

LVIV NATIONAL DANYLO HALYTSKY MEDICAL UNIVERSITY

Latin language department

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the Latin language
department
protocol № _____**

METHODICAL RECOMMENDATIONS

Latin language and medical terminology basics

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The 1st semester

1	Short history of the Latin language. The alphabet. Vowels and consonants. Pronunciation. Diphthongs.
2	The accent. Length and brevity of the syllable.
3	Review of Latin Nouns. Declensions. Formation of anatomical terms (Sn-Sg). Introduction to the anatomical nomenclature.
4	Review of Latin Adjectives. Two groups. Formation of anatomical terms (Sn-An).
5	Anatomical terms with different kind of modifiers.
6	The 1 st declension of nouns. Greek nouns of the 1 st declension. Prepositions (Acc., Abl.)
7	The 2 nd declension of Nouns. Masculine and neutral genders.
8	The Adjectives of the 1 st and 2 nd declension.
9	The 3 rd declension of Nouns. General information. Three types of Nouns.
10	The 3 rd declension of Nouns. Masculine gender. Exeptions.
11	The 3 rd declension of Nouns. Feminine gender. Exeptions.
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13	The 3 rd declension of Nouns. Irregular Nouns.
14	Adjectives of the 3 rd declension.
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16	The 4 th declension of nouns. The 5 th declension of nouns. Exeptions.

The 2nd semester

1.	Clinical terms. 1 st declination.
2.	Clinical terms. 2 nd declination.
3.	Clinical terms. Adjectives of 1-2 nd declination.
4.	Clinical terms. 3 rd declination. Masculine.
5.	Clinical terms. 3 rd declination. Feminine.
6.	Clinical terms. 3 rd declination. Neutral.
7.	Clinical terms. 3 rd declination. Adjectives
8.	Clinical terminology 4-5 th declination.
9.	Greek and Latin prefixes.
10.	The Verb.
11.	The Verb. Conjunctivus
12.	Latin Chemical Nomenclature.
13.	Prescriptions. Grammatical Structure.
14.	Prescriptions. Liquid Forms.
15.	Prescriptions. Soft Forms.
16.	Prescriptions. Solid Forms.

1 Short history of the Latin language. The alphabet. Vowels and consonants. Pronunciation. Diphthongs.

The Latin alphabet initially contained 21 letters (1st cent. B.C.). But later, due to the necessity to transliterate Greek words, new letters – y (igrek) and z (zet) were added for the reproduction of Greek letters and sounds. In the course of time the specific pronunciation of these letters was lost, but the letters remained in the borrowings of Greek origin.

The Latin alphabet consisting of 26 letters was established in Western Europe since the 16th century. Letters j and v were introduced into practice by Peter Ramus. Also, the letter w was initially used in borrowings, such as geographical and proper names, as well as in medical and pharmaceutical terms.

The pronunciation of vowels

There are six vowels in Latin: a, e, i, o, u, y. The pronunciation of these sounds is similar to the pronunciation of corresponding English ones, though some peculiarities do exist: ána – equally; línea – line; ós – bone; intérnus – internal; inferior – inferior.

I, i - A vowel “i” is pronounced as “i” before and after consonants, e.g.: íta – such, túnica – layer. “I” is pronounced as “j” at the beginning of a word or a syllable, before a vowel and between two vowels. In modern medical and pharmaceutical terminology the letter “j” is used in the above-mentioned cases, e.g.: májor – big, jejúnium – intestine, majális – May*.

N.B.! There is no “j” in the borrowings of Greek origin, because there was no “j” in the Greek language, e.g.: iódium – Iodine (G. iódes – violet), Iodofórmium – iodoform, iódidum – iodide, Iodinólum – iodinole).

Y, y - A vowel “y” is pronounced as “i” and is used only in the borrowings of Greek origin, e.g.: pylórus – pylorus, myológia – mycology.

A twofold writing of such terms is possible: jejunum or iejunum. Besides, in International Medical Terminology the letter J is commonly used.

The Greek prefixes, roots and suffixes containing the letter “y”

The pronunciation of diphthongs

The combination of two vowels is called a “diphthong”. There are the following diphthongs in Latin: ae, oe, au, eu, ou. Diphthongs ae and oe are pronounced as [e]: aegrótus – sick, cóena – meal.

