ENGLISH ANATOMICAL TERMS BY ORIGIN IN THE TEXTBOOK *HUMAN ANATOMY(I-II)*

Nijolė Litevkienė, Jelena Korosteliova
Šiaulių valstybinė kolegija
Lithuania

Annotation

This research is aimed to identify the particularities of English anatomical terms, based on comparative description of structural forms and in terms of origin. One-word and compound English and Latin anatomical terms are compared. This research was based on the use of anatomical terms in the textbook "Human Anatomy", published by M. Prives, V. Bushkovich, N. Lisenkov, who offer a progressive view towards? descriptive, evolutionary, functional, and practical anatomy. Medical terms in the textbook can be basically divided into one-word and multi-word terms. One-word terms can be simple words, derived words, compounds, or a combination of derived and compound words. Compound anatomical terms can consist of two-six words. More than a half of the one-word English anatomical terms are formed on the basis of the English lexis. Most English compound anatomical terms are formed using the terms of Latin or Greek languages.

Key words: *one-word anatomical terms, compound anatomical terms, borrowed terms, terms formed on the basis of the lexis of one's own language.*

Introduction

Anatomy is the study of the body. The actual term derives from the Greek verb "anatomein", which means "to cut open, to dissect". It describes the most important process of this field of study – the opening up and dissecting of the body into its individual parts and their description.

The field of anatomy, one of the most ancient sciences, first evolved in Egypt. From the Early Dynastic Period (3100 BC) until the time of Galen at the end of the 2nd century AD, Egypt was the center of anatomical knowledge, including neuroanatomy. Knowledge of neuroanatomy first became important so that sacred rituals could be performed by ancient Egyptian embalmers during mummification procedures. Later, neuroanatomy became a science to be studied by wise men at the ancient temple of Memphis. As religious conflicts developed, the study of the human body became restricted. Myths started to replace scientific research, squelching further exploration of the human body until Alexander the Great founded the city of Alexandria. This period witnessed a revolution in the study of anatomy and functional anatomy (Elhadi, Ali M. et al., 2012).

The development of anatomy as science extends from the first examinations of victims of sacrifices to the sophisticated analyses currently done by modern scientists. It is characterized, over time, by the continuous development of the understanding of the structure of the body and the function of the organs. Human Anatomy has a prestigious history and is considered the most prominent of the biological sciences until the 19th century and early 20th century. Methods of study improved dramatically, allowing study from examination through dissection of bodies to the use of technologically complex techniques? Anatomy is one of the foundations of medical education and is taught since at least the end of the Middle Ages. The format and amount of information prepared to young doctors have evolved and changed in association with the demands of the medical profession. What is taught today differs significantly from the past, but the methods used to teach have not changed significantly. For example, the famous public dissections that occurred at the end of the Middle Ages and early Renaissance can now be considered the "anatomical demonstrations" used in practical classes (Mandarim-de-Lacerda,C. A., 2010).

The Greek physician Galen (2nd century AD) synthesized the medical knowledge of Antiquity. The Romans (as in many fields) took over Greek medical knowledge, translating and re-writing Greek books. The greatest Roman scholar was Celsius who is considered a founder of Latin medical terminology. The Latin language lacked the names for many medical notions, especially the terms for pathological conditions, which is why Celsius and others had to translate Greek terms into Latin, while simultaneously using Greek terms in the Greek form. This way the two-fold Latin-Greek medical terminology was founded. The Greek part of the terminology was Latinized. Even long after the fall of the Roman Empire, Latin was still the language of communication. It was used in two forms: spoken, also called Vulgar Latin, which gradually evolved into many Romance languages, and written or literary Latin, which was used as a language of educated people in schools, offices, and churches. Medieval Latin differed

from classical Latin because it was not the language of any ethnic group. In this respect, it was a dead language. In the Middle Ages, Latin was a means of communication for all educated people in Europe. All scientific texts were written in Latin. In this period, universities were established in Western Europe, and Medicine as one of the "Arts" (Sciences) could be studied there under master physicians. The period after 1500 AD is called New Latin. This lasted till the first half of the 19th century (Bujalková,2018).

Terminology is a system of concepts. It is a combination of names, words and combinations of words used to denote exactly and in a concrete way 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 Anatomo-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). In the textbook "Greco-Latin Medical Terminology", Bujalková and Jurečková explain that the history of medical terminology is a part of the history of medicine because medical terms reflect to a certain extent the development of medicine in a given period. The modern language of medicine employs modern derivatives of Greek and Latin words "with no concern for etymological purity". The corpus of Greek and Latin terminology is still the base of contemporary medical language, which also uses new eponyms, acronyms, and trade names (Bujalková, Jurečková, 2020).

The Latin language, which was no longer used by any nation after the fall of the Roman Empire, was dead in a sense. Since the 5th century, it has no longer been used in everyday life and therefore has not changed. Thus, the language that keeps the unchanging meanings of words is very suitable for terms. Therefore, terminology for many new fields of science is created using Latin (and Latinized Greek) formation components that have become international. According to the German medical historian H. Schipperges[1], the Latin language has established itself in medicine too. In H. Schipperges' opinion, Latin and Greek languages not only"masterfully lived through" the influence of Arabic languages in the Middle Ages but also withstood a "fierce attack" of the English language in the 20th century (Litevkienė, 2006).

People often saythat Latin is a dead language. What does it mean for a language to be dead, exactly? Languages aren't organisms, and they don't die like them, either. They don't have a pulse we can check. So how do we know when a language has actually died? Do languages like Latin behave the same way, or are there different "levels" of death? Is Latin really dead, or is it "slightly alive"? And supposing it is "all dead," can it rise again?

