

COMPOUND ENGLISH ANATOMICAL TERMS AND THEIR LATIN EQUIVALENTS IN THE TEXTBOOK *HUMAN ANATOMY (VOL. I)*

Nijolė Litevkienė

Šiauliai State University of Applied Sciences

Abstract. The article presents the analysis of compound English and Latin anatomical terms and the analysis of their specific configurations. The oldest language that played a very important role in the development of medicine in Europe was Greek. English medical terminology developed from medieval Latin terminology, which had absorbed a developed Greek terminology. Modern anatomical terminology is based on centuries-old tradition and constantly revised knowledge. Most anatomical and clinical terms used in medicine today are Latin or Latinized Greek words, the origin of which can be traced back to the 5th century B.C. In the textbook "Human Anatomy", M. Prives, V. Bushkovich, and N. Lisenkov offer a progressive view of descriptive, evolutionary, functional, and practical anatomy. Medical terms in the textbook can be basically divided into one-word and multiple-word terms.

Anatomical terminology is the foundation of medical terminology, so it is extremely important for physicians and scientists worldwide to use uniform terms for each anatomical entity.

Medical terms in the textbook can be basically divided into one-word and multiple-word terms. One-word terms can be simple (underived) words, derived words, compounds, or a combination of derived and compound words. Compound anatomical terms can consist of two-five words. This article focuses on the comparative structural and semantic analysis of the anatomical terms of Latin and English languages.

The study reveals some significant coincidences and differences between two-word and three-word Latin and English anatomical terms and their frequency of usage. One of the terminologies of the fields of medical science is analysed using descriptive and comparative methods. A descriptive-analytical method was employed to perform quantitative and qualitative (of specific configurations) analyses.

Keywords: English anatomical terms, Latin anatomical terms, compound anatomical terms, configurations.

Introduction

The research subject is English and Latin compound anatomical terms. The paper refrains from analysing one-word anatomical terms, as they make up only an insignificant part of anatomical terminology.

The article aims to compare syntagmatic and paradigmatic relationships of compound two-word and three-word Latin anatomical terms and their English equivalents in the aspects of coincidence and difference.

To achieve that aim, the following objectives are set:

- to discuss English and Latin compound two-word and three-word anatomical terms according to the diversification of elements;
- to analyse the aspects of coincidence of English and Latin two-word and three-word anatomical terms and their structural groups;
- to investigate the difference between English and Latin two-word and three-word anatomical terms and their structural groups;
- to identify the trends of the frequency and usage of structures of English and Latin compound two-word and three-word anatomical terms.
- to systematise diversification aspects of elements of English and Latin terms.

One of the terminology banks of the fields of medical science is analysed using descriptive and comparative methods. A descriptive-analytical method was employed to perform quantitative and qualitative (of specific configurations) analyses. The quantitative analysis (of elements of English and Latin compound anatomical terms) and qualitative analysis (of specific configurations) were performed using a descriptive-analytical method. The article analyses the terminology of one of the fields of medical science – anatomical terminology in the textbook *Human Anatomy* (1985) by M. Prives, V. Bushkovich, and N. Lisenkov. The textbook on human anatomy by M. Prives, V. Bushkovich, N. Lisenkov under the general editorship of prof. M. Prives provides data on anatomical science and offers a number of advantages over other textbooks. *Human Anatomy* offers a progressive view of descriptive, evolutionary, functional, and practical anatomy. The textbook approaches the human organism both analytically, according to organs and systems, and synthetically, as a discrete unit with close ties to the environment, especially to society. The book also discusses the impact of social factors, including extreme social conditions, on the structure of the human organism and includes a section on new trends in anatomical science under investigations by Prives. The textbook also contains information on the study of X-ray anatomy, the anatomy of the living

human being. The textbook is available both for the traditional view of anatomy as the science of the human body structure and for the presentation of anatomy as the science of the natural laws regulating the structure and development of the human organism in relation to the environment. Anatomy is thus seen not as a stagnant university course but as a progressive science with important prospects.

Evolution of Latin anatomical terminology

The word *term* is Latin by origin (“terminus”) and means “a limit, a boundary”. The main function of a term is to denote exactly and in a full and concrete form some conception in the field of science, technology, etc. Each scientific notion has its definition, which explains its essence of it. For example, a non-specialist will say that *a tablet* is a drug, round in form, bitter or sweet, and so on. On the other hand, a specialist will define *a tablet* as a scientific term, i.e., “A tablet is a solid dosage drug form obtained by pressing and forming a special mixture of medical and additional substances”.

Terminology is a system of concepts. It is a combination of names, words, and combinations of words used to denote exactly and specifically scientific notions in the system of concepts of a given science. The vast subsystems of terms within the medical terminology are 1) the Terminology of Anatomy and Histology, the International Anatomico-Histological Nomenclature; 2) the Clinical Terminology (general medical terminology), which unites the terminologies of sciences concerned with the prevention, diagnostics, and treatment of diseases or pathological conditions; 3) The Terminology of Pharmacy including the terminologies of the sciences concerned with the exploration, production, and testing the effect of medical substances and drugs (Kostromina, 2007).

International medical terminology has a long, nearly 2500-year-old history. Each language of each nation that has contributed to the development of medicine has left indelible-unchangeable traces in modern medical English, too. The oldest language that played a very important role in the development of medicine in Europe was Greek. Thanks to the high level of medical schools, which existed for a long time after the decline of the Macedonian Empire, Greek was the language of doctors in Ancient Rome from the beginning to the fall of the Roman Empire. Roman rulers, to strengthen the power and prestige of the Empire, focused their attention on military, governmental, and engineering problems. When a plague outbreak burst out in Rome in 293 B.C., the Romans called for doctors from Greece. In the beginning, the Romans had little confidence in the doctor’s job;

they even underestimated it. But there was a gradual change after the arrival of famous doctors, such as Soranos, Rufus, Galenos and others, into Rome. From approximately the 1st century B.C., medicine developed successfully in Rome. It was not only doctors but also writers such as Aulus Cornelius Celsus who were interested in medicine. It was a long time before ordinary Romans considered it worthwhile to devote their energies to such a socially undervalued, little appreciated, and underpaid activity with a very low profit for a long time. The most important task for Roman doctors was to collect and arrange all available knowledge about treatment (Dzukanova, 2002).

