LATIN FOR PHARMACY STUDENTS

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Latin for Pharmacy Students

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Preface

You are holding a special Latin book written for the Pharmacy students of the University of Debrecen. It is indispensable both for doctors and pharmacists to know the *lingua Latina medicinalis* in their jobs, but as there are quite a lot of differences between the two professions, different sections of this language must be highlighted when teaching it. It was this aspect that I tried to concentrate on while compiling the material, paying special attention to the terms and expressions that are dominant in pharmaceutical practice.

This book is based on communicative language teaching methods aiming at the presentation of basic Latin grammar and vocabulary as well as its practice and production. However, due to the characteristic features of this specialist language, I did not focus on oral communication but mainly on the practice and correct production of this special vocabulary and grammar. The presentation based on realia is followed by less and less controlled practice making students able to freely produce the language of Pharmacy as well as read prescriptions and formulate preparations as prescribed.

As I concentrated on practical aspects, the book is not aimed at presenting the whole Latin grammar. Therefore I chose to only use the term 'stem' when presenting the declensions and adjective formation and I did not present the exceptions that are not so important for future pharmacists either.

I would like to express my gratitude to Dr. Szabó Attila pharmacist, who helped my work with plenty of useful information and specialist knowledge, and my husband, Dr. Takács Levente, who provided me with advice in compiling the grammatical parts and made it possible for me to write this book. Special thanks to Dr. Lampéné Dr. Zsíros Judit for her encouragement and help.

I hope the book will prove to be useful and will also be considered helpful in the course of Pharmacy students' later studies.

Dr. Takácsné Tóth Emőke

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THE LATIN ALPHABET

The Latin language used the Latin alphabet we still use today and it originally comprised the following 21 letters: ABC DEF GHI KLM NOP QRS TVX. The letters Y and Z, which got into Latin through words borrowed from Greek, became part of the alphabet only later. The Latin alphabet, which only used capital letters, did not include the letter U or J either; they only appeared later to distinguish the sounds [j] and [i], and [v] and [u].

Originally there were no diacritical marks in Latin. However, the dictionaries, lexicons and coursebooks used today show the lenght of vowels by using certain marks (e.g. $\bar{a} \ \bar{e} \ \bar{i} \ \bar{o} \ \bar{u}$ for long vowels and $\check{a} \ \check{e} \ \check{i} \ \check{o} \ \check{u}$ for short ones) to enhance the correct pronunciation and accentuation of words especially when lenght bears difference in meaning as well. (e.g. $\bar{o}s = \text{bone}, \ \bar{o}s = \text{mouth})$

Letter Pronunciation Example arteria, ligamentum like Hungarian [á] а like Hungarian [é], but pronounced separately in some aeteroleum, aerophagia ae cases [ts] before the letters *i* or *e*, and [k] in the rest of the cases cilium, capillus, cutis, facies с choleductus ch [k] [e] or like Hungarian [é] tendo, vena e [i] or [i:], but [j] between two vowels or at the beginning pilus, ieiunum, maior i of a word if folowwed by a vowel [0] or [0:] os, hora 0 like Hungarian [ő], but pronounced separately in some oe oedema, dsypnoe cases pharmacologia ph [f] [s], which later developed into [z] in some of the words nervus, causa, transversalis S th [t] apotheca [ti] in most of the cases (and always after s-, t-, x-), but cartilago, articulatio ti [tsi] before vowels musculus, supercilium, lumen u [u] or [u:] originally like Hungarian [ü], which later developed into hypertonia, hypotermia у [i]

The pronunciation of Latin letters

Read out the following words according to the Latin pronunciation used in Hungary:

tabletta, comprimata, oleum, cortex, viginti, flos, formula, lac, stomachus, rhinitis, suppositorium, liquor, solutio, adiuvans, gramma, rhizoma, leukaemia, otitis, cysta, aqua, scatula, antacidum, melissa, chamomilla, caput, sulphur, Pharmacopoea Hungarica editio octava, Pharmacopoea Europeana editio septima, Formulae Normales (FoNo), medicamentum, invocatio, recipe, praescriptio seu ordinatio, subscriptio, signatura, adscriptio, receptum

INTRODUCTION INTO PHARMACEUTICAL TERMINOLOGY

Extract from the classic translation of the Hippocratic oath:

"I swear by Apollo the Physician and Asclepius and Hygieia and Panaceia and all the gods, and goddesses, making them my witnesses, that I will fulfill according to my ability and judgment this oath and this covenant:...