After its founding in 753 BC, the Roman Empire endured for about 1,000 years. The founder of Rome was the legendary Romulus and the last Roman Emperor was Romulus Augustus, so the Empire begins and ends with a Romulus. But the Latin language did not die immediately with the Empire. It would linger on as a living language for another 500 years, at least. When did Latin die? To oversimplify the matter, Latin began to die out in the 6th century shortly after the fall of Rome in 476 A.D. The fall of Rome precipitated the fragmentation of the empire, which allowed distinct local Latin dialects to develop, dialects which eventually transformed into the modern Romance languages.

In a sense, then, Latin never died – it simply changed. So, Latin did not die when Rome fell. Rome's fall merely began this process of change. After all, how do we know when a language has died? The most commonplace answer is: "When it is no longer spoken as a first language." So, to know Latin's time of death, we need to figure out when the last generation of native Latin speakers died out.(Blake, A. (2023). *When Did Latin Die*? retrieved 2023-01-27 from: https://ancientlanguage.com/when-did-latin-die/).

English, which belongs to the Proto-Indo-European parent language, was also quite considerably influenced by Latin. English, unlike French, has many borrowed words from other languages. About half of the words in modern English have come from Latin.

Although English does not belong to the group of the Romance languages, Latin had a significant influence on English. Richard A. LaFleur[2], a professor of the classical languages at

[1]Heinrich Schipperges, German physician, educator. Recipient Albert Schweitzer medal, 1983, Paracelsus medal, 1989, Ernst-Jung-medal, 1991.Member Heidelberger Akademy Wissenschaften. Doctor of Medicine, University Bonn, Germany, 1951.Doctor of Philosophy, University Bonn, 1952.Habilitation, University Bonn, 1959.

[2]Richard A. LaFleur is Franklin Professor of Classics Emeritus at the University of Georgia, where he taught from 1972 to 2012 and served for 21 years as head of one of the largest Classics and Latin programs in North America. His books include *The Teaching of Latin in American Schools: A Profession in Crisis*, *Latin Poetry for the Beginning Student*, *Love and Transformation: An Ovid Reader*, *Latin for the 21st Century: From Concept to Classroom*, *A Song of War: Readings from Vergil's Aeneid* (with Alexander G. McKay), *Scribblers, Sculptors, and Scribes*, *Ubi Fera Sunt* (the authorized Latin translation of Maurice Sendak's popular children's book, Where the Wild Things Are), *The Secret Lives of Words* (a

the University of Georgia, states that various studies have proved a significant connection between the Latin language and other languages. It was common in the activities of every lawyer or scientist. English, unlike French, did not hesitate to borrow words from other languages. There are quite many words in the English language that have not changed at all either semantically or orthographically.

Latin/English	*Latin/English*	*Latin/English*
superior–superior(LLŽ836)/ (AKŽ657)	census–census (LLŽ140)/(AKŽ91)	inferior–inferior(LLŽ420)/(AKŽ327)
animal–animal(LLŽ62)/(AKŽ26)	error–error (LLŽ290)/(AKŽ206)	exterior–exterior(LLŽ312)/(AKŽ217)
genus–genus(LLŽ355)/(AKŽ259)	honor– honor(LLŽ380)/(AKŽ305)	minus–minus(LLŽ534)/(AKŽ404)
orator–orator (LLŽ599)/ (AKŽ566)	par–par (LLŽ612)/(AKŽ454)	plus–plus(LLŽ658)/(AKŽ482)
terminus–terminus(LLŽ857) (AKŽ678)	victor–victor (LLŽ920)/(AKŽ727)	insomnia– insomnia(LLŽ434)/(AKŽ332)
interim–interim(LLŽ442)/ (AKŽ424)	gladiator–gladiator (LLŽ35)/(AKŽ263)	simulacrum– simulacrum(LLŽ796)/(AKŽ773)
maximum–maximum(LLŽ519)/ (AKŽ393)	species–species (LLŽ806)/(AKŽ622)	cancer–cancer(LLŽ127)/(AKŽ82)
actor–actor(LLŽ15)/(AKŽ13)	fungus– fungus(LLŽ347)/(AKŽ253)	minimum– minimum(LLŽ533)/(AKŽ404)
rumor–rumor(LLŽ759) /(AKŽ558)	alibi –alibi((LLŽ45)/(AKŽ20)	bronchitis– bronchitis(LLŽ118)/(AKŽ74)

Fig. 1. English and Latin words identical in the orthographic and semantic aspect

In the modern era in which English is the world's language, the fact that interference of English into the modern language of medicine is getting more powerful cannot be denied. The latest results of research are published mostly in English and new medical terms for diseases, laboratory and investigation procedures are also in English. Karwacka W. confirms that the scientific world is predominantly English-speaking and major scientific journals publish papers in English (Karwacka, 2015). The share of scientific papers written in English in the total number of papers published is 80% according to Montgomery S. L. (Montgomery, 2009) and 85% according to Kaplan (Kaplan, 2001). In contrast, 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 nomenclature, "Terminologia Anatomica" (1998) is in Latin which serves as a basis for national versions including English language versions. Medical terminology may be divided into two main parts: anatomical (based on Latin) and clinical (based on Greek). The modern anatomical terminology is based on the centuries-old tradition and knowledge that is constantly revised. Clinical medicine has not finished its development yet and there are many questions for it to answer regarding the aetiology of the existing diseases as well as new ones. 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 (Bujalková, 2018).

