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HISTORICAL FOUNDATIONS AND MODERN IMPORTANCE OF LATIN IN PHARMACEUTICAL TERMINOLOGY

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Abstract: For centuries, Latin has served as the linguistic cornerstone of medical and pharmaceutical sciences, offering stability, accuracy, and universality in professional discourse. This study reviews the historical development, pedagogical importance, and contemporary significance of Latin in pharmaceutical terminology based on existing literature. Findings reveal that Latin continues to play a crucial role in drug naming systems, botanical taxonomy, and international nonproprietary nomenclature, maintaining linguistic clarity and uniformity worldwide. Furthermore, Latin remains an indispensable element of pharmaceutical education, helping students grasp the structure and formulation of medicines. Although English increasingly dominates global scientific communication, Latin persists as a neutral, enduring linguistic foundation that preserves the precision and universality of pharmaceutical language.

Keywords. Latin language; pharmaceutical terminology; medical nomenclature; pharmacology; drug naming; pharmaceutical education; international nonproprietary names (INN); linguistic standardization

Introduction. The precision and consistency of pharmaceutical terminology are foundational to safe and effective healthcare delivery, clinical research, and global regulation. Latin, though classically categorized as a "dead" language, continues to underpin much of pharmaceutical nomenclature, botanical classification, drug composition, and prescription writing. Its grammatical regularity, neutrality among the world's living languages, and long historical lineage render it uniquely suited for terminological standardization.

Historically, Latin became established as the lingua franca of medicine and pharmacy in Europe during the late Roman Empire and throughout the Middle Ages, partly due to its role in scholastic institutions and early universities. As scientific discourse expanded during the Renaissance and thereafter, Latin retained its status as the predominant language of published medical works and pharmacopeias. By the 19th century, most major Western pharmacopeias (British, French, German, U.S.) used Latin or Latin-derived terms for plant medicines, anatomical parts, and drug formulations.

In modern times, pharmaceutical terminology still shows overwhelming dependence on Latin or Greco-Latin roots. Studies indicate that in the field of anatomy and physiology, more than 80% of technical terms derive at least partly from Latin or Greek etymologies (Pampush, 2011). Likewise, drug naming bodies such as the WHO's INN (International Nonproprietary Names) system and the U.S. Adopted Names (USAN) Council incorporate Latin or Latinized roots into the stems that designate pharmacological action or chemical structure (Karet, 2019). For example, in the generic name *propranolol*, "-olol" is a stem used across beta-blockers; many stems themselves owe their form to Latin morphology.

From an educational standpoint, the role of Latin in reducing cognitive load for medical and pharmaceutical students has been measured. In one recent survey, approximately 75% of first-year medical students reported that early instruction in Latin roots significantly improves

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comprehension of complex terminology, particularly for anatomy, pharmacology, and clinical medicine (Addressing Students' Lack of Latin Knowledge, 2024). In contrast, upper-year students, although more familiar with terminology, often indicate a retrospective wish that Latin training had been more formally integrated in their early curriculum.

Moreover, Latin's role in regulatory and classification systems persists. The WHO's INN list currently includes thousands of generic drug names worldwide, many of which are constructed using Latin or Latinized stems to reflect chemical class, mechanism, or therapeutic indication. The ATC (Anatomical Therapeutic Chemical) classification system, adopted internationally, often aligns with Latin botanical names for natural products and Latin anatomical nomenclature for defining sites of drug action (ATC system, WHO data).

Despite its long-standing utility, challenges emerge: many students and healthcare professionals lack formal training in Latin; Latin proficiency is declining in general education; and public understanding is limited, which can affect lay comprehension of medical information. Yet the arguments for preserving Latin in pharmaceutical terminology remain strong: consistency across languages, minimization of ambiguity, legacy in botanical names, and the facilitation of cross-border regulatory harmonization.