Asclepius (Latin *Aesculapius*) is the god of medicine and healing in ancient Greek religion. He was the son of Apollo and Coronis. His mother was killed for being unfaithful to Apollo, but the unborn child was rescued from her womb. Apollo took the infant to be raised by the wise old centaur Chiron, who taught him the art of healing. Asclepius became a great physician and surgeon. The goddess Athena gave Asclepius the gift of Medusa's blood. The blood from the veins on the left side of Medusa's head was for the bane of mankind, but Asclepius used the blood from the veins on the right side for saving mankind and for raising the dead. Asclepius' raising of the dead aroused the anger of Zeus. He struck Asclepius dead with one of his thunderbolts, fearing the spread of his miraculous art of healing. Asclepius represents the healing aspect of the medical arts; similar to his well-known daughters Hygieia (the personification of health and sanitation), and Panacea (the goddess of universal remedy).

The rod of Asclepius, a snake-entwined staff, remains a symbol of medicine today. The serpent and the staff appear to have been separate symbols that were combined. The significance of the serpent has been interpreted in many ways; sometimes the shedding of skin and renewal is emphasized as symbolizing rejuvenation, while other assessments center on the serpent as a symbol that unites and expresses the dual nature of the work of the physician, who deals with life and death, sickness and health. The ambiguity of the serpent as a symbol, and the contradictions it is thought to represent, reflect the ambiguity of the use of drugs, which can help or harm, as reflected in the meaning of the term *pharmakon*, which meant "drug", "medicine" and "poison" in ancient Greek. Products deriving from the bodies of snakes were known to have medicinal properties in ancient times, and in ancient Greece, snake venom appears to have been 'prescribed' in some cases as a form of therapy. The staff has also been variously interpreted. One view is that it, like the serpent, "conveyed notions of resurrection and healing", while another (not necessarily incompatible) is that the staff was a walking stick associated with itinerant physicians.

Hermes (identified with the Roman god Mercury), was a god of transitions and boundaries. He was quick and cunning, and moved freely between the worlds of the mortal and divine, as messenger of the gods, and conductor of souls into the afterlife. He was protector and patron of travelers, herdsmen, thieves, orators and wit, literature and poets, athletics and sports, invention and trade. One of his attributes and symbols is the herald's staff, the Latin *caduceus* in his left hand. It represents trades, occupations or undertakings associated with the god. In later antiquity the caduceus provided the basis for the astrological symbol representing the planet Mercury. Thus it has come to denote the elemental metal of the same name. It is relatively common, especially in the US, to find the caduceus, with its two snakes and wings, used as a



symbol of medicine instead of the correct rod of Asclepius, with only a single snake. This usage is erroneous, popularised largely as a result of the adoption of the caduceus as its insignia by the US Army medical corps in 1902. The rod of Asclepius is the dominant symbol for professional healthcare associations in the United States. One survey found that 62% of professional healthcare associations used the rod of Asclepius as their symbol; while 76% of commercial healthcare organizations used the Caduceus symbol. The author of the study suggests the difference exists because professional associations are more likely to have a real understanding of the two symbols, whereas commercial organizations are more likely to be concerned with the visual impact a symbol will have in selling their products.

What do the following pharmaceutical symbols refer to?



Pharmacology (from Greek *pharmakon*, "poison" in classic Greek, "drug" in modern Greek, and *-logia* "study of", "knowledge of") is the branch of medicine and biology concerned with the study of drug action, where a drug can be broadly defined as any man-made, natural, or endogenous (within the cell) molecule which exerts a biochemical and/or physiological effect on the cell, tissue, organ or organism. More specifically, it is the study of the interactions that occur between a living organism and chemicals that affect normal or abnormal biochemical function. If substances have medicinal properties, they are considered pharmaceuticals. The two main areas of pharmacology are pharmacodynamics and pharmacokinetics.

Match the names of study fields and their meaning.

- 1.) pharmacodynamics
- a) treatment of disease with medicines
- 2.) pharmacognosy
- 3.) pharmacokinetics
- b) the interactions of chemicals with biological receptors
- c) discusses the absorption, distribution, metabolism, and excretion of chemicals from the biological systems
- 4.) pharmacotherapy
- d) branch of pharmacology dealing with deriving medicines from plants

Medicines were stored in the *apotheka*, whose name is preserved in the German word for pharmacy (*Apotheke*), or in the Hungarian word *patika*. The English *pharmacy* derives from the Greek word *farmakon*. In Latin there were several words used to denote medicine, such as *remedium*, *medicina*, *medicamen*, *medicamentum*, which all come from the verb *medicor*, *-ari*, *-atus sum* (meaning 'to heal'). The word *medicamen* appeared mainly in poetry, while the word *medicina* was used both for drugs and the study of healing.

cardiologyorthopedicsurologyophthalmologynephrologyotologyoncologyepidemiologypulmonologyhistologydermatologyandrology

What is the subject of the following studies?