The extensive borrowing of words from Latin and Greek into English that began about 1500 AD 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 words were needed to describe these new discoveries and inventions. Medical scientists turned to the early Greek and Roman physicians, especially Hippocrates[3], Galen[4] and Celsius[5], and borrowed words from their medical treatises. Latin, Greek and Latinized Greek medical terms penetrated into English medical terminology in various forms:

collection of his nationally syndicated newspaper columns), and the revised editions of *Wheelock's Latin*, *Wheelock's Latin Reader*, and *Workbook for Wheelock's Latin*.

[3]Hippocrates, (born c. 460 BCE, island of Cos, Greece—died c. 375 BCE, Larissa, Thessaly), ancient Greek physician who lived during Greece's Classical period and is traditionally regarded as the father of medicine. It is difficult to isolate the facts of Hippocrates' life from the later tales told about him or to assess his medicine accurately in the face of centuries of reverence for him as the ideal physician. About 60 medical writings have survived that bear his name, most of which were not written by him. (https://www.britannica.com/biography/Hippocrates)

[4]Galen, Greek Galenos, Latin Galenus, (born 129 CE, Pergamum, Mysia, Anatolia [now Bergama, Turkey]—died *c.* 216), Greek physician, writer, and philosopher who exercised a dominant influence on medical theory and practice in Europe from the Middle Ages until the mid-17th century. (https://www.britannica.com/biography/Galen)

[5]Anders Celsius (born 27 November 1701 – 25 April 1744) was a Swedish astronomer, physicist and mathematician. He was professor of astronomy at Uppsala University from 1730 to 1744, but travelled from 1732 to 1735 visiting notable observatories in Germany, Italy and France. He founded the Uppsala Astronomical Observatory in 1741, and in 1742 proposed (an inverted form of) the Centigrade temperature scale which was later renamed Celsius in his honour. (https://en.wikipedia.org/wiki/Anders_Celsius)

- terms preserved in original ancient Greek form (e.g. diabetes, pneumonia, carcinoma, trauma);
- Latinized Greek medical terms (bronchus/from Gr.bronchos; colon/from Gr.kolon; coma/fromGr.koma; bacterium/from Gr.bakterion);
- terms preserved in original Latin form (abdomen, aorta, tonsillitis, virus);
- Latin terms assimilated into English (mandibula → mandible; musculus → muscle; pulsus → pulse; corona → crown);
- terms with dropped endings (organon → organ; orgasmos→ orgasm; spasmos→ spasm; stomachos→ stomach(Bujalková, 2018).

Over the last two centuries medicine has undergone great specialisation and differentiation into individual branches that have had to create their own terminologies. While in the past, medical English used more Greek and Latin elements when forming new terms (up to four-fifths of English scientific words are of Latin, Greek-Latin, or Romance origin), today's English uses increasingly more of its own language material. English in the 20th century became the most important interpreter of the latest news and thanks to its easy access through mass media, it has started to influence the language systems of other nations (Dzuganová, 2002).

In the first publicistic writings in medicine, Vincas Kudirka (1858-1899) used some anatomical terms that have survived until now. Jonas Basanavičius (1851-1927) started the creation of Lithuanian medical nomenclature as a system. Between the two world wars, Jurgis Žilinskas (1885-1957) and his colleagues tried to unify the system, and Petras Avižonis (1875-1939) quite successfully created terms in eye structure and ophthalmology in general. After the Second World War, Lithuanian anatomical terminology developed when translating Russian hand-booksand preparing an authentic Lithuanian textbook of anatomy for university students (1972, 1984), as well as by working on the Dictionary of medical terminology (1988). Salezijus Pavilonis (1919-1998) and Kazimieras Tamašauskas (1936-1998) distinguished themselves especially. Nevertheless, Lithuanian anatomical terminology is far from perfect and future generations of anatomists will have much to do (Česnys, 2015).

The rise of the movement of Lithuanian national rebirth at the end of the 19th century speeded up the publication of works in Lithuanian. Popular books, booklets, articles in newspapers and almanacs on various issues of medicine became more numerous. One of the doctors who was educating people on health issues was a famous Lithuanian public figure Vincas Kudirka. Vincas Kudirka used quite a lot of Lithuanian names for body parts and organs, although these terms did not take root in the language. The majority of the words he tried to use as medical terms? were words of folk language. He was not content with borrowings, but was looking for Lithuanian equivalents to name medical concepts and created some Lithuanian medical terms as a result (Zemlevičiūtė, 2008).

THE DIVERSITY OF STRUCTURES OF ENGLISH COMPOUND ANATOMICAL TERMS

The goal of the research is to find out what is the relationship of English and Latin one-word and compound anatomical terms by origin. To achieve that aim, the following objectives are set: the article first reviews the development of Latin anatomical terminology, the comparison of English and Latin one-word and compound anatomical terms according to the diversification of origins of the elements, systematizes diversification aspects of elements of English and Latin terms.

Research methods are the following: theoretical, classification and generalisation of data.

It is believed that there are several times more two-word terms than three-word terms in most scientific fields. Statistically, Latin and English two-word anatomical terms account for 70% of all found Latin and English compound anatomical terms. One in five English and Latin compound anatomical terms is a three-word term. Only about one in sixty English compound terms is four-word. Longer English terms do not even make up a hundredth part: Latin five-word and six-word terms account for only about 3% of all compound anatomical terms found in the source. The examples show that no eight-word English and Latin anatomical terms are found in the source. It is believed that no such Latin and English compound anatomical terms exist. They are likely to occur only in clinical terminology.

This article discusses English and Latin one-word and compound anatomical terms. Anatomical terms are usually made up of two or three words. Multi-word (four-to-six-word) compound terms are very rare.