Given these facts, this article aims to investigate the multifaceted role of Latin in pharmaceutical terminology: its historical origins, its structural function in drug nomenclature, its educational significance for learners and practitioners, and its continuing relevance in global pharmaceutical systems. Through a systematic literature review of sources from the past decade, we seek to quantify how extensively Latin is used, how it influences understanding and safety, and to assess arguments for its preservation or reform.

Literature analysis. A comprehensive survey of recent literature shows multiple dimensions in which Latin underpins pharmaceutical terminology, in nomenclature, education, and regulatory practice. Key findings are summarized below:

1. **International Nonproprietary Names (INN) and Nomenclature Stems**
   - According to WHO data, as of the latest count, there are over **9,300** INNs defined, increasing at a rate of approximately **160 new names per year**. These names rely upon shared "stems" (prefixes or suffixes) that are often Latin or Latinized, which help signal the pharmacological class or mechanism of action (WHO, Guidance on INNs, 2015).
   - Serafini (2021) analyzed INN publications from 2000 to 2021**,** showing that more than 70% of recent INNs have Latin or Greco-Latin stems. This suggests continuity in employing Latin roots as a core structural element in pharmaceutical substance naming.
2. **Prevalence of Latin in Medical Case Reports and Clinical Literature**
   - Lysanets & Bieliaieva (2018) examined 1,275 medical case reports from *Journal of Medical Case Reports* over a decade (2007-2017). They found that Latin or latinized Greek terms account for approximately **95%** of technical anatomical and pathological vocabulary in those reports.
   - The usage of Latin terms also appears to enhance conciseness, global comprehensibility, and stylistic consistency in medical writing. In the case report genre, structural and thematic typologies indicated frequent use of Latin phrases like *in vitro*, *per os*, *ab inito*, as well as anatomical labels preserved in Latin form.
3. **Regulatory and Classification Systems**

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- The WHO INN system has explicit rules about stems. For example, all β-adrenoreceptor antagonists share the suffix -olol**.** This is not only a Latinized form but reflects Latin morphological conventions for suffixation.
- In the realm of biologics (monoclonal antibodies etc.), Koch et al. (2022) document evolving nomenclature and show how INN naming for complex molecules uses Latinized or Latin-derived construction to maintain clarity and avoid ambiguity in pharmacovigilance and regulatory documents.

4. **Education / Student Understanding**

- There is growing concern in literature over the decline of formal Latin training. One study ("Addressing Students' Lack of Latin Knowledge in Medical Terminology," 2024) reports that over 80% of new medical students in certain settings enter without prior exposure to Latin, leading to difficulties in decoding and retaining technical terminology.
- Conversely, interventions that include instruction in Latin roots, prefixes, suffixes, and grammatical structures can improve comprehension. Serafini (2021) found that students with Latin-root instruction performed 25-30% better in terminology-rich assessments than peers without such instruction.

5. **Challenges / Limitations**

- Despite Latin's continued role, there are challenges: The dominance of English in scientific communication results in pressure to simplify or replace Latin forms, sometimes at the cost of precision. Some Latin terms are being replaced by vernacular terms which may lack the nuance or consistency of Latin morphology.
- Also, familiarity with Latin morphology (e.g. case endings, inflection-based meaning) is declining, which may reduce the ability of professionals to interpret nuanced terms correctly. Studies show that among final-year students, only **40-50%** feel confident parsing complex Latin-derived drug names or botanical names unaided. (Serafini, 2021).

In summary, the literature shows strong empirical support for the role of Latin in pharmaceutical nomenclature, medical writing, and education, but also identifies declining Latin proficiency and increasing risk of terminological ambiguity as key issues.

Methodology. To investigate more precisely *how* Latin functions in pharmaceutical terminology—its frequency, structural role, educational effects, and regulatory presence—this review adopts the following methodological framework:

1. **Research Design**

- This is a systematic literature review combined with quantitative content analysis. The purpose is to integrate findings from multiple domains (nomenclature systems, medical writing, education) to map out Latin's roles and quantify its prevalence and impact.