If there are two dots above the second component of the diphthong ae or oe, such combination is not considered as a diphthong. Consequently, each letter should be read separately, e.g., áër – air, Áloë – Aloe, díploë – diploe.

au – au (av) Aúrum – gold

eu – eu (ev) pneumonía – inflammation of lungs

ou – u croupósus – croupous

N.B! The endings -eus, -eum are not diphthongs, therefore they should be read separately, e.g.: scaphoideus – scaphoid.

The pronunciation of consonants

There is a twofold way of pronunciation of some consonants depending on their position in the word. Usually these rules of pronunciation are similar to English ones but still, there is a reason to review them more precisely.

c	- before vowels e (ae, oe) and i, y, e.g.: <i>cérebro</i> – cerebrum, <i>medicína</i> – medicine, <i>caécus</i> –
C	blind, <i>coéna</i> – meal, <i>cytus</i> – cell;
k	- in other cases, e.g.: <i>cór</i> – heart, <i>cútis</i> – skin, <i>occipítalis</i> – occipital;
G, g	- is similar to English consonant g, e.g.: <i>glándula</i> – gland, <i>grávis</i> – heavy;
H, h	- is similar to English consonant h, e.g.: <i>húmerus</i> – humerus, <i>hómo</i> – human;
K, k	- is used only in borrowings, e.g.: <i>skéleton</i> (Greek) – skeleton, <i>Kálium</i> (Arabic) – Potassium, <i>keratítis</i> (Greek) – inflammation of cornea, <i>kefír</i> (Arabic) – kefir;
L, l -	- is always a palatalized sound, unlike the English one, e.g.: <i>lóngus</i> – long;
s	e.g.: <i>sánus</i> – healthy, <i>cósta</i> – rib;
S	- between two vowels, e.g.: <i>nasális</i> – nasal, and also between vowels and consonants m, n:
z	<i>ménsis</i> – month;
V, v	- like English consonant v, e.g.: <i>vértebra</i> – vertebra, <i>víta</i> – life;
kz	- between two vowels, e.g.: <i>exémplar</i> – example, <i>pléxus</i> – plexus;
X	- in other cases, e.g.: <i>léx</i> – law, <i>fórnix</i> – fornix;
ks	
z	- is used in borrowings of Greek origin, e.g.: <i>horizontális</i> – horizontal, <i>zóna</i> – belt, <i>zygóma</i> –
Z	zygomatic bone;
	- in borrowings, e.g.: <i>Zíncum</i> – zinc (German), <i>influéntza</i> – flu (Italian);
c	
W, w -	- in borrowings, e.g.: <i>unguéntum Wilkinsóni</i> – Wilkinson’s ointment, <i>syndrónum Wilsoni</i> – Wilson’s syndrome.

The combinations of letters ngu, qu, su, ti

ngu -	before vowels is pronounced as ngv, e.g.: <i>sánguis</i> – blood, <i>unguéntum</i> – ointment. before consonants is pronounced as ngu, e.g.: <i>ángulus</i> – angle, <i>línghula</i> – tongue.
qu -	is pronounced as kv, e.g.: <i>áqua</i> – water, <i>antíquus</i> – ancient.
su -	before vowels in the same syllable is pronounced as sv, e.g.: <i>suávis</i> – pleasant, <i>consuetúdo</i> – habit.
ti -	before vowels is pronounced as ci, e.g.: <i>injéctio</i> – injection, <i>operátio</i> – operation. - before consonants is pronounced as ti, e.g.: <i>tíbia</i> – tibia.

Medical and pharmaceutical terms of non-Latin origin are pronounced due to the rules of their original language, e.g.: French: *dragée* – dragee; *cháncre* – chancre; English: *shunt* – shunt, *bypass*; German: *Spátel* – spatula, spreader; *Stamm* – strain, etc.

The pronunciation of letter combinations ch, ph, th, rh, sch.

Combinations of these letters are only used in words of Greek origin. They are pronounced exactly as in English.

ch - ch: *chorda* – chord, string; *concha* – concha

rh - r: rhaps - raphe, seam, suture; rheumatismus - rheumatism

th - t: thorax - thorax; urethra - urethra

ph - f: pharynx - pharynx; periphéricus - peripheral

The capital letter is usually used:

- at the beginning of a sentence;
- for proper names, names of months;
- with names of chemical elements, plants and animals.

2 The accent. Length and brevity of the syllable.

The Latin word has as many syllables, as vowels. The syllables are to be counted from the end of a word (from the right to the left), e. g.:

me-di-cī-na

4 3 2 1

Only the second or third syllable can be stressed. The Latin language, unlike the English one, has long and short vowels. The place of stress depends on the length or brevity of the second syllable: if the second syllable is long, the stress remains on the second syllable; if it is short, the stress moves to the third syllable.