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, N. Lisenkov. The textbook on human anatomy by M. Prives, V. Bushkovich, N. Lisenkov under the general editorship of prof. M. Prives reflects the 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 contains a discussion of the influence of social factors, including the influence of 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 its 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 the stagnant subject of university courses but as a progressive science with important prospects. The textbook has been published four times in Spanish for the use in Latin America (Litevkienė, 2022).

After analyzing 5,500 French medical terms, A. M. Rassinoux found that the largest part of French medical terms were compound terms. According to A. M. Rassinoux, P. Ruch and other scientists, compound medical terms vary greatly. In foreign linguistic literature, mostly clinical terms are discussed. English surgical terms were discussed by P. Ruch, R.H. Baud, C. Lovis and other foreign scientists. In their opinion, most of the terms in this field consist of compound and composite terms (Litevkienė, 2006).

Tom D. Turmezei states that while the roots of Modern English anatomical terminology mostly lie in Classical languages (accounting for the origin of 86% of terms), the anatomical lexicon of Modern English is actually much more diverse. Interesting and perhaps lessfamiliar examples from these languages and the methods by which such terms have been created and absorbed are discussed. The author suggests that awareness of anatomical etymologies may enhance the enjoyment and understanding of human anatomy for specialists (Turmezei, 2012).

The research object consists of 782 English anatomical terms and 782 Latin compound anatomical terms (1,564 terms in total). Anatomical terms are collected from the textbook Human Anatomy by M. Prives, V. Bushkovich, N. Lisenkov.

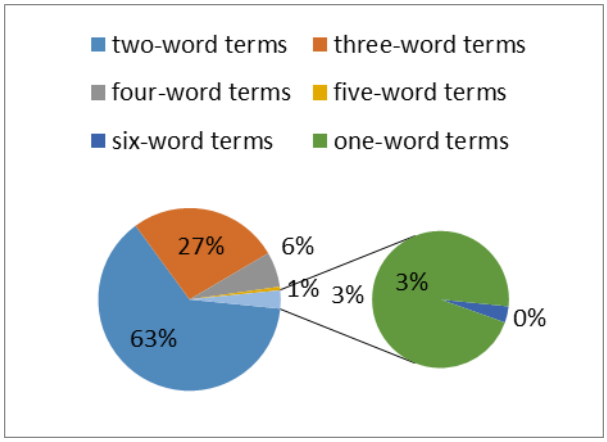

Fig. 2. Frequency of English and Latin compound terms in the source

This paper analyzes both one-word derived and composite terms, which make up a small part of anatomical terms: English and Latin one-word terms make up 4 percent of the number of anatomical terms found in the source. Although one-word terms are often considered better and more convenient to use, more complex concepts in the fields of science, technology and other special areas of human activity are named using compound terms, which make up the majority of terms in many fields. According to the provisions of the PNA (Nomina anatomica parisiensia) each organ must be named by only one term.

One-word English and Latin anatomical terms are nouns. One-word anatomical terms 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 4% of the number of anatomical terms found, Latin one-word terms make up 4% of the number of terms found. Most of these anatomical terms are 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). One-word terms borrowed from Latin and ancient Greek languages are mostly used.

English and Latin one-word anatomical terms found in the source.

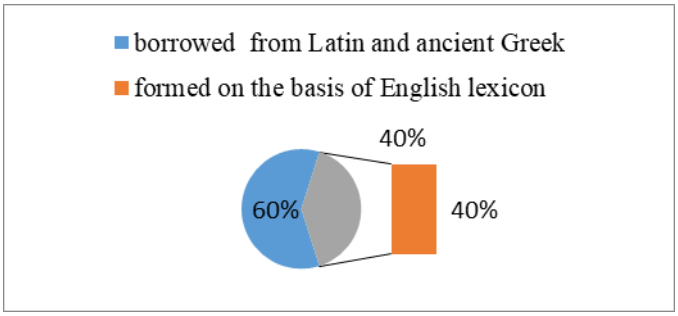

Fig.3. Diversity of English and Latin one-word anatomical terms by origin

One-word anatomical terms, formed on the basis of the English lexis: womb – uterusHA563; lungs – pulmonesHA506; kidney – renHA527; teeth – dentesHA395; gums – gingivaeHA398; tongue – linguaHA409; cheeks – buccaeHA392; eyesocks – orbitaeHA193; bone – osHA90; heart – corHA26; brain – encephalonHA179; muscle – musculesHA331, body – corpusHA166; rib – costaHA150; head – caputHA156; body – corpusHA189; neck – collumHA223; bely – venterHA327; lips – labiaHA391; root – radixHA396; tip – apexHA409; windpipe – tracheaHA502; foreskin – preputiumHA224.

One-word anatomical terms formed on the basis ofLatin or Greek languages:

lateral – lateralisHA84; ventral – ventralisHA84; cranium – craniumHA158; squamous – squamosaHA169; squama – squamaHA176; mandible – mandibulaHA185; orbits – orbitaeHA193; fontanelles – fontanelliHA203; clavicle – claviculaHA213; scapula – scapulaHA214; humerus – humerusHA217; condyle – condylusHA218; radius – radiusHA221; distal – distalisHA229; trapezoid – trapezoideusHA229; intermetacarpal – intermetacarpalisHA235; pubis – pubisHA238; ischium – ischiumHA239; apex – apexHA248; base – basisHA248; tibia – tibiaHA252; condyles – condylusHA253; tarsus – tarsusHA261; metatarsus – metatarsusHA263; phalanges – phalangesHA264; dorsal – dorsalisHA269; plantar – plantarisHA269; inguinal – inguinalisHA309; lacrimal – lacrimalisHA328; fossa – fossaHA352; transverse – transversusHA371; palate – palatumHA393; incisors – incisiviHA401; canines – caniniHA403; molars – molaresHA405; pharynx – pharynxHA416; oesophagus – oesophagusHA421; thymus – thymusHA151; hemispheres – hemipheriaHA194; vagina – vagina HA569; prostate – prostataHA556; ovary – ovariumHA560; dentine – dentinumHA399; enamel – enamelumHA399; cement – cementumHA399.