Some quotes by Hippocrates:



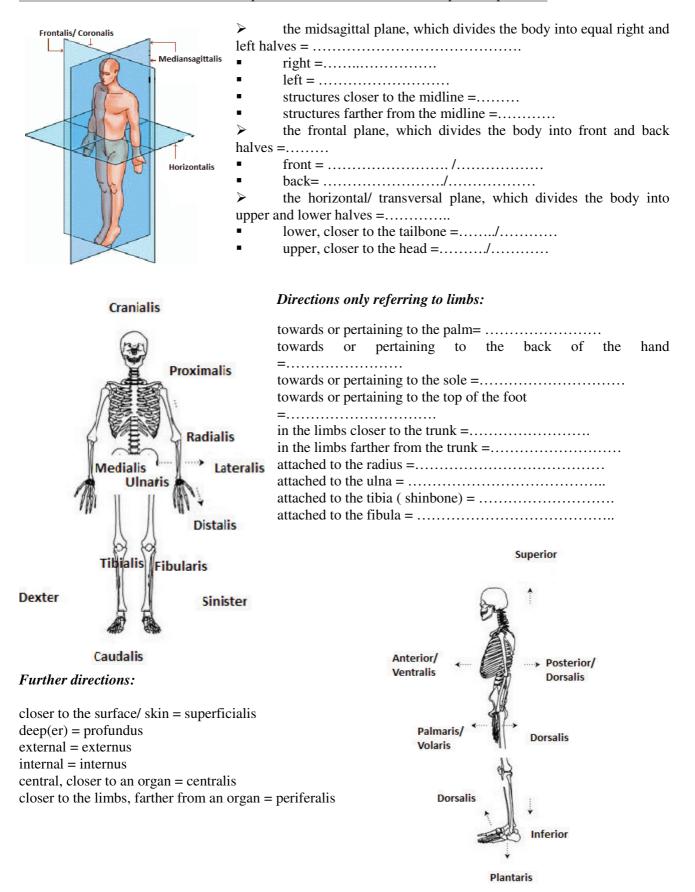
Primum nil nocere Salus aegroti suprema lex esto Ars longa, vita brevis

VOCABULARY

masculinum		femininum		neutrun	ı
capillus, -i m	hair	aqua, -ae f	water	aetheroleum, -i n	volatile oil
choleductus, -us m	bile duct	arteria, -ae f	artery	cilium, -ii n	eyelashes
cortex, -icis m	bark	articulatio, -is f	joint	gramma, -matis n	gram
flos, -oris m	flower	cartilago, -is f	cartilage	ieiunum, -i n	jejunum
liquor, -oris m	liquid	causa, -ae f	cause	ligamentum, -i n	ligament
musculus, -i m	muscle	cutis, -is f	skin	lumen, -inis n	cavity of a
					tubular
					structure
nervus, -i m	nerve	dyspnoe	difficulty breathing	medicamentum, -u n	medicine
pilus, -i m	body hair	facies, -ei f	face, surface	oleum, -i n	oil
stomachus, -i m	stomach	hora, -ae f	hour	os, oris n	mouth
		hypertonia	hypertension	os, ossis n	bone
		tendo, -inis m	tendon	supercilium, -ii n	eyebrows
		vena, -ae f	vein	suppositorium, -ii n	suppository

ANATOMICAL PLANES AND DIRECTIONS

Provide the Latin names of the defined planes and directions with the help of the pictures:



1.1.Are the following statements true or false? Correct the false ones.

In anatomical position the palmar surface is in <i>posterior</i> position.	
The sternum is <i>anterior</i> to the heart.	
The clavicles are <i>medialis</i> to the sternum.	
The elbow is <i>proximalis</i> to the wrist.	
The aorta is <i>ventralis</i> to the spinal column.	
The skin is <i>profundus</i> to the muscles.	
Blood drawn from a fingerstick is <i>peripheralis</i> blood.	

1.2.Find the odd one out and explain your choice.

