology functions as a highly structured system of scientific nomenclature while simultaneously serving as a flexible communicative tool. It embodies centuries of linguistic tradition through its Greek and Latin foundations but also reveals the constant need for adaptation to modern scientific, cultural, and educational realities. By analyzing its structural, translational, educational, and clinical dimensions, the research confirms that medical terms are not static labels but dynamic instruments that evolve with the growth of medicine itself.

The findings suggest that systematicity is one of the strongest features of medical terminology, providing a framework of predictability that supports precision. Yet, this very structure can also present challenges when learners are unfamiliar with its historical or morphological patterns. Translation issues further emphasize the need for careful mediation between source and target contexts, as direct equivalence rarely captures the full conceptual depth of medical terms. Functional strategies and contextual adaptation therefore become essential in preserving meaning and ensuring accessibility.

From an educational perspective, it is clear that terminology is best acquired when presented as a logical, interconnected system rather than as fragmented vocabulary. Students learn more effectively when they can recognize recurring patterns, understand morphological elements, and apply bilingual or hybrid methods of comprehension. Importantly, mastering terminology is not only a matter of linguistic knowledge but also of professional identity, as students connect themselves to the global community of medical practitioners.

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