DIVERSITY OF ENGLISH COMPOUND ANATOMICAL TERMS BY ORIGIN

As can be seen, the largest group consists of English two-word terms (458) and Latin two-word terms (458). In total, 916 two-word anatomical terms were found. English three-word and Latin three-word terms make up a smaller share (173) (see Fig.1). English and Latin four-word, five-word and six-word terms found in the source make up about 7 percent. One-word terms found in the textbook Human Anatomy by M. Prives, V. Bushkovich, N. Lisenkov make up about three percent of all anatomical terms found in the source.

Compound terms, as a separate kind of terms, were first distinguished and named by a famous Lithuanian linguist J. Jablonskis[6] while reviewing K. Jaunius' "Grammar of the Lithuanian language" in 1913. He called the terms made up of several words the composite terms (Gaivenis, 1975).

English and Latin two-word anatomical terms generally exist in two varieties: national and international. In terms of origin, terms are different: they can be formed on the basis of the lexis of one's own language, borrowed (most often Latin and Ancient Greek languages are used), and, finally, mixed or hybrids. From this point of view, English and Latin two-word anatomical terms can be divided into three groups.

[6]Jonas Jablonskis (nicknames *Rygiškių Jonas, Petras Kriaušaitis*, born on December 30, 1860, in Kubilėliai, Šakiai district, died on February 23, 1930, in Kaunas) is a Lithuanian linguist who standardized the Lithuanian language. J. Jablonskis' works and activities are particularly significant in the transition of Lithuanian literature from dialects to the use of the standard language. J. Jablonskis is the most famous standardiser of the Lithuanian language. He completely established the Lithuanian alphabet, introduced an abundance of neologisms: names of days, future, past, writer, school, scientist, cases, linguistic terms, mathematical terms. On the other hand, he did not avoid international words either when the commission for international words of the Lithuanian language began to standardize international words.

Terms formed on the basis of the lexis of one's own language	*Borrowed terms*	*Hybrid terms*
outer table – lamina externaHA93; inner table – lamina internaHA93; bone marrow – cavitas medullarisHA93; fatty pads – plicae adiposaeHA119; simple joint – articulatio simplexHA122; saddle joint – articulatio sellarisHA126; plane joint – articulatio planaHA123; true ribs – costae veraeHA150; false ribs – costae spuriaeHA150; greater wings – alae majoresHA166; nasal notch – incissura nasalisHA180; teeth sockets – alveoli dentalesHA187; greater horns – cornua majoraHA189; lesser horns – cornuaminoraHA189; shoulder joint – articulatio humeriHA218; neck bone – collum radiiHA223; elbow joint – articulatio cubitiHA224; wrist joint – articulatio radiocarpeaHA232; hip bone – oscoxaeHA238; hip joint – articulatio coxaeHA249; knee joint – articulatio genusHA256; ankle joint – articulatio talocruralisHA266; long head – caput longumHA336; simple glands – glandulae simplicesHA389; gall bladder – vesica felleaHA465; middle lobe – lobusmediusHA507; upper lobe –lobussuperiorHA507; lower lobe – lobusinferiorHA507; right lung – pulmodexterHA515; left lung – pulmo sinisterHA516; facial sheat – vagina bulbiHA411; white matter – substantia albaHA173; ear drum – membrane tympaniHA383; simple arc – arcus simplexHA157; middle coat – tunica mediaHA13; inner coat – tunica intimaHA13; outer coat – tunica externaHA13; breast bone – sternumHA150; teeth sockets – alveoli dentalesHA150	pulmonary trunk – truncus pulmonalisHA53; brachiocephalle trunk – truncus brachiocephalicusHA53; occipital artery – arteria occipitalisHA53; choroid artery – arteria choioideaHA61; vertebral artery – arteria vertebralisHA62; brachial artery – arteria brachialisHA67; intestinal arteries – arteriae intestinalesHA80; renal artery – arteria renalisHA82; cephalic vein – cephalic veinHA105; intestinal trunk – truncus intestinalisHA130; oculomotor nerve – nervus oculomotoriusHA181; hypoglossal nerve – nervus hypoglossusHA181; rhomboid foss – fossa rhomboideaHA198; hypoglossal nerve – nervus hypoglossusHA200 tectal lamina – tectum mesencephaliHA202; cerebral peduncles – pedunculi cerebriHA203; accessory nucleus – nucleus accessoriusHA204; reticular formation – formatioreticularisHA205; optic chiasma – chiasma opticumHA209; precentral gyrus – gyrus precentralisHA214; orbital sulci – sulci orbitalesHA216; lingual gyrus – gyrus lingualisHA218; lateral ventricles – ventriculi lateralesHA220; lentiform nucleus – nucleus lentiformisHA225; caudate nucleus – nucleus caudatusHA225; cerebrapontine tract – tractus corticopontinusHA228; occipital sinus – sinus occipitalisHA243; spinal nerves – nervi spinalesHA251	right atrium – atrium dextrumHA27; left ventricle – ventriculus dexterHA30; fourth ventricle – ventriculus quartusHA197; mamillary bodies – corpora mamillariaHA209; posterior horn – cornua posteriusHA220; articular surfaces – facies articularesHA118 synoval folds – plicae synovialesHA119 complex joint – articulatio complexaHA122; thoracic cage – compage sthoracisHA154; vertebral arch – arcus vertebraleHA132; pelvic surface – facies pelvinaHA137; auricular surface – facies auricularesHA137; intervertebral joint – articulatio intervertebralesHA144; iugular notch – incisura jugularisHA150; clavicular notch – incisura clavicularisHA150; costal facets – incisurae costalesHA150; rib angle – anguluscostaeHA151; flouting ribs – costae fluctuantesHA150; occipital bone – os occipitaleHA163; cerebral surface – facies cerebralisHA169; frontal border – margo frontalisHA175; squamosal border – margo squamosaHA175; medial bundle – fasciculus medialisHA192; meningal branch – ramus meningeusHA252; lateral branch – ramus lateralisHA252; muscular branches – rami muscularesHA269; temporal branches – rami temporalesHA296

