

GREEK AND LATIN IN MEDICAL TERMINOLOGY

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History

Modern Western medicine traces its roots to the 5th century BCE, when the Greek physician Hippocrates (460-377) first attributed illness to physical causes, distinguished medical practice from priestly ministrations, and taught diagnosis by observation and treatment by fostering or restoring natural processes. Hippocrates and his disciples and successors, notably Galen (CE 130–201), produced a large and diverse body of medical writings in Greek. Many of the anatomic, pathologic, and therapeutic terms found in those writings remain in use today, some with little or no change in meaning.

From the beginning of the Christian era to the early 19th century, Latin served as a universal language for scholarly communication. Latin first assumed that role because it was the language of the Roman empire, which included most of Europe, parts of Asia, and Africa. Later it was kept in use as an international medium because it was more widely known than any regional language or dialect. Still later, when it had died out as a spoken language, a scientific and technical nomenclature based on Latin seemed likelier to resist semantic drift and erosion than a vernacular one.

Until the early modern era, the language of medicine consisted largely of Latin terms, many of them containing stems derived or adapted from Greek. Today Latin remains the official language of anatomic terminology and taxonomic nomenclature.

While taxonomic terms are Latin in form, many incorporate Greek lexical material or are formed from proper nouns, usually the names of specific persons or places (*Leishmania donovani*, *Salmonella arizonae*). In addition, many terms in physiology, pathology, and pharmacology are Latin or latinized Greek. These are to be distinguished from medical terms that, although coined from Greek and Latin lexical elements, are basically English in form and function (such as canalization, jejunectomy, periapical).

Whereas, a century ago, instruction in Latin was an integral part of elementary education throughout the Western world and Greek figured in most college curricula, few receive such instruction nowadays. The following brief guide, together with information supplied in the body of the dictionary, should enable the reader without classical training to handle most Greek and Latin medical terms correctly.

Greek Medical Terms

Greek words used in modern technical language have been transliterated (respelled) with letters of the Roman alphabet. Some Greek words preserve Greek inflectional endings (*chorion*, *dartos*) whereas others have been latinized (*antrum*, *bronchus*). Greek terms are generally pronounced according to the same rules as Latin.

The letters *k*, *y*, and *z* and the diphthongs *ch*, *ph*, and *th* occur in words of Greek origin but not in words of Latin origin. The letters *f*, *j*, *g*, and *v* occur in words of Latin origin but not in words of Greek origin. The letter *w* occurs in neither Greek nor Latin words.

Greek κ (kappa) is sometimes represented by *c* and sometimes by *k* (leukocytosis). Greek υ (upsilon) is sometimes represented by *u* and sometimes by *y* (leukocytosis). In American usage, the Greek diphthongs ατ and οτ are usually transliterated by *e* (*anemia*, *diarrhea*) and Greek ου by *u* (*anuria*). In British usage and in taxonomic nomenclature, however, ατ and οτ become respectively *ae* and *oe* (*anaemia*, *diarrhoea*, *Haemophilus*).

The distinction between capital and small (lowercase) letters and the use of capitals for proper nouns (*Addison disease*) and adjectives (*African sleeping sickness*) are modern, not classical, conventions. Proper nouns and adjectives in Latin medical phrases may be capitalized or not: *caput medusae* or *Medusae* 'Medusa's head', *sella turcica* or *Turcica* 'Turkish saddle'.

Remnants of Classical Grammar

Certain grammatical patterns and rules characteristic of the classical languages are retained and observed with classical words and phrases that have been adopted into medical English. Greek and Latin are more highly inflected languages than English. That is, they make more extensive and more varied use of changes in the endings of words to signal shifts of meaning (such as from singular to plural) and to show syntactic relations among the words of a phrase or sentence.

Plural Forms. Terms that retain their Latin form are usually, but not always, pluralized as in the parent language. Whereas we form the plural of an English noun by adding *-s* or *-es* (with a few exceptions such as *children* and *sheep*), the plural of a Latin noun may be formed in various ways depending on the class or declension to which the noun belongs; thus, *arteria*, *arteriae*; *diverticulum*, *diverticula*; *ductus*, *ductus*; *femur*, *femora*; *lentigo*, *lentiginis*; *nucleus*, *nuclei*; *species*, *species*.

Greek words that have not been fully latinized form their plurals according to Greek patterns: *ankylosis*, *ankyloses*; *arthritis*, *arthritides*; *condyloma*, *condylomata*. For some Greek and Latin terms, pluralization with *-s* is an acceptable alternative: *enemas* or *enemata*; *hernias* or *herniae*. It may even be preferred, as in the case of colons, fetuses, and hematomas.

