# Understanding medical words of Greek and Latin origin.*

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## ABSTRACT

Medical students may find medical terminology daunting, because they do not understand its origins, which in many cases are rooted in Greek and Latin. We begin by offering a brief overview of the ways in which these technical terms can be derived, before proposing a four-way classificatory system, based on the two dichotomies *structural-functional* and *literal-metaphorical*, which attempts to give a constrained description of the various sources of medical terminology of Classical (Greek and/or Latin) origin.

## INTRODUCTION

The vast majority of medical terminology originates from Latin or Greek. Some terms have a fairly transparent etymology-meaning relationship (e.g. *ulna*, which is simply the Latin for 'elbow'; see references for sources of etymologies[1–4], as well as for Latin[5] and Greek[6] dictionaries. The interested reader is invited to consult an introductory text on medical etymology[7–8]), while others have a more metaphorical, fable-like origin. One example of the latter is the C1 vertebral body, commonly known as the Atlas bone. Atlas was a primordial titan in Ancient Greek mythology. Along with the other Titans, Atlas was involved in a war against the familiar Olympian Gods. With the Greek Gods of Olympus victorious, Zeus, the king of the Olympians, sentenced Atlas to bear the heavens upon his shoulders for all eternity[9–10]. Thus, the first vertebral body was named Atlas, for it supports the head on the rest of the spinal vertebrae. (What is more, in much Classical art the heavens on Atlas' back are depicted as a globe: the parallelism between this and the roundness of the head can only have helped the imagery.)

As well as making use of individual Greek or Latin words, medical terms are often derived compositionally from combinations of words (or, frequently, from a Greek or Latin stem followed by a Greek or Latin suffix, such as *-itis*, *-oid*, or *-al(is)*, some of which are meaningful, some of which serve a purely grammatical purpose (e.g. making a noun out of an adjective)). As can be seen in Table 1, all six combinations are attested.

| Word formation | Example | Meaning |
|---|---|---|
| Single Latin word | *purpura* | purple |
| Single Greek word | *pleura* | rib |
| Latin + Latin | *ad + renal* | beside + kidney |
| Greek + Greek | *dys + kinesia* | difficult + movement |
| Latin + Greek | *de + hydrate* | removal + water |
| Greek + Latin | *peri + lymph* | around + clear water |

TABLE 1: Word formation strategies

This goes some way to explaining the mechanics of word formation, but it does not explain what motivates the choice of terminology. In this article, we wish to suggest that there is a very straightforward four-way distinction which can cross-categorise most if not all medical terms of Classical origin. Of course, we can discover further subdivisions, but this first approximation will help to group together some expressions whose meanings share the same kind of logic. Aside from this, we also hope that the reader will find some of the etymologies discussed to be diverting in and of themselves.

## DISCUSSION

Our first division is between those terms based on *structural* and those based on *functional* criteria (cf. the anatomy/physiology distinction). The most transparent of medical terms, at least to those with a little Latin or Greek, are those which name objects that are in some way similar in structure to the bone or organ in question. Examples range from the mundane, as in the terms *xiphoid* (Greek, 'sword-like') and *manubrium* (Latin, 'handle') for two parts of the sternum, to the rather more fanciful, such as the *hippocampus* (from the Latin for 'seahorse' — see Figure 1 for the resemblance, in case this isn't altogether clear).

