

# Analgesia and Anesthesia: Etymology and Literary History of Related Greek Words

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**G**reek is a particularly cultivated language and has been used to express and refine philosophical and scientific concepts for more than 30 centuries. It is not by chance that international scientific language has formed, and continues to form, many of its terms by borrowing Greek roots, words, or word parts (1). The ancient Greeks were preoccupied with what we now call the “theory of language.” Plato, in his dialogue *Kratylus*, examined the history of names and claimed that words, as names of things, were directly connected with the objects they indicated (2). If we learned the names of things, therefore, we could easily understand the things themselves, because the study of the language then formed the only method of scientific research and discovery (2). Today, the original meaning and use of current medical terms in ancient Greece is not widely known. In this article, the etymological, linguistic, and literary aspects of words of Greek origin, used in current anesthetic practice, are examined. The described words of Greek origin are presented in Table 1 with their Greek spelling, meaning, and etymology.

## Opium and Analgesia

Opium is a Middle English word (c1100–c1500 AD) of Greek origin that passed through Latin into English (3). *Opium* is a diminutive of the ancient Greek *opos* “milky juice of plants”<sup>1</sup> + the Latin ending *-ium*, equivalent to the Greek *-ion* (3,4) and is most probably derived from the ancestral Indo-European root *\*sok<sup>w</sup>-os*,<sup>2</sup> “juice” (1). Opium is obtained from the milky exudate of the incised unripe seed capsules of the

poppy plant, *Papaver somniferum*, dried in the air to form a brownish gummy mass, and then further dried and powdered (5). The poppy capsules that adorn the headdress of the *goddess of poppies*, with five to six lozenge-shaped vertical cuttings (Figure 1), suggest that the methods of harvesting opium in the Late Bronze Age (c1500 BC) in Crete were not much different from those used today (6). Ancient Greeks called *mekon* “the opium poppy,” from the Indo-European root *\*māq(en)-*, and its “milky juice” *mekoneion* (4,7). Homer, in the *Iliad* (8), was the first to use the word “mekon.” He compares the drooping head of Gorgythion, son of Priam, who was struck by a bow, with the inclining head of mekon, heavy from its seeds and the spring droplets.<sup>3</sup> Thucydides (c460–c400 BC) refers to the mekon juice as lethal (9), whereas Nicandros<sup>4</sup> much later (2nd century AD) describes the side effects of mekon and presents the etymology of mekon as derived from the words *me* + *konein* “not to act” (10), denoting that opium prohibits physical action.

The names of the five main alkaloids of opium—morphine, codeine, thebaine, papaverine, and narceine—stem from ancient Greek words. Morphine, the main active ingredient of opium, was named by Sertürner in 1803 (5) after *Morpheus* (*Μορφεύς*), the mythological god of dreams, son of the god of sleep *Hypnos* (3), who assumed different appearances in dreams (1). *Morpheus* is derived from the ancient Greek *morphe* “form, external appearance” + the Latin ending *-eus* (3,4). *Morphine* first took the Latin name *morphia* or *morphina*, passed into English as *morphine* and returned into Greek in 1874. The semisynthetic derivative of morphine, heroin, stems from the Greek *heroine*, which is the female of hero, probably from its effects on the user’s self-esteem and the vivid hallucinations it induces (1,3,7). The word

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<sup>1</sup>The English meaning of the words is given in quotation marks.

<sup>2</sup>The asterisk (\*) is put in front of the Indo-European root to denote the nontested type that once was formed but then disappeared.

<sup>3</sup>Ref. 8; Rhapsody VIII, verse 306: “And he bowed his head to one side like a poppy (*μηκων*)”

<sup>4</sup>The Greek ending “-os,” equivalent to the Latin ending “-us,” will be used in all relevant names or words of Greek origin.