Genitive Case. The genitive form or *case* of a noun denotes possession or some similar relation, usually one that can be expressed in English with the preposition *of*. Many standard medical phrases consist of two nouns, one in the nominative case and one in the genitive case: *abruptio placentae* 'tearing loose of the placenta', *hyperemesis gravidarum* 'excessive vomiting of pregnant women', and *taeniae coli* 'bands of the colon'.

Grammatical Concord. In Latin any adjectives modifying a noun must "agree" with it in number and gender (as well as case). For example, in the phrase *linea alba* 'white line' both noun and adjective are feminine singular, whereas in *nervi thoracici* 'thoracic nerves' both words are masculine plural. Although sometimes, as in these two examples, grammatical concord results in a phonetic match or rhyme, that is a mere coincidence. In many Latin noun-adjective phrases, no such rhyming occurs: *condyloma acuminatum*, *foramen magnum*, *labium majus*, *lichen planus*, *nervi digitales plantares communes*, *proctalgia fugax*.

Like these examples, most Latin medical terms are in the nominative case. When a phrase includes a noun in the genitive case, any adjectives modifying that noun must also be in the genitive case: (*musculus*) *extensor digiti minimi* 'extender of the little finger', (*musculus*) *tensor fasciae latae* 'tightener of the wide fascia'.

The Modern Pronunciation of Latin

The manner in which speakers of English pronounce medical terms and other words borrowed from classical Greek and Latin is neither fully standardized nor internally consistent. Moreover, it is at best a rough approximation to the way in which those words were said in classical times.

At least three distinct systems of pronunciation have been used in teaching Latin in Great Britain and the United States during the past century. None of them is believed to match the classical sounds exactly. Modern usage is a hodge-podge of contributions from all three systems, and in addition British and American usage differ on many points.

Many medical terms, while retaining their classical spelling, are pronounced in part as if they were English. Thus, although the final *e* of a Greek noun is usually pronounced, as in *syncope* and *systole*, it is sometimes silenced, as in *hydrocele* and *syndrome*. The Latin vowel sequence *ie* is often pronounced as a diphthong, as in English *brief*: *caries*, *scabies*.

The following remarks are intended as general guidelines to current usage. They should not be taken as fixed principles of universal acceptance.

Consonants. The consonant sounds represented by the letters *b, d, f, h, j, k, l, m, n, p, q, r, v, x,* and *z* are pronounced as in English. Initial *h* is pronounced like *z* (as in *xylophone*). In the romanized spelling of Greek words, the diphthong *ch*, representing the Greek letter χ (chi), is pronounced like *k*; *ph*, representing Φ (phi), is pronounced like *f*; and *th*, representing θ (theta), is pronounced as in thing.

The consonant sounds represented by the letters *c, g, n, s,* and *t* vary, as the following examples show.

- c* before *a, o, u,* or another consonant is pronounced like *k*:
calculus, sacrum
- c* before *ae, e, i, oe,* or *y* is pronounced like *s*: *africae, acinus, pancytopenia*
- c + e* or *i* before another vowel is pronounced as in *ocean, facial*: *rosacea* [ro-sa'sha], *Providencia* [pro-vi-den'sha]
- cc* before *e, i,* or *y* is pronounced like *x* (ks): *coccygeus, succedaneum*
- g* before *a, o, u,* or another consonant is pronounced as in *go*:
galea, gumba
- g* before *ae, e, i, oe,* or *y* is pronounced like *j*: *agenesis, gyrus*
- n* before *ch, k,* hard *c,* or hard *g* is pronounced like *ng*:
syncope, meningocoele
- n* before *j,* soft *c,* or soft *g* is pronounced *n*: *conjugata, lymphangitis*
- s* is generally pronounced as in *sister* and *joyous*, but:
s following *e* at the end of a word is pronounced like *z*:
ascites, varices
- s + i* before another vowel may be pronounced as in *leisure*:
atresia [a-tre'zha]
- sc + e* or *i* before another vowel is pronounced *sh*: *fascia* [fash'a]
- t* is generally pronounced as in *take* and *late*, but:
t + i before another vowel may be pronounced as in *nation*:
abruptio [ab-rup'sho], *syncytium* [sin-sish'um]

In words of Greek origin, *p* is silent (not pronounced) when it stands immediately before *n, s,* or *t* (*th*) at the beginning of a word: *pneusis* [noo'sis], *psaos* [so'as], *ptosis* [to'sis]. When the combination *pn, ps,* or *pt* occurs within a word, the *p* is usually pronounced, as in *apnea, hemoptysis*. When *cn, ct,* or *gn* stands at the beginning of a word, the first consonant in the pair is silent: *cnidocyst* [nido-sist], *Ctenocephalides* [teno-se-fali-dez], *gnathoschisis* [a-tho-ski-sis]. When these combinations occur within a word, both consonants are usually pronounced, as in *anticnemion, polyctenid,* and *prognathism*.