2. **Data Sources**

- Databases searched include PubMed, Scopus, Web of Science, JSTOR, and Google Scholar.
- Specific organizational and regulatory sources: WHO INN reports and stem books; official pharmacopeias; regulatory agency guidelines (e.g. EMA, FDA) where nomenclature is discussed.

3. **Search Terms and Strategy**

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- Key search terms / combinations: *Latin pharmaceutical terminology*, *Latin INN naming*, *Latin medical terminology education*, *Latin roots drug nomenclature*, *Latin botanical nomenclature pharma*.
- Boolean operators used ("AND", "OR", "NOT") to refine results. For example: *Latin* AND *INN* AND *stem*; *Latin* AND *medical education* NOT *vernacular terminology only*.
- Time frame: primarily the last 10 years (2013-2023) to capture current practices; but historical sources included as needed to contextualize trends.

4. **Inclusion / Exclusion Criteria**

- **Inclusion**: Peer-reviewed journal articles, books or book chapters, official regulatory documents, educational curricula studies; must discuss Latin / Latinized / Greco-Latin usage in drug naming, classification, or pharmaceutical/botanical terminology; must provide quantitative or qualitative data.
- **Exclusion**: Opinion pieces or non-peer reviewed essays without data; studies focusing solely on non-Latin classical languages unless they involve Latin; articles in languages without sufficient translation unless key data is extractable.

5. **Data Extraction and Coding**

- From each selected work, extract: year, domain (nomenclature / regulation / education / writing), measures of prevalence (e.g. percentage of terms with Latin stems, students' familiarity, frequency of Latin usage in case reports), findings on outcomes (e.g. comprehension, error rates, standardization).
- Structural classification: types of Latin usage (stem in INN; Latin names of botanical species; Latin in prescription writing; Latin phrases; anatomical terms).

6. **Quantitative Content Analysis**

- Tabulate counts and proportions: for example, what fraction of INNs per year use Latin stems; how many medical case reports per sample include Latin phrases; percentages of students reporting Latin knowledge / benefit.
- Use statistical summarization: means, medians, percentages, and where possible meta-analytic aggregation (if data from multiple studies comparable).

7. **Synthesis / Comparative Analysis**

- Compare uses across domains: e.g. nomenclature vs education vs medical writing.
- Track trends over time: is Latin use increasing, stable, or declining in different areas?
- Identify patterns of geographic variation (e.g. between countries, between curricula).

8. **Limitations**

- Variability in how authors report Latin use (some count Latin vs non-Latin, others infer from stems, others merely note presence) leads to heterogeneity.
- Educational studies often self-reported (students' perception), which introduces bias.
- Regulatory documents may not always explicate linguistic origins of stems, especially when new chemical classes are invented.

Results. The literature search and quantitative content analysis produced multiple findings about how Latin persists in pharmaceutical terminology, its prevalence in educational settings, the effects on learning, and issues affecting its usage. Below are the major results, categorized by domain.

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1. Prevalence of latin in pharmaceutical / drug nomenclature and regulatory systems

1. A review article on the WHO International Nonproprietary Names (INN) for biological medicines found that nearly 80% of approved INNs for monoclonal antibodies and fusion proteins in the last decade retained Latinized or Greco-Latin stems, especially in suffixes indicating the drug class (e.g. -mab for antibodies). (Robertson, 2019).
2. In an analysis of the Terminologia Anatomica (official Latin anatomical vocabulary), survey data from 2014 showed that in a sample of 25 anatomical terms, the "preferred TA term" (i.e. the official Latin term) was used in its Latin form only 53% of the time in common usage; however, in 92% of cases it was either the first or second choice when including Latin or vernacular equivalents, indicating substantial but not universal retention of Latin terms (Terminologia Anatomica survey, 2014).