- a. medialis, superficialis, lateralis, transversalis
- b. plantaris, palmaris, dorsalis, caudalis
- c. ventralis, palmaris, anterior, posterior
- d. volaris, transversalis, mediansagittalis, coronalis

1.3.What are the opposite of the following terms?

volaris	\leftrightarrow	 lateralis	\leftrightarrow	
anterior	\leftrightarrow	ventralis	\leftrightarrow	
inferior	\leftrightarrow	profundus	\leftrightarrow	
cranialis	\leftrightarrow	internus	\leftrightarrow	
dexter	\leftrightarrow	plantaris	\leftrightarrow	
tibialis	\leftrightarrow	ulnaris	\leftrightarrow	

1.4.Provide the synonym of the following terms:

volaris	=	 posterior	=	
anterior	=	frontalis	=	
inferior	=	cranialis	=	

1.5.Fill in the blanks with directional terms:

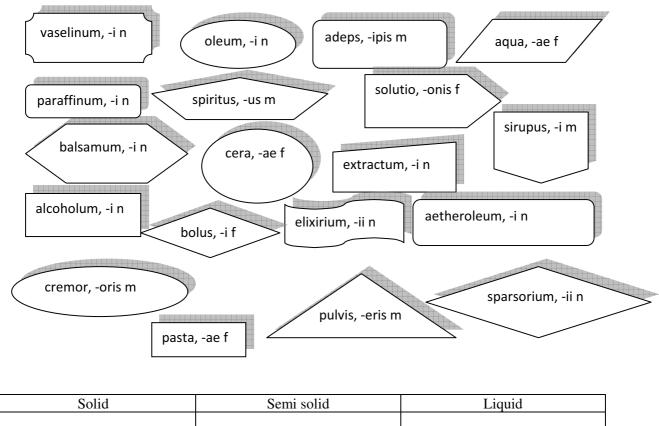
- The spinal column is to the heart.
- The sternum is.....to the heart.
- The heart is to the diaphragm.
- The liver is to the diaphragm.
- The nails are situated at the ends of the fingers.
- The bones are to the muscles.
- The thumb isto the little finger.
- The lungs are to the heart.
- The brain and spinal cord make up the nervous system.

1.6. Translate the names of the following anatomical terms:

musculus internus	facies plantaris
facies anterior	ligamentum posterius
vena inferior	arteria dextra
vena superior	musculus superficialis
musculus profundus	malleolus medialis

GRAMMATICAL GENDER IN LATIN

1.7. Group the following names of materials on the basis of their consistency:



Solid	Semi solid	Liquid

The three grammatical features of all Latin nouns and adjectives are:

- gender (male /masculinum, abbrev. m; female /femininum, abbr. f; or neuter (=neither) /neutrum, abbr. n)
- > number (singular/ singularis or plural/ pluralis)
- case

The dictionary form of Latin nouns consists of three elements. E. g the dictionary form of the word *SOLUTIO*, - *ONIS F* shows us the following information:

- 1. solutio singular nominative case of the noun and it means: solution
- 2. *solutionis* singular genitive/ possesive case (it means *of the solution*), and shows the base of the noun at the same time. (solution-)
- 3. f refers to the gender of the noun. This particular noun is *female*.

1.8. Group the above nouns on the basis of their grammatical gender:

masculinum	femininum	neutrum

Most of the medical and pharmaceutical terminology consists of adjectival phrases (*os longum, aqua destillata*). As adjectives and numerals do not have a gender of their own and they take up the gender of the noun they refer to, , it is important to know the rules that have to be applied when we use nouns and adjectives together in the same phrase, i. e. the rules of gender concord. It means that Latin adjectives must agree in gender, number and case with the noun they refer to. E.g. if an adjective expresses the characteristics of a male noun, it will get a male gender ending, and has to be put in the same case as the noun it refers to.

Adjectives can grouped into three categories according to the number of the endings they have for the different genders in their basic form. **The adjectives with three endings** have separate ending for the three genders, the first one being the male, the second one being the female, while the third being the neutral ending. **The adjectives with two endings** have the same ending for male and female, and a different one for neutral. **The adjectives with one ending** use the same ending for all the three genders.

	masculinum	femininum	neutrum	Dictionary form
with 3	alb us	alb a	alb um	albus 3
endings:	composit us	composit a	composit um	compositus 3
	dexter	dextr a	dextr um	dexter 3

with 2	distal is	distal is	distale	distalis 2
endings:	super ior	super ior	super ius	superior, superius

with 1 ending:	simplex	simplex	simplex	simplex
	conservans	conservans	conservans	conservans