Vowels. The greatest inconsistency in the modern pronunciation of classical words appears in the sounds given to vowels and diphthongs. Accordingly the following should be taken as only a general description of current usage.

For each vowel, a long and a short pronunciation are distinguished, as follows.

- a* — long as in *baby*, short as in *hand*
- e* — long as in *be*, short as in *bed*
- i* — long as in *lie*, short as in *lip*
- o* — long as in *go*, short as in *got*
- u* — long as in *juvenile* (oo) or *cube* (yoo), short as in *gum*
- y* — long as in *fly*, short as in *gym*

The choice of vowel length depends on complex patterns of usage, which are somewhat inadequately represented by the rules usually quoted:

- A word has as many syllables as it has vowel and diphthongs.
- A single consonant standing between two vowels is pronounced with the following vowel (*a•la na•si*).

- Of two or more consonants standing between vowels, as many are joined with the following vowel as can be pronounced with it (*en•do•me•tri•um, phil•trum*).
- The vowel of an open syllable (one not ending in a consonant) is long.
- The vowel of a closed syllable (one ending in a consonant) is short.

Important exceptions to these rules are as follows:

- Final **a** (and often unstressed *a* within a word) is given a neutral 'uh' sound, as in *lig•a•men•tum, ve•na*.
- Before another vowel, unstressed *i* is often pronounced *e*: *brachium* [bra'ke-um].
- Double consonants are separated (*la•mel•la*).
- Compound words are often divided according to semantic rather than phonetic components: *hy•per•a•cu•sis, path•o•gen•e•sis*.
- A vowel in a stressed syllable often attracts to itself a following single consonant: *thal•a•mus, tib•i•a*.

Diphthongs. A diphthong is a fusion of two sounds (letters) to form a third, as in *ng* and *oy*. The modern treatment of classical diphthongs formed of two vowels is highly variable.

ae is pronounced like *e*: *alae, Haemophilus*

au is pronounced as in *taut*: *cauda, trauma*

ei is a diphthong in Greek terms, where it is pronounced like long *i* (*meiosis* [mi-o'sis]), but not in Latin terms (*cuneiformis* [kyu-ne-i-form'is])

eu is a diphthong in Greek terms, where it is pronounced like long *u* (*pneumonia* [noo-mo'ne-a]) or *yu* (*eukinesia* [yu-ki-ne'zha]), but not in terms from Latin (*cutaneous* [kyu-ta'ne-us])

oe is pronounced like *e*: *coelom, Entamoeba*

oi is a diphthong in some terms from Greek, where it is pronounced as in *oil* (*koilonychia* [koy-lo-nik'e-a]), but not in others (*allantois* [a-lan'to-is]), and not in Latin terms (*introitus* [in-tro'i-tus]).

Like the *ae* that represents Greek $\alpha\epsilon$ and the *oe* that represents Greek $\omicron\epsilon$, Latin *ae* and *oe* are reduced to *e* in American spelling (*previa, fetor*). The diphthongs are retained in British spelling (*praevia, foetor*) and in taxonomic terms (*Streptococcus faecalis, Peptostreptococcus foetidus*). In addition, final **ae** of Latin terms is retained in American spelling (*trabeculae, os coxae*).

Syllable Stress. Syllable stress in Latin and latinized Greek words follows complex rules, which can only be summarized here.

- In a word of two syllables, the stress falls on the first syllable (*fe'mur, la'rynx*).
- In a word of more than two syllables, the stress falls on the second-last syllable if it contains *y* (*hypopy'on*) or a diphthong (*apneu'sis*) or if it is immediately followed by two consonants or a doubled consonant (including *x;ks*): *abort'us, asterix'is, patel'la*. (Exception: If the second consonant following the vowel in the second-last syllable is **l** or **r**, the syllable may fall on the third-to-last syllable: *mul'tiplex, ver'tebra*.)
- Otherwise the stress may fall on either the second-last or third-to-last syllable, depending on the length of the vowel in the second-last syllable, which varies from word to word.

The usual pronunciation of many common words (*angi'na, gin'giva, rubeo'la, tin'nitus, ver'tigo*) violates the rules given above. The syllable stress is often misplaced in Greek and Latin words through the example of more familiar English words. Thus, English *sin'ister* but Latin *sinis'ter*; English *ves'ical* but Latin *vesi'ca*.