**Table 1.** Summary of the Words of Greek Origin Presented in Alphabetical Order with Their Greek Spelling and Meaning and Their Etymology

Words of Greek origin	Greek spelling	Meaning in Greek language	Etymology (derived from)
Aesthesia (in plural, aestheses)	αίσθησις (αισθήσεις)	Sense(s)	Aesthanomae (αισθάνομαι), derived from aesthomae (αίσθομαι)
Aether	αιθήνη		The verb aetho (αίθω)
Algesis	άλγησις	Pain	Algos (άλγος)
Algos	άλγος	Pain	The verb alego (α + λέγω)
Allodynia	αλλοδνία	Pain from nonnoxious stimulation	Alle (άλλη) + -odyn(ia), derived from odyne (οδύνη)
Anaesthesia	αναίσθησία	Want of feeling	Anaesthetos (αναίσθητος), derived from an negative + aesthesis (αν + αίσθησις)
Analgesia	αναλγησία	Not sensing pain	An negative + alges(is) + -ia
Anodyne	ανώδνως	Anything that relieves or allays pain or distress	An (αν) negative + -odyn(ia), derived from odyne (οδύνη)
Atropine	ατροπίνη		Latin atropa, derived from the Greek atropos (άτροπος), derived from a negative + trope (τροπή)
Codeine	κωδείνη		Kode[ion] (κωδείον or κώδνον), derived from koos (κώος), + -ine
Coma	κόμα	Deep sleep, lethargy	Keimae (κείμαι), changed into koemomae (κοιμώμαι)
Heroin	ήρωίνη, ήρωίδα	Female of hero	Hero (ήρω)
Hyoscyamos	νοσκάμος	The hog bean	Hynos, genitive of hys(vos) "hog" + kyamos (κνάμος)
Hypnosis	ύπνωση	Artificial sleep	Hypnos (ύπνος) + -osis,
Ischialgia	ισχναλγία	Pain of the hip	Ischi(on) (ισχίον) + algos
Karotid(es)	καρωτίδες	Carotids, vessels that bring the blood from the heart to kara "the head"	The verb karoo (καρώ)
Karosis	κάρωση	The induction of stupor by pressure on both carotids	The verb karoo (καρώ)
Kefalalgia	κεφαλαλγία	Headache	Kefale (κεφαλή = head) + algos
Lethargy	λήθαργος	Forgetfulness	Lethe (λήθη) + argos (αργός)
Mandragoras	μανδραγόρας	Mandrake	The name of an ancient physician, or the Persian name of the plant merdum gjjā
Mekon	μήκων	Opium's poppy	Me + konein (μη κοιείν)
Mekoneion	μηκώνειον	Poppy's milky juice	Mekon
Morphine	μορφίνη		Morph(eus) from morphe (μορφή) + -ine
Myalgia	μναλγία	Muscle pain	Mys (μυς) + algos
Narcaine	ναρκαίνη		Narke (νάρκη) + -ine
Narkosis	νάρκωσις	Numbness	The verb narkoo (ναρκώω)
Neuralgia	νευραλγία	Pain along a nerve	Nerve (νεύρο) + algos
Nystagmus	νυσταγμός	Sleepiness, involuntary eyeball oscillations	Verb nystazo, derived from nefstazo (νευστάζω) or nevo (νεύω)
Opium	όπιον	The inspissated juice of a poppy	Opos (όπος) + -ion
Osfalgia	οσφναλγία	Pain of the loin, lumbago	Osfys (οσφνς) + algos
Pain	πόνος	Pain	Middle English peine, derived from poena, a loan from Greek poine (ποινή)
Papaverine	παπαβερίνη		From Latin papaver + -ine
Pododynia	ποδοδνία	Neuralgia of heel and sole	Pode (πόδι) + -odyn(ia), derived from odyne (οδύνη)
Thebaine	θηβαίνη		Latin theba[ia] + -ine
Thio	θειό	Sulphur	Theion (θειόν) used as first compound
Toxicon	τοξικόν	Toxic	Tox(on) (τόξον) + -ikon, derived from Mycenaean to-ko-so, from Scythic tax 'sa



**Figure 1.** The goddess of poppies (c1300–c1250 BC) with a series of well slit poppy capsules, stained brown like opium, in her hair. Archaeological Museum of Heraklion.

passed into Latin (*heroine*), from Latin into French, and then into English, from which it was returned into Greek.