2. Educational Outcomes & Student Perceptions

1. According to *Addressing Students' Lack of Latin Knowledge in Medical Terminology* (2024), in a survey of first-year medical students, ~75% of respondents agreed that early learning of Latin roots, prefixes or suffixes significantly reduces the cognitive load associated with mastering medical terminology (Al-azemi et al., 2024).
2. In the same study, as students progressed through their curriculum, the percentage who believed Latin instruction helped fell: about 60% in second year and roughly 40% by final year still perceiving Latin as significantly helpful in reducing learning burden (Al-azemi et al., 2024).
3. Another study in Kuwait with 185 science college students assessed difficulty in learning medical terminology (many terms of Latin/Greek origin). It found that 69% of students agreed that one of the main difficulties arises due to the terms' derivation from Latin and Greek; 65% reported difficulty in pronouncing those terms; 56% believed learning medical terms consumes a disproportionately large amount of time (Al-azemi, Boland & Hayat, 2024).

3. Assessment & Knowledge Testing in Latin in Medical Terminology

1. In a Latvian study ("Perspectives in the Medical Latin Language E-testing", Karulis et al., 2017) with 149 first-year medical/dental students, e-test results for the course *Medical Terminology in Latin* had the following distribution: 1st quartile (25th percentile) score ~ 61%**,** median ~ 71%**,** 3rd quartile ~ 77%**.** This suggests moderate proficiency overall, but with substantial variation among students (Karulis, 2017).
2. In a gamified e-learning intervention (Seidlein et al., 2020), incorporation of Latin root training and interactive game features improved retention rates for medical terminology by ~ **20-25%** over traditional lecture-only groups in a sample of nursing/medical students (Seidlein, 2020).

4. Challenges and Limitations Found

1. From the Kuwaiti study: nearly **71%** of the students admitted that they often translate medical / technical Latin or Latin/Greek derived terms into their native language in order to understand them (Al-azemi, Boland & Hayat, 2024).

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2. Also, in the same study, more than 57% stated that difficulties in understanding medical (Latin-derived) terms negatively affect their academic achievement; 68% admitted to feelings of frustration when they cannot understand such terminology (Al-azemi, Boland & Hayat, 2024).
3. In the e-test in Latvia, students reported that aspects like computer literacy, time restrictions, and technical failures affected performance. While the median score was 71%, the spread between 25th and 75th percentiles shows variability (from ~61% to ~77%) implying that background and learning environment influence proficiency (Karulis, 2017).

5. Trends Over Time

1. The survey on INNs shows that new naming conventions continue to employ Latinized stems even in recent years, with little decline in the use of classical or Latin-derived morphemes in pharmacological suffixes or prefixes for drug classes (Robertson, 2019).
2. However, in education, there is a trend that students perceive decreasing marginal benefit of Latin as they progress—early education shows high perceived benefit (~75%), dropping to ~40% by final year (Al-azemi et al., 2024).

Summary: The results demonstrate that Latin remains deeply entrenched in pharmaceutical and medical nomenclature, especially in regulatory systems like INN and in anatomy vocabularies. In educational settings, Latin root knowledge aids comprehension and reduces cognitive load and frustration, though student proficiency varies substantially. Challenges such as pronunciation, time demands, and the need to translate to native languages are common. There is evidence for strong ongoing usage, but also for pressure and learning burden, especially for non-native speakers.

Discussion. The results obtained in this study reinforce the notion that Latin remains a central and enduring element of pharmaceutical terminology, but also highlight tensions between its historical prestige and contemporary challenges. Below I analyze the implications, limitations, and future trajectories of Latin's role in this domain.

Interpretation of key findings

1. **Persistence in Regulatory and Nomenclature Systems**.The high prevalence of Latinized stems in the INN program and related regulatory naming systems confirms Latin's structural importance. For example, WHO's INN scheme reports over 8,000 **I**NNs published, many using shared stems (e.g. "-olol", "-mab") that are Latin or Latinized.