It is estimated that about three-fourths of medical terminology is of Greek origin. The main reason is that the Greeks were the founders of rational medicine in the golden age of Greek civilisation in the 5th century B.C. The Hippocratic School and, later on, Galen (the Greek from Asia Minor who lived in Rome in the 2nd century A.D.) formulated the theories which dominated medicine up to the beginning of the 18th century. The Hippocratics were the first to describe diseases based on observation, and the names given by them to many conditions are still used today, for example, arthritis, nephritis, pleuritis (pleurisy). A second reason for a large number of Greek medical terms is that the Greek language is quite suitable for building compound words. When new terms were needed, with the rapid expansion of medical science during the last centuries, Greek words or Latin words with Greek endings were used to express new ideas, conditions, or instruments (Laszlo, 2013). The new words follow the older models so closely that it is impossible to distinguish the two by their forms.

In the modern era when English is the world language, the fact that interference of English in the modern language of medicine is getting more powerful cannot be denied. The latest research results are published mostly in English, and new medical terms for diseases, laboratory and investigation procedures are in English. Anatomical terms remain in their original form. Despite the tendency of English to be the new “lingua franca” of medicine, English medical terminology is strongly rooted in Latin. In other words, medical English is Latinized. The latest revision of anatomical terminology, “Terminologia Anatomica” (1998), is in Latin, serving as a basis for national versions, including English. Modern anatomical terminology is based on centuries-old tradition and constantly revised knowledge. Clinical medicine has not finished its development yet, and there are many questions for it to answer regarding the aetiology of existing and new diseases (Bujalková, 2018). The names of diseases were formed empirically in various times and places;

therefore, clinical terminology is not so uniform. Besides, clinical subjects continue to develop, so their knowledge must be continually revised.

One of the most common linguistic phenomena is the occurrence of different forms of influence of one language upon another. It almost always refers to living languages that are still in their natural development, or at least the language which is influenced is a living one. A unique phenomenon, a significant effect of modern English upon a dead language, Latin, occurred at the turn of the 20th century. Latin lost its role as a national language with the demise of the Roman Empire. However, it was still a common language of the Roman Catholic Church, European politics, and academic activity. Since the end of the Renaissance and a concomitant increase in the role of national languages, Latin was no longer used for interpersonal communication in academic circles and international relations. Latin had been a dead language for at least two centuries before it disappeared as the language of university instruction of medicine and theology, the last two professional fields taught in Latin at European universities (Kuchar, 2016). Even though Latin was removed from academic instruction in the first half of the 19th century, the language was used in European medicine for describing diagnoses and medical procedures.

While Latin dominates in medical records and communication among doctors, English is mostly used in doctor-patient communication and as a language of international cooperation. Therefore, medical English is taught in relation to Latin. We see advantages in the parallel teaching of Latin and English in the first year of study at our faculty because students can easily combine their knowledge, compare differences in word formation and adapt the terminology of English-speaking professionals.

In medical terminology, two completely different phenomena can be observed: a very precisely worked-out, internationally standardised anatomical terminology and a quickly developing clinical terminology of all medical branches, characterised by certain terminological chaos. The main cause of this phenomenon is the rapid development of scientific knowledge and a need to name new devices, diseases, symptoms, etc., promptly. All attempts to unify clinical medical terminology internationally have been unsuccessful until now (Bujalková, 2018).

The first attempt to create a unified international classification of diseases was made in the 19th century.

The extensive borrowing of words from Latin and Greek into English that began about 1500 A.D. continued for hundreds of years and continues to this day. New advances were made in the field of

Medicine and Science during and after the Renaissance (and continuing up to the present day), and new words were needed to describe those discoveries and inventions. Medical scientists turned to the early Greek and Roman physicians, especially Hippocrates, Galen, and Celsius, and borrowed words from their medical treatises. Latin, Greek and Latinized Greek medical terms penetrated into English medical terminology in various forms.

Another characteristic of medical terminology is that it consists of numerous words from everyday speech whose basic meaning has been extended to medical uses. The challenge for the translator is to spot these terms as having a specific medical meaning. A well-known commonly used word with a specific medical meaning is 'history', referring to the time before the patient's introduction to medical care and its German equivalent Krankengeschichte. An interesting use of language is the phrase 'past medical history'. In daily speech, 'past history' would appear redundant. In a medical context, however, 'past medical history' has a specific meaning, referring to the history of previous illnesses as opposed to the 'history of the present illness', terms that may be translated into German as Vorgeschichtefrüherer Krankheiten and Vorgeschichte der augenblicklichen Erkrankung (Berghammer, 2006).

Medical terms can be basically divided into one-word and multiple-word terms. One-word terms can be simple (underived) words, derived words, compounds, or a combination of derived and compound words. The second most productive type of word formation is compounding. A compound word is a fixed expression made up of more than one word, e.g., human being, blood donor, hay fever (Dzukanová, 2013).

English and Latin Anatomical Terms in the Textbook *Human Anatomy*

The textbook has been published four times in Spanish for use in Latin America (Prives et al., 1985).

The study is based on 695 English anatomical terms and 695 Latin anatomical terms (a total of 1390 terms). Compound anatomical terms are divided into two-word, three-word, four-word, and five-word terms. The diversity of the number of elements of compound terms is presented by the formula $f^1 (t_1 \dots t_n)$, where $n = 2$, $n = 3$, $n = 4$, and $n = 5$. The terms found also include repetitive the same Latin terms whose grammatical configurations of English equivalents are different, as well as a part of long compound anatomical terms that are like a kind of explanation of the concepts (Litevkienė, 2006).