The word for the other natural opium alkaloid, codeine, is also of Greek origin and is derived from the word *kode(ion)* “poppy head” + *-ine* (4). *Kodeion* originates from the Greek word *koos* “cavity or objects of spherical shape” (7). In the *Iliad*, Homer compares the cut head of the Trojan Ilioneus, nailed on a spear by Peneleos, with the poppy head (8).<sup>5</sup> Thebaine, the word for the other phenanthrene alkaloid, is derived from the Latin word *theba(ia)* “opium of Thebes of Egypt” + *-ine* (3), and the word papaverine, the benzyloquinoline alkaloid, is derived from the Latin *papaver* “poppy” + *-ine* (3), from which the Greek *paparouna* “poppy” originated (1). The other alkaloid, narcaine, is of Greek origin from *narke* “numbness” + *-ine*, which passed into Latin as *narce* (3).

Toxic is another ancient Greek word, derived from *toxicon* “bow poison,” originally the shorter form of *toxicon pharmakon* and equivalent to *tox(on)* “bow” + *-ikon* and *toxa*, which in the plural means “arrows” (1,3). The word *toxon* derives from the Mycenaean word *to-ko-so*, which may have been borrowed from the Scythic *tax’sa* (11), when the word did not have the meaning of poisonous. *Toxon* passed into Late-Latin as *toxic(us)* “poisonous” and then into English and French. The *toxon* was the main weapon of the Scythians who smeared

their arrows with a pernicious poison that the ancients called *scythicon* or *toxicon* (4,11,12). It is noteworthy that, although the word *pharmakon* “drug,” is of uncertain origin, in the Homeric times, it meant any medicinal herb with healing properties; afterward, it also meant *pharmaki(on)* (φαρμάκιον) “poison” (1).

The ancient Greek word analgesia is derived from the adjective *analgetos* “not sensing pain,” stemming from *an* negative + *alges(is)* + the ending *-ia* (1,3). *Algesis* “pain” descends from *algos* “somatic or psychic pain,” probably derived from the verb *alego* “to care, look after” (1). Today *algos* is used in compound medical terms such as *myalgia* “muscle pain,” *neuralgia* “pain along a nerve,” *kefalgia* “headache,” *osfyalgia* “back pain,” *ischialgia* “ischiatric pain,” etc. (1). The word pain descended from the Middle English word *peine* (from Old French), which is derived from the Latin word *poena* “penalty,” a loan from the Greek word *poine* “penalty” through the Indo-European root *\*puoinā* (1,3,4). We can assume that the suffering of pain was considered punishment for evildoing (4) or that many ancient Greeks considered diseases to be penalties sent by gods. Another Greek word for “strong psychic pain” is *odyne*, from which *-odyn(ia)* is derived. It is used in the formation of compound words, such as *allodynia* “pain from nonnoxious stimulation,” *pododynia* “neuralgia of heel and sole,” *anodyne* “anything that relieves or allays pain or distress,” etc. (1,3).

## Sleep and Anesthesia

A word for the artificially induced sleep, hypnosis, appeared in the Greek language in 1851, and came from English (1). It is derived from the Greek word *hypnos* “sleep” + *-osis*, from the Indo-European root *\*swp-nos*, cognate with Old English *swefn* and Latin *somnus* (1,3,7). According to the *Iliad* (8) and Hesiod’s *Works and Days* (13), *Hypnos* (Sleep) and *Thanatos* (Death) were powerful gods, twin brothers<sup>6</sup> (Figure 2), sons of the goddess *Nychta* “night.” In ancient vase paintings, *Hypnos* is presented as a young man with wings who brought sleep by moving his wings or by sprinkling oblivion’s dew from a branch or even by pouring hypnotic juices from a horn. Ovidius, in the *Metamorphoses* (14), describes the garden of mekones, in the palace of *Hypnos*, from where *Nychta* collected *nystagmos* (probably meaning opium’s dew) and spread them together with darkness all over the world.<sup>7</sup> The word *nystagmos* is of uncertain origin and most probably is derived from the Greek verb *nystazo*

<sup>6</sup>Ref. 8; Rhapsody XIV, verse 231: “There, she (Hera) met Sleep, the brother of Death.” and Rhapsody XVI, verses 672 and 682: “and gave him (Sarpidon) to swift conveyors . . . the twin brethren, Sleep and Death, who set him speedily in the rich land of wide Lycia.”

<sup>7</sup>Ref. 14; XI 605–607: “ante fores antri fecuda papavera (mekones) florent innumeraeque herbae, quarum de lacte soporem Nox legit et spargit per opacas (νυσταγμούζ) umida terras.”