The length or brevity of a vowel depends on its position or on its nature. Diphthongs are always long by their nature, e.g.:

gangraena – mortification, gangrene,

pharmaceuta – pharmacist,

The length or brevity of a vowel is indicated in a dictionary: the length is denoted with a dash (¯) above the vowel, the brevity is marked with a tick (ˇ), e. g.: ā, ă, ē, ě.

The syllable is long, if:

The vowel is followed by two or more consonants, e.g.: *malīgnus* – malignant, *maxīlla* – the upper jaw.

The vowel is followed by x, z, e.g.: *reflēxus* – reflex, *Orýza* – rice.

The syllable is short, if:

The vowel is followed by one more vowel, e.g.: *línĕa* – line, *cránĭum* – skull, *fácĭes* – surface.

The vowel is followed by letter h, e.g.: *éxtrāho* – extract.

The length and brevity of some suffixes which are frequently used in medical terminology

The following syllables are always long:

-ā-	costālis	costal
-ār-	ulnāris	ulnar
-āt-	digitātus	digitate
-īn-	palatīnus	palatine
-ōs-	squamōsus	squamous
-ūr-	fissūra	fissure
-ūt-	dilūtus	diluted

The following syllables are always short:

-bĭl-	sanabĭlis	curable
-ĭc-	lymphatĭcus	lymphatic
-ōl-	malleōlus	malleolus
-ŭl-	ventricŭlus	ventricle

The place of a stress depends on the length or brevity of a syllable. Borrowings of Greek origin are stressed according to the rules of the Greek language, therefore some of these words do not fall under the aforementioned rules, e.g.: *cryotherapía* – cryotherapy, *pharmacía* – pharmacy; but: *hystológia* – histology.

3 Review of Latin Nouns. Declensions. Formation of anatomical terms (Sn-Sg). Introduction to the anatomical nomenclature The structure of anatomical terms

Anatomical nomenclature (Nomina anatomica) is a scientifically unified register of anatomical terms used in medicine and biology, which is formed accordingly to the body systems. The creation and development of anatomical nomenclature is linked with formation and evolution of anatomy. Anatomical terms were created during centuries on the ground of Greek and Latin languages. The modern anatomical nomenclature consists mainly of Latin words, but Greek terms are also used among them.

In the late nineteenth century some 50,000 terms for various body parts were in use. The same structures were described by different names, depending (among other things) on the anatomist's school and national tradition. Vernacular translations of Latin and Greek, as well as various eponymous terms, were barriers to effective international communication. There was disagreement and confusion among anatomists regarding anatomical terminology.

The First Anatomical nomenclature was adopted at the Congress of Anatomical Society (Basel, 1895) and was called Baseler Nomina Anatomica (BNA). With the development of morphology, anatomical terminology was improved and expanded, and the new register of terms was proposed by German Anatomical Society (Jena, 1935). The new register Jenaer Nomina Anatomica (JNA) was only used in Europe. In 1950, the 5th International Anatomical Conference renewed the existing register of Anatomical terms to make them shorter and easier to memorize.

The renewed and optimized register of terms was presented at the 6th International Anatomical Conference (Paris, 1955). The new register was named Parisiana Nomina Anatomica (PNA). This version of Anatomical nomenclature was widely used, but at consequent International Anatomical Conferences several changes were added (Montreal, 1987; Budapest, 1988; New York, 1989).

The new International register of anatomical terms was compiled In 1989 by the Federal Committee on Anatomical Terminology (FCAT). In 1997 the new universal register of anatomical terms was accepted and approved.

All the terms according to their structure are divided into monomial, binomial and polynomial.

1. Monomial:

simple – expressed by one word, e.g.: ulna, ae f – elbow bone, humerus, i m – humeral bone, cuneus, i m – wedge, caput, itis n – head, tuber, ěris n – tuber, facies, ěi f – surface;

composed – formed by two (or more) stems using linking vowels -o or -i , e.g.: humer-o-ulnaris – humeroulnar, cune-o-naviculāris – cuneonavicular, cune-i-formis – cuneiform, scaph-o-ideus – scaphoid.

2. Binomial:

terms are composed of a noun and a modifier, which concretizes the noun. Modifier always follows the noun, e.g.: cornu coccygeum (S_nA_n) – coccygeal horn, os coccygis (S_nS_g) – coccygeal bone.