In terms of origin, terms are different. They can be formed on the basis of the lexicon of another language: *bone marrow* – *medulla osium* (HA93); *simple joint* – *articulatio simplex* (HA122), *breast bone* – *sternum* (HA150), *true ribs* – *costae verae* (HA150), *floating ribs* – *costae fluctuantes* (HA150), *greater wings* – *alaemajores* (HA166), *lesser wings* – *alaeminores* (HA166), *teeth sockets* – *alveoli dentales* (HA187), *greater horns* – *cornuamajora* (HA189), *lesser horns* – *cornuaminora* (HA189), *nose cavity* – *cavumnasi* (HA199), *shoulder joint* – *articulatiohumeri* (HA218), *elbow joint* – *articulatiocubiti* (HA224), *wrist joint* – *articulioradiocapea* (HA232), *knee cap* – *patella* (HA248), *hip joint* – *articulatiocoxae* (HA249), *knee joint* – *articulatio genus* (HA256), *long head* – *caput longum* (HA336), *simple glands* – *glandulaesimplices* (HA389), *muscular coat* – *tunica muscularis* (HA390), *teeth* – *dentis* (HA395), *gums* – *gingivae* (HA398), *gal bladder* – *vesicafellea* (465), *right lung* – *pulmodexter* (HA515), *left lung* – *pulmo sinister* (HA515), *womb* – *uterus* (HA563). They can be borrowed (Latin and ancient Greek languages are mostly used): *vertebral column* – *columnavertebralis* (HA131), *lumbar vertebrae* – *vertebrae lumbales* (HA135), *sacral tuberosity* – *tuberositassacralis* (HA137), *coccygeal vertebrae* – *vertebrae coccygeae* (HA138), *jugular process* – *processusjugularis* (HA165), *oval foramen* – *foramen ovale* (HA167), *frontal squama* – *squamafrontalis* (HA176), *frontal sinus* – *sinus frontalis* (HA177), *mental tubercle* – *tuberculummentale* (HA187), *squamous suture* – *suturasquamosa* (HA190), *lateral ligament* – *ligamentumlaterale* (HA191), *superior orbital fissura* – *fissuraorbitalis superior* (HA193), *coronal suture* – *suturacoronalis* (HA195), *anterior cranial fossa* – *fossa cranii anterior* (HA197), *humeral condyle* – *condylushumeri* (HA218), *pubic tubercle* – *tuberculumpubicum* (HA239), *lateral inguinal fossa* – *fossa inguinalislateralis* (HA312), *falciform margin* – *margofalciformis* (HA373), *vallate papillae* – *papillae vallatae* (HA411), *caudate process* – *processuscaudatus* (HA463), *parietal pleura* – *pleura parietalis* (HA516). Finally, they can be mixed or hybrids: *auricular surface* – *faciesauriculares* (HA137), *clavicular notch* – *incisuraclavicularis* (HA150), *occipital bone* – *osoccipitale* (HA163), *temporal bone* – *ostemporale* (HA169), *cerebral surface* – *faciescerebralis* (HA169), *sagittal border* – *margosagitalis* (HA175), *palatine grooves* – *sulci palatini* (HA182), *lacrimal bone* – *oslacrimale* (HA183), *lateral wall* – *parieslateralis* (HA193), *scapular neck* – *collum scapulae* (HA214), *lesser tubercle* – *tuberculum minus* (HA217), *greater tubercle* – *tuberculum majus* (HA217), *carpal bone*

– *ossa carpi* (HA227), *pubic bone* – *os pubis* (HA239), *femur head* – *caput femoris* (HA247), *alar folds* – *plicae alare* (HA258), *navicular bone* – *os naviculare* (HA263), *trapezius muscle* – *musculus trapezius* (HA290), *lateral head* – *caput laterale* (HA336), *tendon sheat* – *vagina tendinum* (HA352), *medial groove* – *sulcus medialis* (HA379), *femoral ring* – *anulus femoralis* (HA379), *muscular coat* – *tunica muscularis* (HA390).

One-word English and Latin anatomical terms are nouns. They make up only a small portion of anatomical terms. This article excludes one-word derived and compound terms that form a small share of anatomical terms: English one-word terms make up 2,7 per cent of the anatomical terms found, and Latin one-word terms make up 3,45 per cent of the terms found. These anatomical terms are mostly simple English and Latin or Greek root words. One-word terms are used to name the concepts of the main parts and organs of the human body (Litevkienė, 2006), e.g., *bone* – *os* (HA90), *eyesockets* – *orbitae* (HA193), *clavicle* – *clavicula* (HA212), *fontanelles* – *fonticuli* (HA203), *cheeks* – *buccae* (HA392), *palate* – *palatum* (HA393), *teeth* – *dentis* (HA395), *gums* – *gingivae* (HA398), *dentine* – *dentinum* (HA399), *enamel* – *enamelum* (HA399), *cement* – *cementum* (HA399), *tongue* – *lingua* (HA399), *lungs* – *pulmones* (HA399), *kidney* – *renes* (HA527), *prostate* – *prostata* (HA556), *ovary* – *ovarium* (HA560), *womb* – *uterus* (HA563), *vagina* – *vagina* (HA569). Although one-word terms are often considered better and more convenient to use, in science, technology and other special fields of human activity, more complex concepts are usually named using compound terms that form the majority of terms in many fields.

This article discusses English and Latin compound anatomical terms that are usually made up of two or three words. Multi-word (four-word, five-word) compound terms are very rare.