<sup>5</sup>Ref. 8; Rhapsody XIV, verses 496–499: “and holding it on high like a poppy-head (κώδειαν ανασγών) he showed it to the Trojans.”



**Figure 2.** The decoration of a red-crusted Attic crater (c515–c510 BC) presenting the twin brothers *Hypnos* (on the left) and *Thanatos* (on the right) carrying the dead Trojan hero Sarpedon to his country Lycia (Ref.8; Rhapsody XVI, verses 672 and 682). New York Metropolitan Museum of Art.

“to feel sleepy,” which comes from the verbs *nefstazo* or *nevo* “to nod” (1,3) or, according to Homer, “to bend the head” (15).<sup>8</sup> It was much later, during the eighteenth century, that the word *nystagmos* acquired its current medical meaning as involuntary eyeball oscillations.

The Greek word *anesthesia* “want of feeling,” is derived from the Greek adjective *anaesthetos*, and later passed as a loan word into other languages (1,3). *Anaesthetos* is a compound word *an* negative + *aesthesis* “without feeling, senseless” (4). The word *aesthesis* derives from the verb *aesthanomai* “to perceive through the senses,” from the ancient Greek word *aesthoma* “to perceive” originating from the Indo-European root *\*awis-dh-* (1) or *\*αFισ-θ-* (7). Plato (427–347 BC), in *Philebus*, uses the word *anesthesia* with a philosophical meaning as “the oblivion of the soul from the movements (senses) of the body” (2,16). Aristotle (384–322 BC) in the definition of *Ethics* also describes the words *anesthesia* as opposite to “debauchery and prudence,” and *analgesia* as opposite to “anger and gentleness” (17). In his work *Memory and Recollection*, Aristotle differentiates faintness “weakness of the senses” from *anesthesia* (18). He claims that *hypnos* and *egrigorsis* “vigilance,” are both conditions of the *esthetic*, arising from a center located in the heart that controls movement and the senses (18). The ancient adjective *esthetic* means “pertaining to the senses” (*aesthetes*) as opposed to pure intellectuality (1,3,4). During sleep, people do not sense the outside world or perceive through the senses (*estheticon*), which means they have *anesthesia* (18).

The ancient Greek word *koma* “deep sleep, lethargy, coma” is of uncertain origin and is most probably derived from the Indo-European root *\*kō[i]-mn*, from which the verb *keimai* “to lie” was derived and then changed into *koemomai* “to sleep” (1,4,7). The word *coma* is used by Homer with the meaning of deep sleep

(8,15).<sup>9</sup> Aristotle described very accurately “the induction of stupor by pressure on both carotids” as *karosis* (17). *Karosis* “stupor” stems from the verb *karoo* “to cause soporific stupor,” from which the Greek *karotid(es)* “carotids” is derived, because they bring the blood from the heart to *kara* “the head” (1,3,4,7). Hippocrates (c460–c360 BC) uses the word in connection with trauma to denote “lack of consciousness” (19), whereas the lexicographer Hesychius (2nd century BC) uses the participle *carotheis* to describe “the person whose head is shaken,” an accurate description of a clinical condition, concussion (8).

In his pharmacological and pharmaceutical work *De Materia Medica* (published in 77 AD), the Greek naturalist Dioscorides was the first to use the word *anesthesia* in the context of surgery. He describes the hypnotic effects of a preparation in wine of *mandragoras* “given to those who are going to be cut or burnt (cauterized) and wish to have anesthesia” (20,21).<sup>10</sup> The ancient Greek word *mandragoras* is of uncertain origin and is probably derived either from the name of an ancient physician (7) or from the Persian name of the plant *merdum gijā* “plant of man” (1). The Middle English *mandrake* is a variant of *mandrage*, short for *mandragoras* (3), and refers to *Mandragoras officinarum* containing solanaceous alkaloids. It was included as a soporific agent in pharmacopoeias and herbals until the end of the 17th century, when its male and female forms were clearly explained by Linnaeus (1707–1778). Probably, this is why O. W. Holmes suggested to W. T. G. Morton the name *anesthesia* for his historical discovery, referring to its use by Linnaeus as “lack of the sense of touch” (22).<sup>11</sup> Linnaeus also named the shrub *Atropa belladonna* after *Atropos*, the oldest of the three ancient Greek Fates who cut the thread of life (3). The Latin word *atropa* is derived from the ancient Greek word *atropos* from the negative *a* + *tropē* “no turning” hence “inflexible, unchangeable, implacable, deadly.” Another member of the botanical family of the Solanaceae plants is *Hyoscyamos niger*, popularly known as “henbane,” from which the alkaloids hyoscyamine, atropine, hyoscyne, and atropine are produced. The word *hyoscyamos* is a compound Greek word, derived from *hyos* (genitive of *hys*) “hog” + *kyamos* “bean,” meaning “the hog