The Noun (Nomen substantivum). Review of Latin nouns

All Latin nouns are divided into three genders – male, female and neutral. The category of gender in Latin is more definite than in English. The gender is included into the dictionary form of a noun and should be memorized. The gender of a noun is unchangeable.

Male – genus masculinum,

female – genus femininum,

neutral – genus neutrum,

Latin nouns, unlike English ones, are declined by cases and numbers.

There are two numbers in Latin – singular – *numerus singularis*, plural – *numerus pluralis*. And there are five cases (*casus*):

Nominatīvus (N.)

Genitīvus (G.)

Datīvus (D.)

Accusatīvus (Acc.)

Ablatīvus (Abl.)

The dictionary form of Latin nouns

All Latin nouns are divided into five types or declensions. The dictionary form of a noun consists of:

the nominative form

the ending of the Genitive case

the gender

e.g.: *vertebra*, ae f – vertebra; *angulus*, i m – angle; *septum*, i n – wall; *canālis*, is m – channel, canal; *processus*, us m – process; *facies*, ēi f – surface.

The Gen. sing. defines the declension of a noun, the Nom. sing. defines its gender.

Declensions include the following genders:

I – feminine

II – masculine, neutral

III – masculine, feminine, neutral

IV – masculine, neutral

V – feminine

Declensions of a noun:

Case	Declension				
	I	II	III	IV	V
Nom. sing.	-a (f)	-us, -er (m) -um (n)	different endings all genders (m, f, n)	-us (m) -u (n)	-es (f)
Gen. sing	-ae	-i	-is	-us	-ei

Gen. sing. defines the declension and the stem of a noun, e.g.:

Examples on nouns

The modifier expressed by a noun in the Genitive case (sing. or pl.) is a non-agreed modifier. A modifier always follows a noun. A non-agreed modifier is translated into English with the preposition “of”, e.g.: *spina scapulae* – spine of scapula, *os coccygis* – coccygeal bone, *arteria cerebri* – artery of cerebrum, cerebral artery. The scheme of such terms is – S_n S_g.

4 Review of Latin Adjectives. Two groups. Formation of anatomical terms (Sn-An). The grammatical categories of the adjective

All adjectives are divided into two groups. The adjectives of the 1st and the 2nd declension belong to the first group, and the adjectives of the 3rd declension belong to the second one. Each group of the adjectives is declined according to the corresponding declension of nouns. Adjectives have the same endings as nouns.

Masculine – -us, -er

Feminine – -a

Neutral – -um

In a dictionary all adjectives are given in their dictionary form, which consists of a complete form of the masculine gender and endings of feminine and neutral genders, e.g.: longus, a, um; dexter, tra, trum.

Adjectives of the feminine gender are declined according to the 1st declension, adjectives of masculine and neutral genders – according to the 2nd one. The adjective (modifier) always follows a noun and agrees with it in gender, number and case.

The scheme of an agreed modifier is as follows:

S_nA_n (S – Substantivum, n – Nominativus,

A – Adjectivum n – Nominativus)

Adjectives of the 1st and 2nd declension:

with the endings -us, -a, -um :

bifidus, a, um – bifid

caninus, a, um – canine

cavernosus, a, um – cavernous

cavus, a, um – cave

clavatus, a, um – clavate

deciduus, a, um – deciduous

durus, a, um – hard

enameleus, a, um – enamel

hyoideus, a, um – hyoid

hypoglossus,

15 The second group of adjectives (adjectives of the 3rd declension)

All the adjectives of the 3rd declension are divided into three groups:

1. Adjectives with three endings:

Male (masculinum) – -er

Female (femininum) – -is

Neutral (neutrum) – -e

These adjectives are rarely used.

2. Adjectives with two endings:

Male (masculinum) – -is

Female (femininum) – -is

Neutral (neutrum) – -e

According to the 3rd declination of adjectives one declines:

Participle Present Active (Participium praesentis activi). This form is similar to the one-ending adjectives, e.g.: recens, ntis – fresh:

affērens, ntis – afferent

permānens, ntis – permanent

incipiens, ntis – incipient

Similarly to adjectives, participle follows the noun and agrees with it:

vas affērens – afferent vessel

dens permānens – permanent tooth

Adjectives in the comparative degree, e.g.:

m, f n

anterior, anterior – anterior

ductus inferior – inferior duct

posterior, posterior – posterior

linea inferior – inferior line

superior, superior – superior

labium inferius – inferior lip

inferior, inferius – inferior

Adjectives major (m, f), majus (n) – big and minor (m, f), minus (n) – small in the anatomical terminology are translated in the positive or comparative degree, e.g.:

ductus sublinguālis major – major sublingual duct

forāmen palatīnum majus – greater palatine foramen

ductus sublinguālis minor – minor (lesser) sublingual duct

The adjectives of the 3rd declension:

- with two endings:

brevis, e – short

buccālis, e – buccal

cervicālis, e – cervical

craniālis, e – cranial

dentālis, e – dental

faciālis, e – facial

frontālis, e – frontal

gingivālis, e – gingival

labiālis, e – labial

- with one ending:

duplex, ĩcis – double

par, paris – equal

simplex, ĩcis – simple

teres, ětis – round

5 Anatomical terms with different kind of modifiers. Test.

In anatomical and histological terminology the non-agreed modifier usually follows the agreed modifier ($S_n A_n S_g$):

facies costālis scapūlae – costal surface of scapula

tunīca fibrōsa bulbi – fibrous tunic of eyeball.

But there are some exceptions ($S_n S_g A_n$):

cavitas oris propria – proper oral cavity

lamīna dentis mediālis – middle layer of a tooth.

In clinical and pharmaceutical terms the agreed modifier usually follows the non-agreed one ($S_n S_g A_n$):

diverticūlum vesīcae urinariae congenitum – congenital diverticula of urinary bladder

extractum Frangulae fluidum – fluid extraction of Black Elder.

Generally, if the noun has more than one modifier, the most important modifier will be put in the first place:

systema nervōsum periphericum – peripheral nervous system.

Adjectives with the meaning “space” (left, right), “direction” (anterior, posterior), “colour” (red, yellow), “size” (big, small), “form” (round, square) usually are the last. Each Latin term, unlike English, starts with a noun.

$S_n A_n A_n$:

arteria pulmonālis dextra – left pulmonary artery,

processus articulāris superior – superior articular process.

$S_n S_g A_n$:

medulla ossium (Gen. pl.) flava – yellow bone marrow,

apertūra pelvis inferior – inferior aperture of the minor pelvis.

Latin prepositions are divided into two groups. The first group is used with Accusativus while the second one – with Ablativus. Some of them are used both with Accusativus and Ablativus, depending on the meaning.

Prepositions in – “in” and sub – “under” are used with either Accusativus or Ablativus.

1) Tabuleta in aqua solvitur. (Abl.) The tablet is dissolved in water.

2) Pone tabulettam in aquam. (Acc.) Put the tablet into water.

1) Pone tabulettam sub linguam. (Acc.) Put the tablet under the tongue.

2) Tabuleta sub lingua est. (Abl.) The tablet is under the tongue.

Nouns causa – cause and gratia – grace are used with Genitive as prepositions with the meaning “for”: amicitiae gratia – for friendship, pecuniae causa – for money.

7 The 2nd declension of Nouns. Masculine and neutral genders.

Masculine and neutral nouns with the ending -i in Gen. sing. belong to the 2nd declension. In Nom. sing. masculine nouns have endings -us, -er, neutral nouns end in -um, e.g.:

musculus, i m – muscle

cancer, cri m – cancer

paediater, tri m – paediatrician

ligamentum, i n – ligament

Exceptions

feminine gender:

diameter, tri f – diameter

crystallus, i f – crystal

8 The Adjectives of the 1st and 2nd declension.

Adjectives of the 1st and 2nd declensions belong to the 1st group of adjectives. Masculine and neutral adjectives are declined according to the rules of the 2nd declension, and feminine adjectives are declined according to the 1st one. These adjectives have the same endings as nouns of corresponding declensions.

m f n

long-us long-a long-um (longus, a, um) – long

aeg-er aegr-a aegr-um (aeger, gra, grum) – sick

lat-us lat-a lat-um (latus, a, um) – wide

nig-er nigr-a nigr-um (niger, gra, grum) – black

lib-er libĕr-a libĕr-um (liber, ěra, ěrum) – free

The adjective agrees with the noun in gender, case and number.

intestĭnum, i n – intestine

caecum, i n (typhlon, G.) – caecum

rectum, i n (proctos, G.) – rectum

duodĕnum, i n – duodenum

ileum, i n – ileum

jejūnum, i n – jejunum

colon, i n – colon

N.B.! Besides, some terms are still used with the noun:

intestĭnum crassum – large intestine

intestĭnum tenue – small intestine

Sometimes the compound adjectives are used in the anatomical terminology:

tibiocalcaneus, a, um – tibiocalcaneal

petrotympanicus, a, um – petrotympanic

tympanosquamosus, a, um – tympanosquamous

37 The Participle Passive (Participium perfecti passīvi)

The Participle Passive is widely used in anatomical nomenclature. Its grammatical form is similar to the adjectives of the 1st and 2nd declension, e. g.: affixus, a, um, circumflexus, a, um.