It is maintained that there are several times more two-word terms than three-word terms in most scientific fields. Statistically, Latin two-word anatomical terms make up 31 per cent of all found Latin compound anatomical terms; English two-word terms found make up 32 per cent. Every fifth English compound anatomical term and almost every fifth Latin compound term is a three-word. Only roughly one in seventeen English and one in twenty compound Latin terms is four-word. English five-word terms comprise only 1 per cent of all English compound anatomical terms found. Latin five-word terms also comprise only 1 per cent of all Latin compound anatomical terms found. The examples show that no English and Latin six-eight-word anatomical terms are found. Supposedly, such

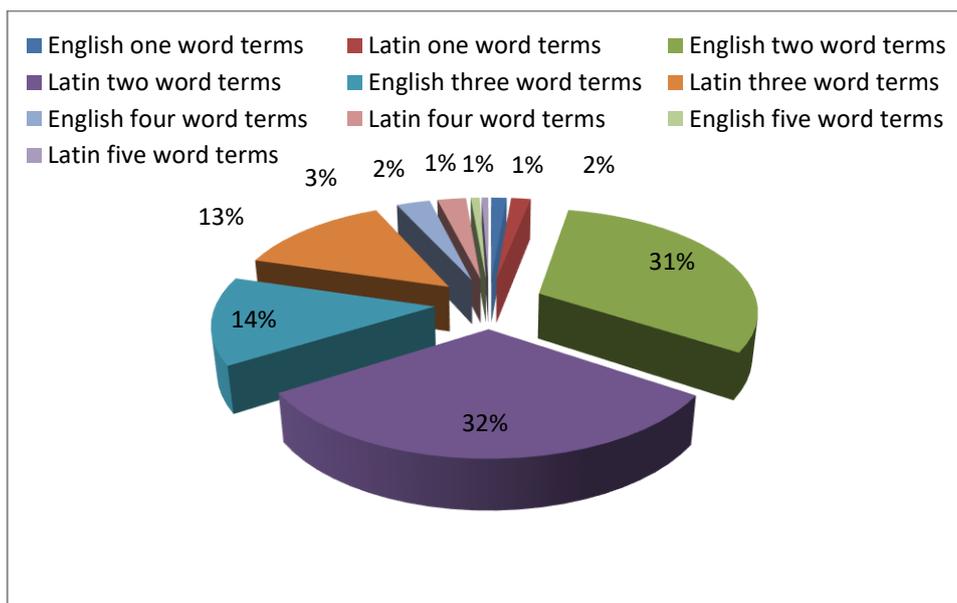


Fig. 1. Frequency of English and Latin compound terms

As seen, the largest group consists of English two-word terms (437) and Latin two-word terms (442). English three-word terms and Latin three-word terms make up a smaller proportion (191 and 189, respectively).

Configurations¹ of English Two-Word Anatomical Terms and Their Latin Equivalents

A two-word term can be expressed as follows:
 $f^2 (t_1 \dots\dots\dots t_n) = f (t_1 \dots\dots\dots t_n)$, when $n = 2$
 (Litevkienė, 2006)

English two-word anatomical terms and their Latin equivalents form four more commonly used types of grammatical configurations:

1. $Adj_N^3 + S_N \leftrightarrow S_N + Adj_N$;
2. $S_G + S_N \leftrightarrow S_N + S_G$;
3. $Adj_N + S_N \leftrightarrow S_N + S_G$;
4. $S_G + S_N \leftrightarrow S_N + Adj_N$;

Since each grammatical configuration can yield several two-component combinations, a total of 8 two-element grammatical configurations of English two-word terms and their Latin equivalents can be obtained. First, aspects of coincidence between two-word compound terms will be discussed.

There are 5 configurations of coinciding two-word anatomical terms and their Latin equivalents and 3 configurations of different two-word terms. English two-word anatomical terms and their Latin equivalents form eight grammatical configurations.

The following grammatical configurations characterise two-word English terms and their Latin equivalents:

1. Nominative of an adjective (attribute) + nominative of a noun (determinative) \equiv^4 nominative of a noun (determinative) + nominative of an adjective (attribute):

$Adj_{NP} + S_N \equiv S_N + Adj_{NP}$		
spongy texture	–	spinal canal
substantia spongiosa		–
(HA92)		canalis vertebralis
medullary cavity	–	lumbar vertebrae
medullaris (HA93)		–
		vertebrae lumbales
		(HA135)
articular cartilage	–	pelvic surface
cartilage articularis		–
(HA95)		facies pelvina
simple joint	–	tranverse lines
simplex (HA122)		–
		lineae transversae
		(HA137)

¹According to K. Gaivenis, S. Keinys, the concept *configuration* means a syntactic model (Gaivenis, Keinys 1990).

²The author grounds on the theory Ross Moore, a mathematician of Macquarie University (Sydney) and Nika Draka, a programmer of Leeds University (England) about the construction of compound term

computerised systems, symbols and diversification of compound term systems.

³S – substantive; Adj– adjective; P –participle; N – numeral; N_o– ordinal, Pr– pronoun; N– nominative; G– genitive;

s – simple; c– comparative; s– superlative; c– compound; m– mixed composition, p – positive.

⁴adequate

compound joint – articulation composita (HA122)	sacral tuberosity – tuberositas sacralis (HA137)
trochoid joint – articulation trochoidea (HA123)	auricular surface – facies auriculares (HA137)
plane joint – articulation plana (HA123)	coccygeal vertebrae – vertebrae coccygeae (HA138)
vertebral column – columna vertebralis (HA131)	clavicular notch – incisura clavicularis (HA150)
transverse process – processus transversus (HA132)	thoracic cavity – cavum thoracis (HA154)
piriformis muscle – musculuspiriformis (HA359)	gracilis muscle – musculus gracilis (HA364)