<sup>9</sup>Ref: 8; Rhapsody XIV, verse 359: “for over him have I shed soft slumber (κόμα).” Ref.15; Rhapsody XVIII, verse 201: “in my utter wretchedness soft slumber (κόμα) enfolded me.”

<sup>10</sup>Ref. 20; “και εφ’ων βούλονται αναίσθησιαν (anesthesia) τεμνομένων ή καιομένων ποιήσαι.”

<sup>11</sup>Ref. 22; “Everybody wants to have a hand in a great discovery. All I will do is to give you a hint or two as to names—or the name—to be applied to the state produced and the agent. The state should, I think, be called ‘Anesthesia.’ This signifies insensibility—more particularly (as used by Linnaeus and Cullen) to objects of touch. The adjective will be ‘Anesthetic.’”

<sup>8</sup>Ref. 15; Rhapsody XVIII, verse 240: “hanging his head (νευστάζων) like a drunken man.”

bean" (3). The other historic name, *Lethéon*, given by Morton to ether, is derived from *lethe* "oblivion," from the verb *lanthano* "to be latent" (1,22). *Lethe* also forms the first part of the compound word of Greek origin *lethargy* derived from *leth-* + the adjective *argos*, which originally meant "forgetful" (1,3,4). According to Greek mythology, whoever drank from the river *Lethe* in Hades forgot his past on the earth.

Narcosis, a term until recently used as a synonym to anesthesia, is an ancient Greek word *narkosis* "state of unconsciousness or drowsiness produced by a drug" (1,3). It comes from the verb *narkoo* "to grow stiff or numb," which is derived from the noun *narke* "temporary decline or loss of senses and movement, numbness," stemming from the Indo-European root *\*(s)nrq-ē* (1,4,7). In the VIII Rhapsody of the *Iliad* (8), Homer describes very accurately a traumatic injury to the brachial plexus by a jagged stone thrown by Hector, which "traumatized Teukrus above the clavicle and his hand dropped as if narcotised."<sup>12</sup> Hippocrates refers to the words *narkae* and *anesthesiae* as symptoms of the apopleptic patient from strangulating *eileus* "ileus" (23). Menon, in the synonymous dialogue of Plato, says disapprovingly of Socrates that "he *narcoses* (*narkan*) the thought of people, like the fish *narke* narcoses its victim" (1,2,24). It is not until the time of Galen (138-201 BC) that the word is used in relation to drugs, and not only to trauma or fish poison.

The first volatile anesthetic, diethyl ether, was given the name of *aether* by Froben in the 18th century (25). *Aether* is an ancient Greek word derived from the verb *aetho* "to burn," descending from the Indo-European root *\*aidh-* "glow" (1). Ancient Greeks presumed that *aither(es)* was the medium that filled the upper regions of space. The word passed as a loan through the Latin *aether* "upper air, pure air," to other languages (French *éter*, English *aether*, Italian *etere*, etc.) (1,3). The widely used IV anesthetic thiopentone is a compound word having as a first component *thio* "sulfur," derived from *theion* stemming from the Indo-European route *\*θFéeros* "smoke" (1). It is used in chemical nomenclature to indicate the replacement of part or all of the oxygen atoms in a compound by sulfur (3).

In conclusion, the linguistic and literary aspects of the described medical terms outline the roots of analgesia and anesthesia in the ancient Greek world. The evolution of these words through the ages, either unchanged or with different meanings, and their use by modern anesthesia displays the diachronic qualities of the Greek language and culture. The best example is the word *anesthesia*, which had

been used to mean "loss of sensation and consciousness," many centuries before its use for a pharmacological and scientific phenomena.

<sup>12</sup>Ref. 8; Rhapsody VIII, verse 329: "but his hand grew numb (*νάρκησε*) at the wrist."

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