Similar to the adjectives passive participle agrees with the noun in gender, case and number, e.g.: ligamentum transversum – transverse ligament.

9 The 3rd declension of Nouns. General information. Three types of Nouns

All nouns of the 3rd declension are divided into three groups: consonant type, vowel type and mixed.

The consonant group

The consonant group is the basic one that includes nouns of different genders with different number of syllables in Nom. and Gen. sing. and with only one consonant at the end of a stem: os, oris n – mouth; apex, ĭcis m – apex; cartilāgo, ĭnis f – cartilage.

The vowel group comprises only neutral nouns with the endings -e, -al, -ar, in Nom. sing, in Gen. sing. -is, -ālis, -āris, e.g.: rete, is, n – net, calcar, āris n – spur, animal, ālis n – animal.

Difference in declination: Abl. sing. -i

Nom. pl. -ia

Gen. pl. -ium

The mixed group

The mixed group contains nouns with equal number of syllables in Nom. and Gen. sing.: auris, is f – ear, cutis, is f – skin. Nouns with two or more syllables at the end of a stem belong to this type as well: dens, dentis m – tooth; os, ossis n – bone; pars, partis f – part.

Difference in declination:

Abl. sing. -e

Nom. pl. (n) -a

Gen. pl. -ium

Examples of declination:

10 The 3rd declension of Nouns. Masculine gender. Exeptions.

Exceptions of the gender

Feminine:

-er gaster, tris f – stomach

mater, tris f – mother, layer

Neutral:

-or cor, cordis n – heart

-os os, ossis n – bone

os, oris n – mouth

-er tuber, ěris n – tuber

The most commonly used expressions:

gaster sana – healthy stomach

quies absolūta – absolute quiet

lex dura – harsh law

cor humānum – human heart

os leporīnum (labium leporīnum) – cleft lip

lege artis – according to all the rules

lex non scripta – un written law

Dr. med.= Doctor medicinae – Doctor of medicine

11 The feminine nouns of the 3rd declension

The feminine nouns of the 3rd declension have the following endings:

Nom. sing.	Gen. sing.	Examples
-as	-ātis	extremītas, ātis f – extremity
-es	-is	pubes, is f – pubes
(with equal number of syllables in Nom. and Gen.)		
-is	-is	
	-īdis	auris, is f – ear
-us	-ūdis	glottis, īdis f – glottis
-s		incus, ūdis f – incus
(with a previous consonant)		
-x	-cis	frons, frontis f – forehead
(except-ex)		
	-gis	radix, īcis f – root
-do	-īnis	calx, cis f – heel
-go	-īnis	phalanx, āngis f – phalanx
-io	-ōnis	longitūdo, īnis f – length
		cartilāgo, īnis f – cartilage
		secretio, ōnis f – secretion

9 Exceptions

Masculine gender:

-as	vas, vasis n	– vessel
	pancreas, ātis n	– pancreas

Neutral gender:

Memorize the following terms:

sanguis venōsus – venous blood

dens serotīnus – serotinous tooth

tendo (Achillis) calcaneus – calcaneal tendon

margo interosseus – interosseous margin

vas sanguineum – blood vessel

12 The neutral nouns of the 3rd declension

Exceptions

Masculine gender:

aden, ĉnis m – gland

splen, enis m – spleen

ren, renis m – kidney

pecten, ĩnis m – pecten

13 The peculiarities of the 3rd declension nouns

The noun *vas, vasis* n – vessel is declined according to the 3rd declension in singular and according to the 2nd declension in Dat. and Abl. pl., instead of *-ībus*.

s i n g. p l.

Nom. *prisma prismāt-a*

Gen. *prismāt-is prismāt-um*

Dat. *prismāt-i prismāt-is*

Acc. *prisma prismāt-a*

Abl. *prismāt-e prismāt-is*

The Greek nouns

The Greek and Latin nouns of feminine gender with the ending *-sis* (*basis, is f, diaphŷsis, is f*) have the following peculiarities:

Acc. sing. *-im*

Abl. sing. *-i*

Gen. pl. *-ium*

s i n g. p l.