2. Genitive of a noun (attribute) + nominative of a noun (determinative) \equiv nominative of a noun (determinative) + genitive of a noun (attribute):

$$S_G + S_N \equiv S_N + S_G$$

bone marrow – medulla ossium (HA93)	femur head – caput femoris (HA247)
arch pedicle – pediculus sarcus (HA138)	hip joint – articulatio coxae (HA249)
rib neck – collum costae (HA150)	knee joint – articulatio genus (HA256)
mandible ramus – ramus mandibulae (HA188)	tendon sheath – vagina tendinum (HA352)
nose cavity – cavumnasi (HA199)	root canal – canalis dentis (HA398)
neck bone – collum radii (HA223)	larynx inlet – aditus laryngis (HA492)
elbow joint – articulatio cubiti (HA224)	lung hilum – hilus pulmonis (HA506)
hip bone – oscoxae (HA238)	lung root – radix pulmonis (HA506)
lung alveoli – alveoli pulmonis (HA511)	rib angle – angulus costae (HA151)
ovary hilum – hilus ovarii (HA560)	shoulder joint – articulatio humeri (HA218)

3. Nominative of the comparative adjective (attribute) + nominative of a noun (determinative) \equiv nominative of a noun (determinative) + nominative of the comparative adjective (attribute):

$$Adj_{NC} + S_N \equiv S_N + Adj_{NC}$$

anterior arch – arcus anterior (HA134)	lesser horns – cornua minora (HA189)
--	--------------------------------------

posterior arch – arcus anterior (HA134)	greater tubercle – tuberculum majus (HA217)
anterior surface – facies anterior (HA177)	lesser tubercle – tuberculum minus (HA217)
greater horns – cornua majora (HA189)	anterior fontanelle – fonticulus anterior (HA203)
greater trochanter – trochanter major (HA247)	posterior fontanelle – fonticulus posterior (HA203)
lesser trochanter – trochanter minus (HA247)	lesser omentum – omentum minus (HA474)
anterior border – margo anterior (HA506)	greater omentum – omentum major (HA474)
upper lobe – lobus superior (HA507)	lower lobe – lobus inferior (HA507)

4. Active participle (attribute) + nominative of a noun (determinative) \equiv nominative of a noun (determinative) + active participle (attribute):

$$P_N + S_N \equiv S_N + P_N$$

floating ribs – costae fluctuantes (HA150)
ascending colon – colon ascendens (HA447)
descending colon – colon descendens (HA447)
deferens ductus – vas deferens (HA546)

5. Nominative of the superlative adjective (attribute) + nominative of a noun (determinative) \equiv nominative of a noun (determinative) + nominative of the superlative adjective (attribute):

$$Adj_{NS} + S_N \equiv S_N + Adj_{NS}$$

longissimus muscle – musculus longissimus (HA293)

6. Nominative of an adjective (attribute) + nominative of a noun (determinative) \neq^5 nominative of a noun (determinative) + genitive of a noun (attribute):

$$Adj_{NP+} + S_N \neq S_N + S_G$$

nuchal ligament – ligamentum nuchae (HA144)	crural fascia – fascia cruris (HA374)
sternal membrane – membrana sterni (HA152)	oral cavity – cavitas oris (HA390)
thoracic cavity – cavum thoracis (HA154)	apical foramen – foramen apicis (HA398)
trigeminal impression – impressio trigemini (HA170)	raphel pharynx – raphe pharyngis (HA420)

⁵different

scapular neck – collum scapulae (HA214)	abdominal cavity – cavitas abdominis (HA428)	petrosquamosa (HA169)	
humeral condyle – condylushumeri (HA218)	pelvic cavity – cavitas pelvis (HA428)	tympanosquamous fissure – fissura tympanosquamosa (HA169)	sternocostal triangle – trigonum sternocostale (HA301)
carpal bone – ossa carpi (HA227)	gastric sac – sinus ventriculi (HA433)	petrotympanic fissure – fissure petrotympanica (HA169)	sternoclavicular joint – articulation sternoclavicularis (HA214)
carpal sulcus – sulcus carpi (HA228)	peritoneal cavity – cavumperitonei (HA471)	temporomandibular joint – articulation temporomandibularis (HA191)	
pleural cavity – cavum pleurae (HA517)	nasal cavity – cavitasnasi (HA489)		
laryngeal cavity – cavum laryngis (HA500)	pelvic diaphragm – diaphragma pelvis (HA571)		

7. Nominative of the mixed formation adjective (attribute) + nominative of a noun (determinative) ≠ nominative of a noun (determinative) + genitive of the mixed formation adjective (attribute):

$$Adj_{Nc} + S_N \neq S_{Nc} + S_G$$

petrosquamous fissure – fissurae	duodenojejunal flexure – flexura duodenojejunalis (HA440)
----------------------------------	---

8. Nominative of a noun (attribute) + nominative of a noun (determinative) ≠ nominative of a noun (determinative):

$$S_{N.} + S_N \neq S_N$$

breast bone – sternum (HA150)
shoulder blade – scapula (HA214)

The comparison of the data is presented in Fig. 2.

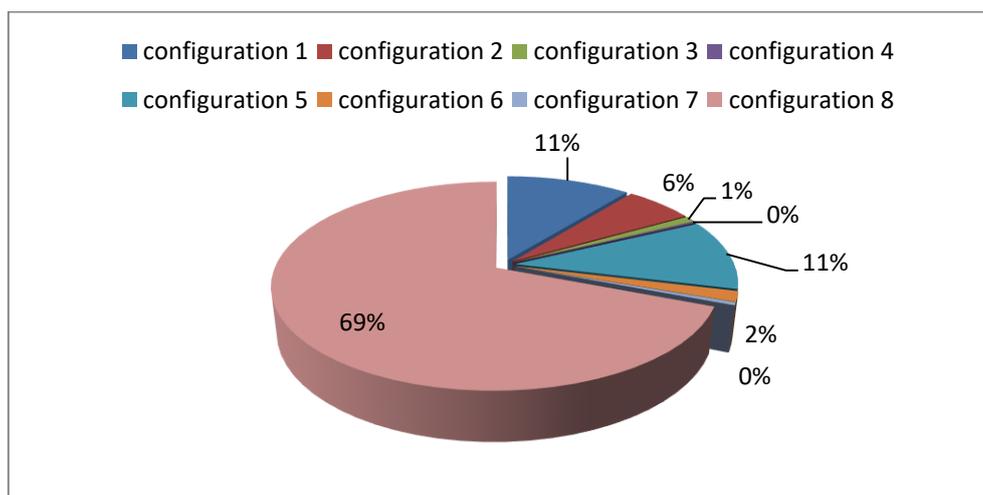


Fig. 2. Frequency of grammatical configurations of two-word English and Latin anatomical terms