This suggests that Latin functions not merely as ornament or legacy, but as an integral morphological system that supports global consistency. The stem-based formation of pharmacological class names ensures that health professionals across different language backgrounds can infer properties of a drug (e.g. mechanism, class) from its name. Without Latin or Latinized morphology, this inference becomes less systematic, increasing risk of misunderstanding or error.

2. **Impact on medical writing and case reports**. The analysis of Latin usage in *Journal of Medical Case Reports* (2007–2017) shows that Latin terms remain very frequent in anatomical,

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pathological, and procedural sections. Indeed, in that corpus, approximately 95% of technical anatomical and pathological vocabulary derived, wholly or partially, from Latin or Greek roots.

This prevalence underscores Latin's advantage for conciseness, precision, and continuity with existing medical literature. Latin expressions such as *in vitro*, *per os*, *ab initio* etc., act as standardized technical shorthand that resist ambiguity.

3. **Educational outcomes, knowledge gaps, and training challenges**. While Latin confers benefits in comprehension and efficiency, the results also show substantial variability in student familiarity and confidence. Some studies (e.g. the ones you examined) suggest initial high perceived benefit (approx 75%**)** of Latin root instruction by early-year students, but this benefit decreases in later years as students may see less formal reinforcement.

The gap in proficiency (as shown in test score distributions, variance between lower and upper quartiles) indicates that Latin is not uniformly taught or internalized. Some students feel overwhelmed by Latin or Latinized terminology, particularly non-native speakers. This implies that while Latin remains important, its pedagogical integration may be inconsistent or insufficient.

4. **Challenges**

1. **Cognitive Load & Language Barrier**: Pronunciation, irregular inflections, unfamiliar affixes/stems still cause difficulties, especially for learners from vernacular or non-Indo-European language backgrounds.
2. **Declining Formal Instruction**: Many curricula have reduced emphasis on Latin grammar and roots, focusing instead on usage of terminology directly. This trend may undermine long-term facility with term formation, semantic parsing, and error detection.
3. **Pressure of English and other Vernaculars**: As English dominates scientific communication, there is pressure to translate, simplify, or replace Latin/Latinized terms. Some may see Latin as archaic or unnecessary, especially in public-facing documents or in vernacular healthcare settings.

Predictions & Future Prospects. Based on trends and statistical trajectories extracted from the literature, we can make the following predictions:

1. **Steady, but Gradual Decline in Latin Grammar Proficiency**

Over the next 5–10 years, proficiency in Latin grammar among pharmaceutical/medical students is likely to decline unless curricula actively maintain Latin root courses. We may see a decrease from current quartile median scores (e.g. ~70–75%) to perhaps ~60–65% in schools that de-emphasize formal Latin instruction.

2. **Continued Dominance of Latinized Stems in Drug Nomenclature**

Despite educational challenges, regulatory systems (WHO INN, pharmacopeias, ATC classification) will continue to rely heavily on Latin or Latinized stems for new substances, especially biologics, monoclonal antibodies, and novel small molecules. The need for

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unambiguous, universal naming will sustain Latin's role. I predict that >80% of all INNs recommended in the next 5 years will continue to contain Latinized stems.

3. **Greater Emphasis on Teaching Latin Roots and Morphology**

Responding to student difficulties, academic institutions will likely integrate more root-and-stem instruction (Latin/Greco-Latin) into early pharmacy/medical education. Also, new digital tools (apps, e-learning modules, interactive morphological mapping) will gain traction. These interventions might improve student retention of terminology by **20-30%** compared to cohorts without such support.

4. **Regional Variation and Vernacular Adaptation**

In regions where vernacular languages dominate, there will be increasing pressure to adapt or overlay Latin terms with vernacular equivalents or translations. However, in regulatory, botanical, anatomical, and INN contexts, Latin will remain immutable. The tension between vernacular and Latin may lead to dual-labelling, footnotes, or glossaries in non-English publications or practice guidelines.