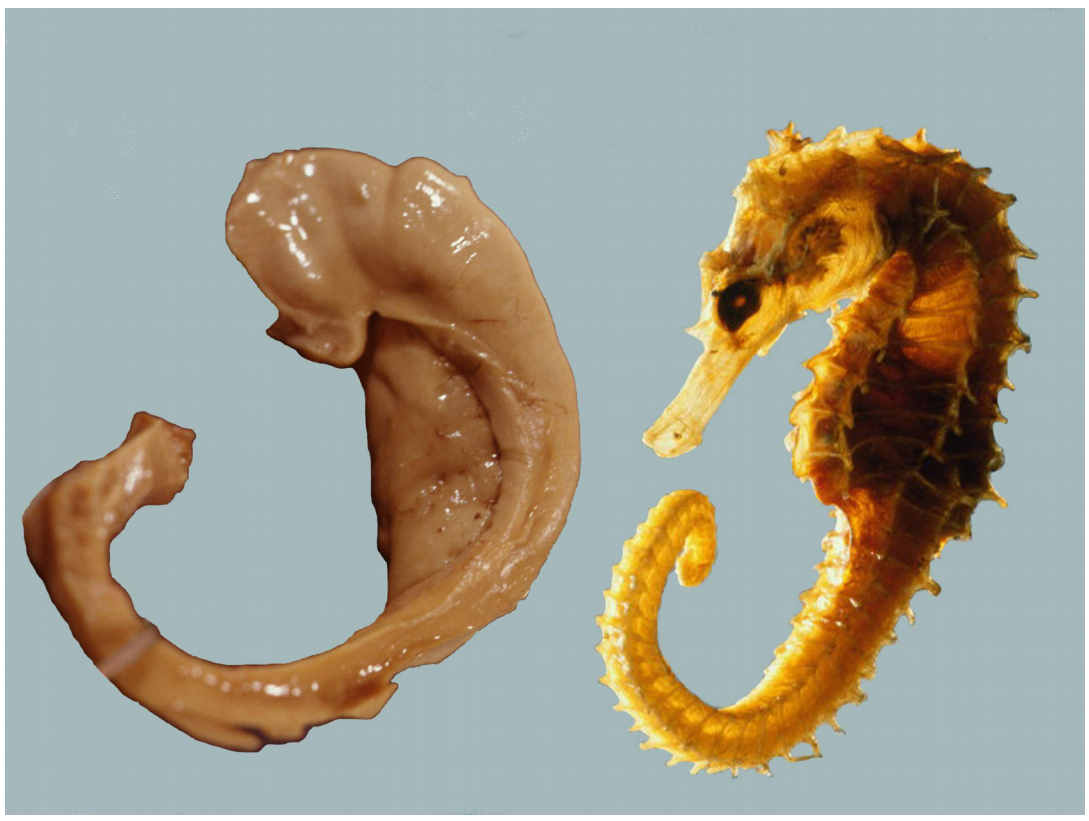

FIGURE 1: Laszlo Seress' preparation of a human hippocampus alongside a sea horse.[11]

This resemblance can involve many structural factors, such as size (e.g. *maximus* in *gluteus maximus*, from the Latin for 'largest'; *gluteus* comes directly from a Latinised form of the Greek *gloutos*, meaning 'rump', 'backside', or, in the plural, 'buttocks'), shape (e.g. *thyroid*, from Greek *thyreoiedes*, 'shield-shaped'), colour (e.g. *erythrocyte*, from the Greek *erythros*, 'red' + *kytos*, 'hollow vessel'), number (e.g. the *biceps*, from Latin *bi-*, 'two' + a combining form of *caput*, 'head'), position (e.g. *epiglottis*, from Greek *epi-*, 'on (top of)' + a variant form of *glossa*, 'tongue'), or tactile

properties (e.g. *sclera*, from Greek *skleros*, 'hard'). Thus, although the resemblance may be more or less obvious (how much exactly does the scaphoid look like a small boat (from Greek *skaphe*, 'skiff', 'small boat'), for example?), the principle is clear.

One interesting subset of the structural terms on which we wish to dwell briefly is what we might call *grammatoid nomenclature* (from the Greek for 'letter-like'): a set of terms which are based on resemblance to characters of the Greek alphabet. Examples include the deltoids, which, in their (vaguely) triangular shape, resemble a capital delta (Δ), and optic or genetic chiasma, both of which involve a crossing over (of nerves or chromosomes), after the letter chi (X). They also include the linguistic abnormalities gammacism, rhotacism and sigmatism. These refer to processes, not structures, but we nonetheless call them structural since they are named after a (conventional) *visual* symbol used to represent the class of sounds that the sufferer has difficulty in pronouncing. A full list is given in Table 2.

| Greek letter | Medical term | Notes |
|---|---|---|
| Delta | deltoid | Resembles an upper-case delta (Δ) |
| Gamma | gammacism | Difficulty pronouncing velar (*g*- and *k*-like) sounds; gamma (Γ, γ) is the letter used to represent the *g* sound in Greek (and, in the right contexts, it could sometimes be pronounced as the voiceless counterpart *k*, usually represented by kappa (Κ, κ)) |
| Lambda | lambdoid (suture) | Resembles a lower-case lambda (λ) |
| Rho | rhotacism | Difficulty pronouncing rhotic (*r*-like) sounds; rho (Ρ, ρ) is the letter used to represent the *r* sound in Greek |
| Sigma | sigmoid (colon) | Bends or curves in a way similar to an upper-case sigma (Σ) |
| | sigmatism | Difficulty pronouncing sibilant (*s*-like) sounds; sigma (Σ, σ) is the letter used to represent the *s* sound in Greek |
| Upsilon | hypsiloid | Meaning resembles either an upper- or lower-case upsilon (Υ, υ) |
| Chi | chiasma | Involves a crossing over, like both upper- and lower-case chi (Χ, χ) |

TABLE 2: Grammatoid nomenclature

Returning to our classificatory system, in complement to the structural terms, we have the functional ones. These name something not on the basis of (properties of) its structure, but rather on what it does. Examples once again range from the relatively straightforward, such as 'duct' (from Latin *ducere*, 'to lead', 'to draw'), to the rather more inspired, such as the gubernaculum (from the Latin for 'rudder', ultimately from *gubernare*, 'to steer', owing to its role in guiding the testes to their place in the scrotum). (Incidentally, this root also gives us the English word 'governor', and its adjectival form 'gubernatorial', which might otherwise seem anomalous.)