It can be stated that most of the configurations of English two-word anatomical terms and their Latin equivalents $Adj_N + S_N \equiv S_N + Adj_N$, $S_G + S_N \equiv S_N + S_G$, $Adj_{Nc} + S_N \equiv S_N + Adj_{Nc}$, $P_N + S_N \equiv S_N + P_N$, $Adj_{Ns} + S_N \equiv S_N + Adj_{Ns}$ are identical. This represents 86.96 per cent of the anatomical terms found in the source. Cases of configuration differences were detected in configurations $Adj_N + S_N \neq S_N + S_G$, $Adj_{Nc} + S_N \neq S_{Nc} + S_G$, $S_{N.} + S_N \neq S_N$. The largest proportion of identical configurations consists of $Adj_N + S_N \equiv S_N + Adj_N$ (69.1 per cent). The terms with configurations $S_G + S_N \equiv S_N + S_G$ make up one-tenth of two-word terms; the terms with configurations $Adj_{Nc} + S_N \equiv S_N + Adj_{Nc}$, almost 6 per cent. Two-

word English terms and their Latin equivalents in which attributes are expressed by participles, superlative adjectives are extremely rare (they make up only one per cent of two-word anatomical terms found). Attributes of two out of three two-word identical anatomical terms are agreed attributes that are usually expressed by an adjective: *agreed attribute + attribute* and *attribute + agreed attribute*.

Configurations of English Three-Word Anatomical Terms and Their Latin Equivalents

A three-word term can be expressed as follows:

$f(t_1 \dots t_n) = f(t_1 \dots t_n)$, where = 3 English three-word terms account for 14 per cent of all found compound anatomical terms, and Latin three-word anatomical terms account for 13 per cent. In terms of statistics, both these English and Latin terms are used quite often in anatomical terminology. They are surpassed only by two-word terms.

It has been observed that the following types of grammatical configurations of English three-word anatomical terms and their Latin equivalents occur most frequently:

1. Nominative of the comparative (attribute) + nominative of an adjective (attribute) + nominative of a noun (determinative) \equiv nominative of a noun (determinative) + nominative of an adjective (attribute) + nominative of the comparative (attribute):

$Adj_{NC} + Adj_{NP} + S_N \equiv S_N + Adj_{NP} + Adj_{NC}$

superior articular facet – fovea articularis superior (HA134)	greater palatine foramen – foramen palatinum majus (HA183)
inferior articular facet – fovea articularis inferior (HA134)	greater palatine sulcus – sulcus palatinus major (HA183)
superior surficial vertebra – fovea costalis superior (HA135)	lesser palatine canals – canales palatini minores (HA183)
inferior surficial vertebra – fovea costalis inferior (HA135)	inferior nasal concha – concha nasalis inferior (HA183)
anterior longitudinal ligament – ligamentum longitudinale anterius (HA144)	superior orbital fissure – fissura orbitalis superior (HA193)
posterior longitudinal ligament – ligamentum longitudinale posterius (HA144)	inferior orbital fissure – fissura orbitalis inferior (HA193)
anterior nasal spine – spina nasalis anterior (HA180)	anterior nasal spine – spina nasalis anterior (HA194)
inferior orbital fissurae – fissura orbitalis inferior (HA195)	anterior cranial fossa – fossa cranii anterior (HA197)
posterior cranial fossa – fossa cranii posterior (HA197)	inferior nasal meatus – meatus nasi inferior (HA202)

superior nasal meatus – meatus nasi superior (HA202)	larger multangular bone – os multangulum majus (HA228)
smaller multangular bone – os multangulum minus (HA228)	greater sciatic foramina – foramen ischiadicum majus (HA242)

2. Nominative of an adjective (attribute) + nominative of an adjective (attribute) + nominative of a noun (determinative) \equiv nominative of a noun (determinative) + nominative of an adjective (attribute) + nominative of an adjective (attribute):

$Adj_{NP} + Adj_{NP} + S_N \equiv S_N + Adj_{NP} + Adj_{NP}$

transverse costal facet – fovea costalis transversus (HA135)	external intercostal muscles – musculi intercostales externi (HA298)
common nasal meatus – meatus nasi communis (HA202)	internal intercostal muscles – musculi intercostales interni (HA298)
radial carpal ligament – ligamentum carpi radiatum (HA233)	superficial inguinal ring – annulus inguinalis superficialis (HA311)
subcutaneous prepatellar bursa – bursa subcutanea prepatellaris (HA259)	deep inguinal ring – annulus inguinalis profundus (HA311)
deep infrapatellar bursa – bursa infrapatellaris profunda (HA259)	lateral inguinal fossa – fossa inguinalis lateralis (HA312)
surface navicular bone – facies articularis navicularis (HA261)	scalenus medius muscle – musculus scalenus medius (HA317)
transverse tarsal joint – articulatio tarsi transversa (HA268)	pronator quadratus muscle – musculus pronator quadratus (HA341)
long plantar ligament – ligamentum plantare longum (HA271)	short palmar muscle – musculus palmaris brevis (HA348)
medial bicipital groove – sulcus bicipitalis medialis (HA353)	gluteus medius muscle – musculus gluteus medius (HA358)
lateral bicipital groove – sulcus bicipitalis lateralis (HA353)	vastus lateralis muscle – musculus rectus lateralis (HA361)

3. Nominative of the comparative (attribute) + nominative of the mixed formation adjective

(attribute) + nominative of a noun (determinative) ≡ nominative of a noun (determinative) + nominative of the mixed formation adjective (attribute) + nominative of the comparative (attribute):