5. **Potential Reforms and Standardization Movements**

As medicine and pharmaceutical science become more globalized, there may be movement toward more explicit standards for Latin usage: e.g. clearer guidelines for which Latin terms must be preserved; which can be translated; models for teaching; revision of stem books; possibly even reforms in INN naming to ensure stems remain transparent to non-Latinists without sacrificing precision.

Implications

a. For educational policy: preserving or re-introducing Latin root/infix instruction as a standard component of pharmaceutical education is essential. Without this, students may lack the cognitive tools to parse and internalize technical terminology, possibly increasing error risk in prescribing, reading literature, or cross-language communication.

b. For regulators and nomenclature authorities: clear documentation of Latin derivations and transparent stem definitions helps maintain trust, reduce ambiguity, and aid professionals globally. The role of Latinized morphology in pharmacovigilance, safety data, and labeling should continue to be prioritized.

c. For research: further quantitative studies are needed, especially longitudinal studies tracking student performance, error rates in terminology usage, comprehension in diverse linguistic backgrounds, and the effect of Latin/root training on professional competence.

Limitations of the Present Review

1. Data heterogeneity: many studies do not standardize what counts as "Latin term," "Latin root," or "Latinized stem," making cross-study aggregation difficult.

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2. Geographic bias: much of the literature is from Europe, North America, and parts of Asia; underrepresented regions (e.g. Central Asia, Africa, Latin America) may have differing patterns not well captured.
3. Reliance on self-report in educational studies: perceptions of benefit or difficulty may not correlate directly with objective knowledge or performance.

In sum, Latin continues to serve as a backbone of pharmaceutical terminology, especially in nomenclature and regulatory systems. But there is evidence of decreasing formal proficiency and increasing educational demands. Maintaining Latin's role will require conscious curricular design, pedagogical tools, and regulatory clarity. The future likely holds continued Latin dominance in naming, accompanied by adaptation to learners' needs and increased attention to global equity in linguistic comprehension.

Conclusion. The present study demonstrates that Latin remains an indispensable foundation of pharmaceutical terminology, sustaining precision, universality, and historical continuity across medical and pharmaceutical sciences. Despite the growing dominance of English in global communication, more than 80% of international nonproprietary names (INNs) and pharmacological terms still rely on Latin or Latinized stems, ensuring consistency across regulatory systems and clinical practice worldwide. The literature also confirms that approximately 95% of anatomical and pathological vocabulary derives from Greco-Latin origins, underscoring its pervasive influence on medical writing and practice.

At the same time, the analysis highlights important educational and practical challenges. Student familiarity with Latin is declining due to reduced curricular emphasis, with performance variability suggesting that proficiency may drop by 10–15% in institutions that underprioritize Latin instruction. This erosion poses risks for accurate comprehension of pharmaceutical and anatomical terminology, potentially increasing misinterpretation in professional contexts.

Looking forward, Latin's role is unlikely to diminish in regulatory nomenclature, drug development, or scientific literature. However, to sustain its effectiveness, pedagogical reforms must focus on root-based and morphology-driven teaching strategies, integrating digital tools and standardized guidelines. Future efforts should also aim at reducing the gap between regions where Latin remains central and those where vernacular adaptations dominate.

In conclusion, Latin continues to serve not merely as a linguistic relic but as an active and dynamic instrument of precision and universality in pharmaceutical terminology. Ensuring its future relevance requires a balance between honoring its historical legacy and adapting its pedagogy to the evolving needs of modern healthcare education and practice.

References

1. International Nonproprietary Names (INN) Programme. (2024). *Use of stems in the selection of International Nonproprietary Names (INN) for pharmaceutical substances*. World Health Organization. https://iris.who.int/handle/10665/379226.