In some cases, the compound two-word terms in which one component is formed based on the English lexis and the other one is formed from a Latin term (hybrid terms) can be of two types: in most terms, the *main* component with regard to origin is based on the English lexis, and the secondary component is Latin.

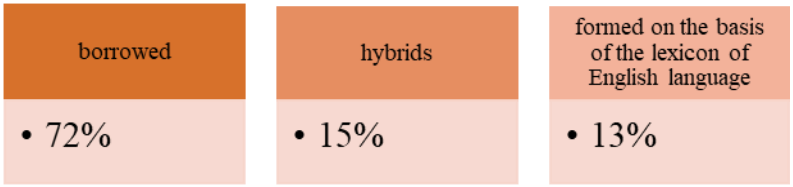

Fig.4. Diversity of English two-word anatomical terms by origin

Compound two-word hybrid terms whose secondary term is based on the English lexis are in the minority – they make up only 1% of all hybrid two-word terms found in the source.

215 pairs of English and Latin three-word terms were found in the source. With regard to origin, three-word terms are diverse. From this standpoint, English three-word terms can be divided into two groups.

Borrowed terms	*Hybrid terms*
superior articular process – processus articularis superiorHA132; inferior articular process – procesus articularis inferiorHA132; anterior sacral foramina – foramina sacraliapelvinaHA137; posterior sacral foramina – foramina sacralia dorsaliaHA137; anterior longitudinal ligament – ligamentum longitudinal anteriusHA144; posterior longitudinal ligament – ligamentum longitudinal posteriusHA144; anterior sacrococcygeal ligament – ligamentum sacrococcygeum ventraleHA145; inferior nuchal lines – lineae nuchae inferioresHA165; internal occipital protuberantia – protuberantia occipitalis internaHA165; external acustic meatus – meatus acusticusexternusHA169; anterior sacral foramina – foramina sacralia pelvinaHA137; posterior sacral foramina – foramina sacralia pelvinaHA137; anterior longitudinal ligament – ligamentum longitudinale anteriusHA144; external auditory meatus – meatus acusticus externusHA170; anterior nasal spine – spina nasalis anteriorHA180; inferior nasal concha – concha nasalis inferiorHA183; inferior orbital fissure – fissura orbitalis inferiorHA193	superior articular facet – fovea articularis superiorHA134; inferior articular facet – fovea articularis inferiorHA134; scalenus anterior muscle – musculus scalenus anterior HA151; yellow bone marrow – medulla ossiumflavaHA94; red bone marrow – medulla ossium rubraHA94; external occipital crest – crista occipitalia externaHA165; superior articular facet–fovea articularis superiorHA134; transverse costal facet – fovea costalis transversusHA135; highest nasal concha – concha nasalis supremaHA177; greater palatine foramen – foramen palatinum majusHA183; greater palatine sulcus – sulcus palatinum majusHA183; greater palatine canal – canalis palatinus majorHA195; middle cranial fossa – fossa cranii mediaHA197; middle nasal meatus – meatus nasi mediusHA202; common nasal meatus - meatus nasi communisHA202; smaller multangular bone – os multangulum minusHA228; distal radicular joint – articulatio radiculnaris distalisHA232

Three-word anatomical terms found in the source can be divided into two groups: borrowed (Latin and Ancient Greek languages are mostly used) and mixed or hybrids. The above-discussed cases of English three-word anatomical terms in terms by origin can be represented by a diagram:

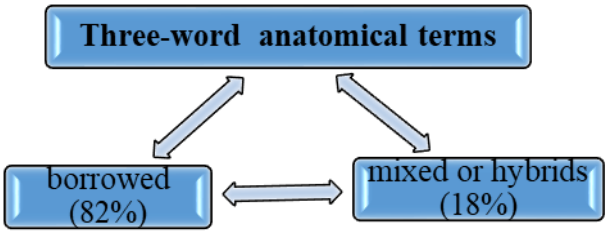

Fig. 5. Three-word English anatomical terms by origin

Few English four-word anatomical terms are found in the source. Four-word anatomical terms account for only about 6 percent of all anatomical terms found. English four-word terms can be divided into borrowed (as mentioned, from Latin and Greek languages) and hybrid. Two-thirds of four-word anatomical terms are borrowed (from Latin and Ancient Greek languages).