1.9. What are the different gender forms of the following adjectives?

dictionary form	masculinum	femininum	neutrum	meaning
antirheumaticus 3	antirheumatic	antirheumatic	antirheumatic	

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carminativus 3	carminativ	carminativ	carminativ
amarus 3	amar	amar	amar
sinister 3	sinist	sinist	sinist
pectoralis 2	pectoral	pectoral	pectoral
originalis 2	original	original	original
inferior 2	inferi	inferi	inferi
emolliens 1	emollie	emollie	emollie
laxans 1	laxa	laxa	laxa
tricoloratus 3	tricolorat	tricolorat	tricolorat
superficialis 2	superficial	superficial	superficial
triplex 1	tripl	tripl	tripl
talis	tal	tal	tal
solidus	solid	solid	solid
ceratus	cerat	cerat	cerat
destillatus	destillat	destillat	destillat
nasalis	nasal	nasal	nasal
liquidus	liquid	liquid	liquid
papyraceus	papyrace	papyrace	papyrace
fuscus	fusc	fusc	fusc
aequalis	aequal	aequal	aequal
hydrophilicus	hydrophilic	hydrophilic	hydrophilic
lipophilicus	lipophilic	lipophilic	lipophilic

1.10. Provide the correct ending and the meaning of these adjectives:

flavus	f	flav	destillatus	f	destillat	
liquidus	т	liquid	solidus	т	solid	
peruvianus	п	peruvian	sterilis	т	steril	
dilutus	f	dilut	acidus	п	acid	
aequalis	п	aequal	originalis	f	original	
conservans	т	conserva	anisatus	т	anisat	
nasalis	п	nasal	siccus	п	sicc	
coeruleus	т	coerule	ceratus	f	cerat	
amarus	т	amar	fuscus	п	fusc	

1.11.Provide the correct ending of the adjectives in the following phrases:

aqua destillat...vaselinum flav...adeps solid...cera flav...cera alb...balsamum peruvian...solutio conserva...extractum fluid...elixirium composit...solutio steril...

alcoholum dilut... paraffinum solid... vaselinum alb... acidum ascorbic... solutio acid... extractum sicc... sirupus simpl... paraffinum liquid... spiritus anisat... solutio amar....

1.12. Provide the correct ending of the adjectives in the phrases of the second column:

cremor, -oris m	aquosus	cremor aquos
cremor, -oris m	refrigerans	cremor refrigera
hydrogelum, i n	antisudoricus	hydrogelum antisudoric
gutta, -a f	stomachicus	gutta stomachic
formula, -ae f	magistralis	formula magistral

CHAPTER 1 - ANATOMICAL PLANES AND DIRECTIONS

pasta, -ae f	hydrophilicus	pasta hydrophilic
paraffinum, -i n	aromaticus	paraffinum aromatic
pulvis, -eris m	antidoloricus	pulvis antidoloric
sirupus, -i m	laxans	sirupus laxa
remedium, -ii n	adjuvans	remedium adjuva
remedium, -ii n	cardinalis	remedium cardinal
unguentum, -i n	nasalis	unguentum nasal
sparsorium, -ii n	antimycoticus	sparsorium antimycotic
digitus, -i m	anularis	digitus anular
digitus, -i m	medius	digitus medi
digitus, -i m	minimus	digitus minim
extremitas, -atis f	inferior	extremitas inferi
pars, -tis f	aequalis	pars aequal

1.13.Translate into Latin:

yellow wax	original tube
solid fat	equal part
yellow vaseline	white wax
diluted spirit	anise spirit
liquid paraffin	compound elixir
white wax	distilled water
preservative solution	compound syrup
nose ointment	simple syrup
cooling cream	original box
dry extract	bitter tincture

Chemistry terms, like the names of elements, are nearly all neutral. E.g. Natrium, Kalium, Calcium, Sorbitum, Mentholum, Glycerinum, Natrium hydrogencarbonicum, Acidum salicylicum, etc. Similarly, as the expressions denoting the action of medicines were originally adjectives referring to the noun *medicamentum* (which is neutral), became later neutral nouns: Analgeticum, Antipyreticum, Antisepticum or Antisudoricum.