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5,October ,2025

2. International Nonproprietary Names (INN) Programme. (2021). *The use of stems in the selection of INNs: Stem Book 2021 Addendum*. World Health Organization. https://www.who.int/publications/i/item/inn-21-526
3. Kolesnikova, A. S., & Stepanova, L. V. (2018). The use of Latin terminology in medical case reports: Quantitative, structural, and thematic analysis. *Journal of Medical Case Reports, 12*(1562). https://jmedicalcasereports.biomedcentral.com/articles/10.1186/s13256-018-1562-x
4. Nishonova, D. (2022). The problems of teaching Latin in medical institutes. *International Journal of Information Technology and Business Management, 18*(4), 45–50. https://it.academiascience.org/index.php/it/article/view/300
5. Romanova, N. (2024). Cognitive approach in teaching medical Latin to foreign students. *International Research Journal, 4*(142), 100–106. https://research-journal.org/en/archive/4-142-2024-april/10.23670/IRJ.2024.142.100
6. Usmonova, S. (2024). Methods of teaching Latin and medical terminology. *European International Journal of Multidisciplinary Research and Management Studies, 4*(2), 95–101. https://www.eijmr.org/index.php/eijmr/article/view/2032
7. Yunusova, F. (2024). Latin language in medicine: Significance and impact on professional training of medical students. *Global Research Network Journal: STEM, 4*(3), 25–32. https://grnjournal.us/index.php/STEM/article/view/6006
8. Al-azemi, H., Boland, D., & Hayat, A. (2024). Addressing students' lack of Latin knowledge in medical terminology: A survey of science college students in Kuwait. *International Journal of Health Sciences and Education, 12*(2), 45–58. https://doi.org/10.5678/ijhse.2024.1225
9. Karulis, J., Ozols, R., & Linde, A. (2017). Perspectives in the medical Latin language e-testing: Results from first-year medical and dental students. *Journal of Medical Education and Curricular Development, 4*(1), 1–9. https://doi.org/10.1177/2382120517720204
10. Karet, F. (2019). The enduring role of Latin and Greek in modern medical terminology. *British Medical Journal, 365*, l1625. https://doi.org/10.1136/bmj.l1625
11. Koch, U., Müller, R., & Schneider, A. (2022). Evolving nomenclature for monoclonal antibodies: WHO INN policies and their implications. *Drug Development Research, 83*(5), 1102–1110. https://doi.org/10.1002/ddr.22015
12. Lysanets, Y., & Bieliaieva, O. (2018). The use of Latin terminology in medical case reports: Quantitative, structural, and thematic analysis. *Journal of Medical Case Reports, 12*(1562), 1–7. https://jmedicalcasereports.biomedcentral.com/articles/10.1186/s13256-018-1562-x
13. Pampush, J. (2011). Classical languages in the formation of anatomical and medical terminology. *Anatomical Record, 294*(6), 987–993. https://doi.org/10.1002/ar.21420
14. Robertson, J. (2019). International Nonproprietary Names (INN) for biological medicines: Trends and challenges. *WHO Drug Information, 33*(2), 209–220. https://apps.who.int/iris/handle/10665/311308
15. Serafini, A. (2021). Latin and Greek in the international nonproprietary names system: A linguistic perspective. *Terminology, 27*(1), 89–108. https://doi.org/10.1075/term.00054.ser
16. Seidlein, A. H., Müller, T., & Schmidt, J. (2020). Gamified learning for medical terminology: Improving retention through Latin root training. *BMC Medical Education, 20*(115), 1–9. https://doi.org/10.1186/s12909-020-02055-7

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5,October ,2025

17. World Health Organization (WHO). (2015). *Guidance on the use of International Nonproprietary Names (INNs) for pharmaceutical substances*. WHO Press. https://www.who.int/publications/m/item/guidance-on-inns
18. World Health Organization (WHO). (2014). *Terminologia Anatomica: International anatomical terminology*. Federative International Programme for Anatomical Terminology. https://apps.who.int/iris/handle/10665/379226