Borrowed terms
superficial posterior sacrococcygal ligament – ligamentum sacrococcygeum dorsalis superficiale HA144;serratus posterior superior muscle – musculus serratus posterior superiorHA291;serratus posterior inferior muscle – musculus serratus posterior inferiorHA291;obliquus capitis superior muscle – musculus obliquus capitis superiorHA294;obliquus capitis inferior muscle – musculus obliquus capitis inferiorHA294;levatores costarum breves muscles – musculi levatores costarum brevesHA294;levatores costarum longi muscles – musculi levatores costarum longiHA294;external oblique abdominal muscle – musculus obliquus externus abdominalisHA302;internal oblique abdominal muscle – musculus obliquus internus abdominalisHA302;rectus sheat abdominis muscle – vagina musculi recti abdominalisHA305;subtendinous bursa subscapularis muscle – bursa subtendinea musculi subscapularisHA220;sheat abdominis rectus muscle – vagina musculi recti abdominisHA305;posterior circumflex humeral artery – arteria circumflexa humeri posteriorHA67;anterior circumflex humeral artery – arteria circumflexa humeri anteriorHA67;superficial circumflex iliac artery – arteria circumflexa ilium superficialisHA87;lateral anterior malleolar arteries – arteriae malleolares anteriores lateralesHA91;medial anterior malleolar arteries – arteriae malleolares anteriores medialesHA91; external iliac lymph gland – nodus lymphaticus illiacus externusHA;common iliac lymph gland – nodus lymphaticus iliacus communiHA137;internal iliac lymph gland – nodus lymphaticus illiacus internusHA;medial cutaneous arm nerve – nervus cutaneus brachii medialisHA262;medial cutaneus foramen nerve – nervus cutaneus antebrachii medialisHA262;superior transverse scapular ligament – ligamentum transversum scapulae superiusHA217;inferior transverse scapular ligament – ligamentum transversum scapulae inferiusHA217;anterior superior iliac spine – spina iliaca anterior superiorHA239;anterior posterior iliac spine – spina iliaca anterior

posteriorHA239;serratus posterior superior muscle – musculus serratus posterior superiorHA291;serratus posterior inferior muscle – musculus serratus posterior inferiorHA291;obliquus capitis inferior muscle – musculus obliquus capitis inferiorHA294;levatorescostarum breves muscles – musculi levatores costarum brevesHA295;levatores costarum longi muscles – musculi levatores costarum longiHA295;levator anguli oris muscle – musculus levator anguli orisHA329;depressor labii inferioris muscle – musculus depressor labii inferiorisHA329;flexor digitorum sublimis muscle – musculus digitorum superficialisHA339; flexor pollicis longus muscle – musculus flexor pollicis longusHA340;flexor digitorum profundus muscle – musculus flexor digitorum profundusHA341.

About 94 percent of all English four-word hybrid anatomical terms found are terms whose first secondary component is formed on the basis of the English language. Only about 4 percent ofterms of this type have their second component formed on the basis of the English lexis; about 2 percent have their third component formed on the basis of the English lexis. About one third of four-word borrowed terms (from Latin and Greek) are mixed or hybrid. Mixed/hybrid terms can be divided into three groups:

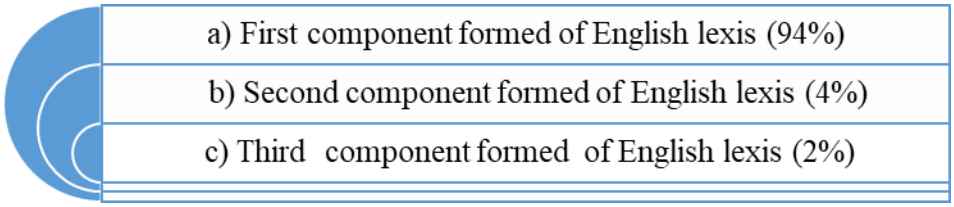

Fig. 6. Components of English four-word borrowed words (Latin and Ancient Greek languages) by origin

a) Four-word terms of a) group:

deep posterior sacrococcyegal ligament – ligamentum sacrococcygeum dorsale profundumHA144;groove inferior petrosal sinus – sulcus sinus petrosi inferiorisHA165;deep transverse metacarpal ligaments – ligament metacarpea transversa profundaHA236; first dorsal metacarpal artery – arteria metacarpea dorsalia primaHA68; first dorsal metatarsal artery – arteria metatarsea dorsalis primaHA93; deep circumflex iliac vein – vena circumflexa ilium profundaHA116.

b) Four-word terms of b) group:

sulcus greater petrosal nerve – sulcus nervi petrosi majorisHA171;

sulcuslesser petrosal nerve – sulcus nervi petrosi minorisHA171.

c) Four-word terms of c) group:

posterior cutaneus thigh nerve – nervus cutaneus femoris posteriorHA271.

Only 1 percent of five-word anatomical terms were found in the source. All components of two-thirds of English five-word anatomical terms found in the source are borrowed words from Latin or Greek languages. These terms do not have components formed on the basis of the English lexis:

extensor carpi radialis brevis muscle – musculus extensor carpi radialis brevisHA344; communis synovalis musculorum flexorum vagina– vagina synovalis communis musculorum flexorumHA354;minor posterior capitis rectus musculus – musculus rectus capitis posterior minorHA294.

In one third of English five-word anatomical terms and their Latin equivalents found in the source, several components are formed on the basis of the English lexis: the third or the third and fourth secondary element:

cervical layer superficialis fasciae proper – lamina superficialis fasciae colli propriaeHA321;

deep layer cervicalis fasciae proper – lamina profunda fasciae colli propriaeHA322.