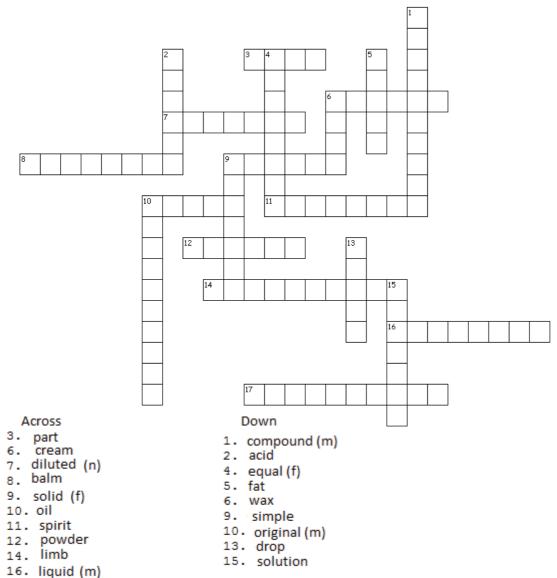
1.14. Provide the correct Latin name:

lactose	pepsin	lidocaine	nystatin	macrogol	paracetamol

1.15. Provide the English equivalent.

Acidum ascorbicum	
Acidum chloratum dilutum	
Acidum salicylicum	
Acidum oleinicum	
Acidum citricum	
Acidum lacticum	
Hydrogenium peroxydatum dilutum 3%	
Alcoholum dilutum 70%	
Fuchsinum	
Acidum boricum	
Vanillinum	

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17. talc-powder

VOCABULARY

Nomina					
masculini	um	femininum		neutrum	
adeps, -ipis m	fat aqua, -ae f water		alcoholum, -i n	alcohol	
cremor, -oris m	cream	bolus, -i f	clay	balsamum, -i n	balsam
digitus, -i m	finger	cera, -ae f	wax	elixirium, -ii n	elixir
pulvis, -eris m	powder	extremitas, -atis f	limb	extractum, -i n	extract
sirupus, -i m	syrup	formula, -ae f	formula, rule	hydrogelum, i n	hydrogel
spiritus, -us m	spirit	gutta, -a f	drop	paraffinum, -i n	paraffin
		pars, -tis f	part	remedium, -ii n	remedy
		pasta, -ae f	paste	sparsorium, -ii n	talc-powder
		solutio, -onis f	solution	unguentum, -i n	ointment
				vaselinum, -i n	vaseline

Adiectiva			
acidus 3	acidic	internus 3	internal
adiuvans	adjuvant, furnishing added support	lateralis 2	farther from the midline
aequalis 2	equal	laxans	laxative
albus 3	white	liquidus 3	liquid
amarus 3	bitter	magistralis 2	here: made in pharmacy
anisatus 3	with anise	medialis 2	closer to the midline
anterior, -ius	front	mediansagittalis 2	midsagittal plane
antidoloricus 3	painkiller	medius 3	middle
antimycoticus 3	destroying fungi	minimus 3	smallest
antirheumaticus 3	antirheumatic	nasalis 2	related to the nose
antisudoricus 3	against sweating	originalis 2	original (here: factory made)
anularis 2	ring-like	palmaris 2	on the side of the palm
aquosus 3	watery	papyraceus 3	made from paper
aromaticus 3	aromatic	pectoralis 2	related to the chest
cardinalis 2	most important (here: active agent)	periferalis 2	closer to the limbs
carminativus 3	carminative (helps remove gas)	peruvianus 3	related to Peru
caudalis 2	closer to the tailbone	plantaris 2	related to the sole
centralis 2	closer to the centre	posterior, -ius	back
ceratus 3	waxy	profundus 3	deep
coeruleus 3	blue	proximalis 2	in the limbs, closer to the trunk
compositus 3	compound	refrigerans	making cool
conservans	preservative	sagittalis 2	sagittal plane
coronalis 2	coronal	siccus 3	dry
cranialis 2	closer to the skull	simplex	simple
destillatus 3	distilled	sinister 3	left
dexter 3	right	solidus 3	solid
dilutus 3	diluted	sterilis 2	sterile
distalis 2	in the limbs, father from the trunk	stomachicus 3	related to the stomach
dorsalis 2	related to the back	superficialis 2	close to the surface
emolliens	emollient, making soft	superior, -ius	upper
externus 3	external	talis 2	such
flavus 3	yellow	transversalis 2	transverse, horizontal
frontalis 2	frontal (plane)	tricoloratus 3	with 3 colours
fuscus 3	dark	triplex 1	triple
hydrophilicus 3	likes water, dissolves in water	ventralis 2	related to the belly
inferior, -ius	lower		