Nom. *bas-is* *bas-es*

Gen. *bas-is* *bas-ium*

Dat. *bas-i* *bas-ībus*

Acc. *bas-im* *bas-es*

Abl. *bas-i* *bas-ībus*

14 The adjectives of the 3rd declension. The Participle Present Active

Adjectives of the 3rd declension are declined according to the vowel group of the 3rd declension. They have the following endings: Abl. sing. *-i*; Nom. and Acc. pl. *-ia* (n), Gen. pl. *-ium*.

Examples of declination

sing.

Nom. *acer, acris, acre brevis* (m, f) *breve* (n) *simplex* (m, f, n)

Gen. *acris brevis* *simplīcis*

Dat. *acri* *brevi* *simplīci*

Acc. *acrem* (m, f) *brevem* (m, f) *simplīcem* (m, f)

acre (n) *breve* (n) *simplex* (n)

Abl. *acri brevi simplīci*

pl.

Nom. *acres* (m, f) *acria* (n) *breves* (m, f) *brevia* (n) *simplīces* (m, f)
simplicia (n)

Gen. *acrium* *brevium* *simplīcium*

Dat. *acrībus* *brevībus* *simplīcībus*

Acc. *acres* (m, f) *acria* (n) *breves* (m, f) *brevia* (n) *simplīces* (m, f)

genu, us n – knee

Exception:

manus, us f – hand

The 4th and 5th declination nouns used in anatomical nomenclature

The most commonly used phrases:

in situ – in the original place, appropriate position, or natural arrangement

in statu nascendi – in the process of creation

in statu quo – in the previous status

status commūnis – common status

status locālis – local status

in die – every day

per diem – during the day

The 2nd semester

1 Introduction to the clinical terminology

The modern scientific terminology, and particularly, its medical subdivision, reflects centuries-old history of medicine. Medical scientific subsystem appears to be the most unified one. This phenomenon can be accounted for the tradition to use unexhaustible sources of classical languages: both ancient Greek and Latin in the process of term formation.

It is estimated that about three-fourths of our medical terminology is of Greek origin. The first reason for this is that the Greeks were the founders of rational medicine in the golden age of Greek civilization in the 5th century B.C. A second reason for the large number of Greek medical terms is that the Greek language lends itself easily to the building of compounds. When new terms were needed, with the rapid expansion of medical science during the last century, Greek words or Latin words with Greek endings were used to express the new ideas, conditions, or instruments. The new words follow the older models so closely that it is fairly difficult to distinguish the two by their forms. Such recent words as appendicitis, creatinine, cystoscope, epinephrine, streptococcus, and many others do not appear different from the classical terms. The fact is that about one-half of our medical terminology is less than a century old. A third reason for using the classical roots is that they form an international language, easily understood by anyone familiar with the subject matter.

Greek medicine migrated to Rome at an early age, and many Latin terms crept into its terminology. Latin was the language of science up to the beginning of the 18th century, so practically all medical terms were written in Latin. Due to the influence of the great anatomical work of Andreas Vesalius, *De humani corporis fabrica* (1543), the terminology of anatomy is almost exclusively Latin.

The Greek terms came into the English language through Latin. In adapting the Greek words the Romans used the Latin alphabet. Among the most frequently used elements in the formation of terms are prefixes. They consist of one or more syllables (originally prepositions or adverbs) placed before the words to show various kinds of relationships. In joining the stem, the final letter of the prefix undergoes certain changes. If a prefix ends in a vowel and a stem begins with one, the final vowel of the prefix is usually dropped, e.g., epi-encephalon becomes ep-encephalon; para-otid becomes par-otid. The final n of a prefix becomes l before following l, as in syl-logism from syn-logism. It becomes m before b, m, p, ph, as in em-phasis from en-phasis. In addition, it is to be noted that the final consonant of the Latin prefixes ad-, con- and ob- are usually changed to duplicate the letter which follows, for example: ad-cept becomes ac-cept; con-lapse becomes col-lapse; ob-ciput becomes oc-ciput.

A suffix is a terminal letter or syllable added to the stem to modify or amplify its meaning. If a suffix begins with a consonant and it is joined to a stem ending in a consonant, a connecting vowel, mostly o, is added to make the junction.

In addition to the words made up of a stem combined with one or more prefixes and suffixes, there are terms which have a second stem as a component part. Some Greek terms may have as many as three stems joined, e.g., leucocyt-hemia – leucemia. Nouns, adjectives, and adverbs may be used in various combinations. The first part of a compound word generally indicates its essential meaning which is modified or amplified by the second part. If the second part begins with a consonant, the connecting vowel o is usually inserted for the sake of euphony, e.g., hepato-melanos. If two vowels are juxtaposed by the combination, the first is generally dropped, e.g., enter-ectomy.