$Adj_{NC} + Adj_{Nm} + S_N \equiv S_N + Adj_{Nm} + Adj_{NC}$

anterior sacrococcygeal ligament – ligamentum sacrococcygeum anterior (HA145)
 anterior atlantooccipital membrane – membrana atlantooccipitalis anterior (HA146)
 anterior sternoclavicular ligaments – ligamentum sternoclaviculare anterior (HA215)
 posterior sternoclavicular ligaments – ligamentum sternoclaviculare posterior (HA215)
 thumb carpometacarpal joint – articulatio carpometacarpea pollicis (HA235)

4. Nominative of an adjective (attribute) + nominative of a noun (attribute) + nominative of a noun (determinative) ≠ nominative of a noun (determinative) + nominative of an adjective (attribute) + genitive of a noun (attribute):

$Adj_N + S_N + S_N \neq S_N + Adj_N + S_G$

<p>nasal part pharyngis – pars nasalis pharyngis (HA417) dorsal hand fascia – fascia dorsalis manus (HA352) transverse knee ligament – ligamentum transversum genus (HA256) sacrum bone base – apex ossis sacri (HA136) levator scapulae muscle – musculus levator scapulae (HA291) Transversus thoracis muscle – musculus transverses thoracis (HA299) rectus abdominis muscle – musculus rectus abdominis (HA305) triceps surae muscle – musculus triceps surae (HA367)</p>	<p>biceps femoris muscle – musculus biceps femoris (HA362) rectus femoris muscle – musculus rectus femoris (HA361) biceps brachii muscle – musculus biceps brachii (HA336) triceps brachii muscle – musculus triceps brachii (HA336) longus cervicis muscle – musculus longus colli (HA318) longus capitis muscle – musculus longus capitis (HA318) orbicularis oculi muscle – musculus orbicularis oculi (HA328) rectus abdominis muscle – musculus rectus abdominis (HA305)</p>
--	--

5. Nominative of an adjective (attribute) + nominative of an adjective (attribute) + nominative of a noun (determinative) ≡ nominative of a noun (determinative) + genitive of a noun (attribute) + nominative of an adjective (attribute):

$Adj_N + Adj_N + S_N \neq S_N + S_G + Adj_N$

internal urethral orifice – ostium urethrae internum (HA543)
 external urethral orifice – ostium urethrae externum (HA543)
 medial patellar retinacula – retinacula patellae mediale (HA258)
 transverse tarsal joint – articulatio tarsi transversa (HA268)

6. Nominative of an adjective (attribute) + nominative of the comparative (attribute) + nominative of a noun (determinative) ≠ nominative of a noun (determinative) + nominative of an adjective (attribute) + nominative of the comparative (attribute):

$Adj_{NP} + Adj_{NC} + S_N \neq S_N + Adj_{NP} + Adj_{NC}$

psoas major muscle – musculus psoas major (HA357)
 zygomaticus minor muscle – musculus zygomaticus minor (HA329)
 pectoralis minor muscle – musculus pectoralis minor (HA297)
 pectoralis major muscle – musculus pectoralis major (HA297)
 tibialis anterior muscle – musculus tibialis anterior (HA365)
 pectoralis minor muscle – musculus pectoralis minor (HA297)
 pectoralis major muscle – musculus pectoralis major (HA297)

7. Nominative of an adjective (attribute) + nominative of the comparative adjective (attribute) + nominative of a noun (determinative) ≠ nominative of a noun (determinative) + nominative of an adjective (attribute) + nominative of the comparative adjective (attribute):

$Adj_{NP} + Adj_{NS} + S_N \neq S_N + Adj_{NS} + S_G$

widest dorsi muscle – musculus latissimus dorsi (HA290)

8. Nominative of an adjective (attribute) + nominative of the superlative (attribute) + nominative of a noun (determinative) ≠ nominative of a noun (determinative) + nominative of an adjective (attribute) + nominative of the superlative (attribute):

$Adj_{NP} + Adj_{NS} + S_N \neq S_N + Adj_{NP} + Adj_{NS}$

gluteus maximus muscle – musculus gluteus maximus (HA358)

After analysing English three-word terms and their Latin equivalents, the diversification of equivalents is summarised. These terms may be used to name both general categories denoting general concepts (anatomical structure, organ, body space, body structure) and separate categories denoting specific aspects (Litevkienė, 2006).

As already mentioned, English three-word terms make up 27.5 per cent of all found compound anatomical terms, and Latin three-word terms make up 27.1 per cent of found compound terms. From a statistical standpoint, they are quite common in anatomical terminology.

Usually, English and Latin three-word anatomical terms have a certain order of elements: *English: attribute + attribute + determinative; Latin: determinative + attribute + attribute.*

The most common configurations of three-word English and Latin anatomical terms are $Adj_{NC} + Adj_{NP} + S_N \equiv S_{N.} + Adj_{NP} + Adj_{NC}$, $Adj_{NP} + Adj_{NP} + S_N \equiv S_N + Adj_{NP} + Adj_{NP}$, $Adj_N + S_{N.} + S_N \neq S_N + Adj_N + S_G$. A total of 169 grammatical configuration pairs have been found. It is easy to notice that in the above-mentioned compound terms (*English three-word terms – Latin three-word terms*), the secondary elements of English terms consist of *agreed attribute + non-agreed attribute*; and of Latin compound terms, *agreed attribute + agreed attribute*. To sum up, it could be stated that in Latin anatomy terminology, compound terms whose elements are agreed attributes are more common. As already mentioned, secondary elements of most Latin compound terms are *agreed attribute + agreed*

References

1. Berghammer, G. (2006). Translation and the language(s) of medicine: Keys to producing a successful German-English translation, *The Journal of the European Medical Writers Association*, 15, (2), 40-44.
2. Džuganová, B. (2002). A brief outline of the development of medical English. *BratisLekListy*, 103-227.
3. Džuganová, B. (2013). English medical terminology – different ways of forming medical terms. *JAHHR*, 4, (7), 55-69.
4. Bujalková, M. (2018). The Coexistence of Latin and English in Medical Terminology and its Contribution to ESP Teaching, *International Journal of Humanities Social Sciences and Education (IJHSSE)*, 5(6), 7-14.
5. Gaivenis, K., Keinys, St. (1990). *Kalbotoyros terminų žodynas*. Kaunas: Šviesa, 1990, 278.
6. Kostromina, T. (2007). The Language of Medicine as a Means of Professional Communication, *KSMU*, 1-205.

attribute, and it is obvious that the genitive of the noun as a secondary element is less frequently used.