Aside from the structural-functional distinction, the second axis of variation is in the level of directness. We have looked so far at names which are relatively direct; that is, the visual resemblance is immanent and immediate, or the functional description names the actual (or perceived) function of the organ itself. We will call these names *literal*. There are also, however, more indirect names — those which do not describe the object in question directly, but rather do so via some associated image or function, or through what appears to be a Kipling-esque 'Just So' story. These names we will call *metaphorical*.

An example of a metaphorical structural name would be 'pupil'. This comes from the diminutive of the Latin *pupa*, meaning 'doll'. Now, obviously the black dot of the pupil does not resemble a doll. However, the image of the person looking into the pupil which is reflected in the cornea does. (Indeed, this naming phenomenon is not unique to Latin and those languages which borrowed from it: it is found in all Indo-European languages as well as in some others, such as Swahili, Lapp, and Samoan[12–13].)

The metaphorical functional names are perhaps the most interesting. They often involve an implicit narrative, or an association between a part of the body and some archetype or stereotype. The Atlas bone, discussed above, is one such example. Another is the sartorius muscle, the longest muscle in the body, found in the thigh. The name comes from the Latin *sartor*, 'tailor', and is related to the traditional cross-legged sitting stance of tailors at work (this position is still called 'tailor pose' in yoga), since it is involved in rotating the hip and bending the knee in ways which are necessary for this posture. A final example is the philtrum, the small groove under the nose, which derives ultimately from the Greek *philtron*, meaning 'love potion'. This name is certainly suggestive, and the received wisdom seems to be that the Greeks found this part of the body particularly erogenous (see e.g. Hennekam et al. 2009: 72), though we know of nothing to substantiate this.

## CONCLUSION

The foregoing discussion can be summarised in Table 3, which gives examples of each category.

| | **Literal** | **Metaphorical** |
|---|---|---|
| **Structural** | xiphoid | pupil |
| **Functional** | gubernaculum | sartorius |

TABLE 3: A four-way categorisation of medical etymology

We believe that this gives the first steps towards a typology of medical terminology (at least for those words of Classical origin), which is of interest both from an abstract, philological point of view, and from the point of view of the practical study of medicine. While our system might not make awkward-sounding Latinate words any easier to memorise, it might at least make them seem less daunting, by reducing the logical space of possible meaning types. We also hope this might inspire others to examine the structural properties of the medical lexicon in more detail.

## References


1. OED Online [Internet]. Oxford University Press [updated June 2013; cited 26 July 2013]. Available from: http://www.oed.com/.
2. Ffrangcon, R. Medical Terms: Their Origin and Construction. 5th Edition. London: Heinemann Medical; 1971.
3. Casselman, B. A Dictionary of Medical Derivations: the Real Meaning of Medical Terms. New York, London: Parthenon; 1998.
4. Haubrich, W. S. Medical Meanings: a Glossary of Word Origins. 2nd Edition. Philadelphia: American College of Physicians; 2003.
5. Lewis, C. T. and C. Short (eds.). A Latin Dictionary. Oxford: OUP; 1879. Available online at http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.04.0059.
6. Liddell, H. G., R. Scott, H. S. Jones and R. McKenzie. A Greek-English Lexicon.9th Edition. Oxford: OUP; 1996. First edition available online at https://openlibrary.org/works/OL2947300W/A_Greek-English_Lexicon.
7. Tindall, A. R. Medical Terms: Their Roots and Origins. Revised 2nd Edition. Hastings: Alethinos Press; 2008.
8. Scarborough, J. Medical and Biological Terminologies: Classical Origins. Norman: University of Oklahoma Press; 1992.
9. Hesiod. Theogony. Ll. 517–520.
10. Lemprière, J. Lemprière's Classical Dictionary. Revised Edition. London: Bracken; 1994.
11. Image taken from Wikimedia Commons [Internet]. Professor Laszlo Seress [retrieved 12 August 2013]. Available from: http://commons.wikimedia.org/wiki/File:Hippocampus_and_seahorse.JPG. This file is licensed under the Creative Commons Attribution-Share Alike 1.0 Generic license (http://creativecommons.org/licenses/by-sa/1.0/deed.en).
12. Steiner, G. After Babel: Aspects of Language and Translation. 3rd Edition. Oxford: OUP; 1998. P. 107.
13. Tagliavini, C. Di alcune denominazioni della pupilla [On some names for the pupil]. In *Annali dell' Istituto Universitario di Napoli*. 1949.