Only one six-word anatomical term was found. The English anatomical term is called hybrid: the first, third and fourth secondary components are formed on the basis ofthe English lexis:

synovial sheath of long flexor thumb muscle – vagina tendinis musculi flexoris pollicis longiHA355.

Conclusions

The dominant language of science is English. All the most influential medical journals are written in English. We have entered the era of medical English, which resembles the era of medical Latin in that, once again, physicians have chosen a single language for international communication. English is rooted in the classical languages. It is estimated that about 90% of the medical vocabulary in English is of Greek or Latin origin. One cannot deny the huge impact of ancient Greek on medical terminology. It may be concluded that the modern language of medicine basically represents the ancient Greek language transcribed into Latin. English

equivalents sounding almost identical to the original term show that removing Latin from the languages taught/learned was not the right decision. Even poor knowledge of a foreign language (English or a Romance language, and even a Germanic language) is enough to read a diagnosis written abroad, if the reader has at least a basic knowledge of Latin. This review may be helpful in this respect, and it might form the basis for learning medical terminology in other languages, especially in English (Jóskowska, Grabarczyk, 2013).

This article analyses nearly one thousand five hundred English and Latin one-word and multi-word anatomical terms with regard to their origin. English anatomical terms can be terms derived from ancient Greek and Latin languages, terms based on the English lexis, and hybrid anatomical terms. Almost two-thirds of the one-word anatomical terms found in the source are based on Greek and Latin languages. Two-word anatomical terms make up about two-thirds of all terms found in the source, of which only about one-seventh are English-based terms, and more than two-thirds are borrowed from Latin and ancient Greek. One tenth of such terms are hybrid terms. There are no three-word, four-word, five-word terms based on the English language. More than two-thirds of the three-word English anatomical terms, found in the source, are derived from ancient languages, and hybrid terms make up a smaller part. It can be assumed that the possibility of finding terms formed on the basis of the English language is decreasing along with the increasing number of elements in the compound terms.

Resources:

AKŽ – Anglų kalbos mokomasis žodynas – (1997). Alma littera.

LKŽ – Lotynų – lietuvių kalbų žodynas – (1996).Mokslo ir enciklopedijų leidykla.

HA – Human Anatomy – Prives, M. et al. (1985). Human Anatomy (Vol.I-II). Mir Publishers.

References

1. Blake, A. (2023). *When Did Latin Die*? Retrieved from https://ancientlanguage.com/when-did-latin-die/.

2. 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) Volume 5, Issue 6, pp. 7-14.*

3. Bujalková, M, Jurečková, A. (2020). *Greco-Latin Medical Terminology.Textbook for Students of Medicine.*Brožovaná, p.188.

4. Česnys, G. (2015). Lietuviško anatomijos vardyno istorijos metmenys. *Terminologija 9*, Vilnius university.

5. Elhadi, M. A. et al. (2012). The journey of discovering skull base anatomy in ancient Egypt and the special influence of Alexandria. *Journal of neurosurgery,*pp. 1-12.

6. Dzuganová, B. (2002). A brief outline of the development of medical English. *Bratisl Lek Listy 103 (6),* pp. 223-227.

7. Gaivenis, K. (1975). Dvižodžiai sudėtiniai terminai dabartinėje lietuvių kalboje. *Lietuvių terminologija, Lietuvių kalbotyros klausimai, T. 16*, pp. 57-89.

8. John, S., Dalley, A. F., (1998). Terminologia Anatomica. International Anatomical Terminology. Thieme, Stuttgart. *Revised Anatomical Terminology David G. Greathouse,* PT, PhD, pp.1-5.

9. Jóskowska, K., Grabarczyk Z. (2013). Greek and Latin in medical terminology. *Department of Applied Linguistics, Nicolas Copernicus University, Collegium Medicum in Bydgoszcz, Poland.Volume 1, Number 2*, pp.41–52.

10. Kaplan, R. B. (2001). The Dominance of English as a Language of Science: Effects on Other Languages and Language Communities.*1st ed. Berlin, Germany/New York, U. S*.: *Mouton deGruyter, ch. English the Accidental Language of Science*, pp. 3-26.

11. Karwacka, W.(2015). Ways to Translation.*1st ed. Łódź, Poland: Wydawnictwo Uniwersytetu Łódzkiego, pp*. 271-298.

12. Kostromina, T. (2007). *The Language of Medicine as a Means of Professional Communication,* Kursk.

13. Litevkienė, N.(2006). Lithuanian and Latin Composite Anatomical Terms.Doctoral dissertation. Kaunas: VDU.

14. Litevkienė, N. (2022). English Fourand Five Word Anatomical Terms and their Latin Equivalents in the Textbook Human Anatomy(Vol.I). *Professional studies: theory anad practice,* Nº11 (26), pp. 24-31.

15.Mandarim-de-Lacerda, C. A. (2010). Brief History of Anatomy.*Rio de Janeiro, Brazil November,* p. 1-15.

16. Montgomery, S.L. (2009). English and Science: realities and issues for translation in the age of an expanding lingua franca, Int. *The Journal of Specialised Translation. Issue 11*, January, pp. 6-11.

17. Rassinoux,A.-M., Rush, P. (2000). Semantic Handling of Medical Compound Words through Sound Analysis and Generation Processes.*PubMed*, p. 675.

18. Turmezei, T. D. (2012). *The linguistic roots of Modern English anatomical terminology*. Clin. Anat. Wiley Periodicals, Inc., pp. 1015-1022.

19. Zemlevičiūtė, P. (2008). Lietuviški Vinco Kudirkos medicinos terminai. *Terminologija,* 15, pp. 142-155.

Received: 17 February 2023.
Accepted: 17 April 2023.