Conclusions

English and Latin two-word and three-word anatomical terms are used quite often. 628 English two-word and three-word terms and 631 such Latin terms were found in the sources. Secondary elements of the majority of English two-word terms are agreed attributes. Often, secondary elements of most Latin two-word terms are non-agreed attributes. Two-word identical terms are more common than different ones. Secondary elements in two-word terms are often expressed by a positive adjective, comparative adjective, and present participle. A superlative adjective and an ordinal occur very rarely.

English and Latin three-word terms occur less often than two-word terms, and half of these term groups consist of different grammatical configurations. A large part of three-word terms consists of terms whose second element is a comparative adjective (40.8 per cent).

The analysis of English and Latin compound anatomical terms supplements the available research on medical terminology and highlights the similarities and differences between the Latin and English languages, which determine the trends in the formation of terminology in this scientific field. The study could be used as guidelines in writing anatomy textbooks and compiling dictionaries of medical terms and anatomy atlases.

7. Kuchar, E. J. (2016). In Medical Latin as Used by Polish Physicians: a Rare Case of Influence of Modern English on the Dead Language, *UWM Olsztyn ActaNeophilologica* XVIII (1), 5-13.
8. Litevkienė, N. (2006). *Lithuanian and Latin Composite Anatomical Terms* Doctoral dissertation. Kaunas: VDU.
9. Repas, L., (2013). *Basics of Medical Terminology: Latin and Greek origins*, *LitografijaNyomda*, Debrecen, 1-14.
10. Prives, M. et al. (1985). *Human Anatomy (Vol. I)*. Mir Publishers. 13-18.

Resource

1. H.A. – Human Anatomy – Prives, M. et al. (1985). *Human Anatomy (Vol. I)*. Mir Publishers.

SUDĖTINIAI ANGLIŠKI ANATOMIJOS TERMINAI IR JŲ LOTYNIŠKIEJI ATITIKMENYS VADOVĖLYJE ŽMOGAUS ANATOMIJA (I TOMAS)

Anotacija

Seniausia kalba, kuri atliko labai svarbų vaidmenį medicinos kalboje Europoje buvo graikų kalba. Angliška medicinos terminija susiformavo iš viduramžių lotyniškosios terminijos, kuri perėmė išvystytą graikų terminiją. Šiuolaikinė anatomijos terminologija pagrįsta šimtmečių senumo tradicijomis ir žiniomis, kurios nuolat peržiūrimos. Dauguma šiandien medicinoje vartojamų anatominių ir klinikinių terminų yra lotyniški arba lotynizuoti graikiški žodžiai, kurių kilmė siekia V m.e. amžių. Prives, V. Bushkovich, N. Lisenkov vadovėlyje „Human anatomy“ pateikiamas pažangus aprašomosios, evoliucinės, funkcinės ir praktinės anatomijos požiūris. Anatomijos terminija yra bendrosios medicinos terminijos pagrindas, todėl labai svarbu, kad gydytojai ir mokslininkai visame pasaulyje vartotų vienodus terminus kiekvienam anatominiam vienetui įvardyti. Vadovėlio medicinos terminus iš esmės galima suskirstyti į vieno žodžio ir kelių žodžių terminus. Vienažodžiai terminai gali būti paprasti (neišvestiniai) žodžiai, išvestiniai žodžiai, junginiai arba išvestinių ir sudėtinių žodžių deriniai. Sudėtinius anatominius terminus gali sudaryti iš dviejų-penkių žodžių. Straipsnyje pateikiama vadovėlio „Human Anatomy“ sudėtinių dvižodžių ir trižodžių anglišių ir lotynišių anatomijos terminų ir jų konfigūracijų analizė. Šiame darbe norėta pateikti detalią anglišių ir lotynišių dvižodžių-trižodžių anatomijos terminų dėmenų analizę sutapties, skirties aspektais, įtraukiant tokių terminų struktūrų dažnio ir vartosenos tendencijas. Taikant aprašomąjį ir lyginamąjį metodus, analizuojama anatomijos terminologija. Kiekybinei ir kokybinei (konkrečių konfigūracijų) analizei atlikti taikytas aprašomasis analizės metodas. Angliški ir lotyniški sudėtiniai anatomijos terminai vadovėlyje „Human Anatomy“ sudaro didžiąją sudėtinių terminų grupę. Manoma, kad daugumos mokslo sričių dvižodžių terminų yra keliskart daugiau nei trižodžių. Vertinant statistškai, lotyniški dvižodžiai anatomijos terminai sudaro 32 procentus visų rastų lotynišių sudėtinių anatomijos terminų, anglišių dvižodžių rasta 31 procentas. Kas penktas angliškas sudėtinis anatomijos terminas ir beveik kas penktas lotyniškas sudėtinis terminas yra trižodis.

Reikšminiai žodžiai: angliški anatomijos terminai, lotyniški anatomijos terminai, sudėtiniai anatomijos terminai, konfigūracijos.

Information about the author

Nijolė Litevkienė, PhD. Associate professor at the Department of Management and Communication, the Faculty of Business and Technologies, Šiauliai State University of Applied Sciences.

E-mail address: n.litevkiene@svako.lt