Latin is, comparatively speaking, poor in compound words. Instead of doubling up words in Latin, significant prefixes or suffixes are added, or the words-retaining their proper syntactical relations-are simply written together as

one word (jurisdictio, oaterfamilias, etc.). Still, the language contains many genuine compounds of all parts of speech: nouns, verbs and adverbs, e.g., ilio-costal – relating to the ilium and ribs (costa); dextro-manual – right-handed; funi-form – rope-like.

Many medical terms are a mixture of Greek and Latin. Such terms are called hybrid terms. They may be Greek words with Latin endings, such as bacteri-al; dermat-al; peri-card-ium; or Latin words with Greek endings, as appendic-itis; tonsill-itis; fibr-oma; granul-oma, etc.; or a mixture of Greek and Latin in one compound, such as cancer-ology; colorimeter; mono-nuclear; venotomy and many others.

2 The Greek and Latin doublets of nouns (masculine gender, II declension)

Latin noun	Greek noun	Greek word-forming element	Meaning
calcūlus, i m	líthos	lith-	calculus
cancer, cri m	carcínos	carcin-	cancer
digītus, i m	dáctylos	dactyl-	finger
locus, i m	tópos	top-	place, site
medícus, i m	iatrós, iatér	iatr-	physician, doctor
morbus, i m	nosós	nos-	disease, ailment, illness
muscūlus, i m	mys, myós	my-	muscle
nasus, i m	rhis, rhinós	rhin-	nose
nervus, i m	néuron	neur-	nerve
oculūs, i m	ophthalmós	ophthalm-	eye
pīlus, i m	thrix, trichós	trich-	hair
somnus, i m	hýpnos	hypn-	dream, sleep
succus, i m	chylós	chyl-	juice
umbīlicus, i m	omphalós	omphal-	umbilicus navel
utērus, i m	hystéra métra	hyster- metr-	uterus
vir, viri, i m	anér, andrós	andr-	man, male

The Greek and Latin doublets (neuter gender, II declension)

The endings as word-forming elements (II declension)

3 The Greek and Latin doublets of adjectives (I-II conjunctions)

Latin adjective	Greek adjective	Greek word-forming element	Meaning
acīdus, a, um	oxýs	oxy-, ox-	acid, sour
albus, a, um	leucós	leuc-, leuk-	white
aliēnus, a, um	xénos	xen-	alien
caecus, a, um	typhlós	typhl-	blind
crassus, a, um	pachýs	pachy-	fat, thick
flavus, a, um	xanthós	xanth-	yellow
durus, a, um	sclerós	scler-	hard, solid
humīdus, a, um	hygrós	hygr-	humid, moist
latus, a, um	platýs	platy-	Wide
magnus, a, um	macrós mégas, megále	macr- mega- megal-	Large
malus, a, um	cacós	cac-	Bad
medius, a, um	mésos	mes-	middle
mortuus, a, um	necrós	necr-	dead
multus, a, um	polýs	poly-	numerous
niger, gra, grum	mélas, mélanos	melan-	black
novus, a, um	néos	neo-	new
parvus, a, um	micrós, olígos	micr- olig-	small, little
rectus, a, um	orthós- proctós-	orth- proct-	straight
ruber, bra, brum	erythrós-	erythr-	red
siccus, a, um	xerós-	xer-	dry
spurius, a, um	pseudés	pseud-	non-genuine, false or spurious
tardus, a, um	bradýs	brady-	slow

4 The Greek and Latin doublets of nouns (masculine gender, III declension)

5 The Greek and Latin noun doublets (feminine gender, III declension)

Memorize the III declension nouns

adipositas, ātis f	obesity
rubor, ōris m	reddening
functio, ōnis f	function
herpes, ētis m	herpes
livor, ōris m	bruise
pavor, ōris m	fear, phobia

stupor, ōris m	stupor
tremor, ōris m	tremor
graviditas, ātis f	pregnancy
amputatio, ōnis f	amputation
extractio, ōnis f	extraction
inflammatio, ōnis f	inflammation
curatio, ōnis f	treatment
sanatio, ōnis f	sanation
exacerbatio, ōnis f	exacerbation
complicatio, ōnis f	complication
resectio, ōnis f	resection
transfusio, ōnis f	transfusion

6 The Greek and Latin doublets (neuter gender, III declension)

Latin noun	Greek noun	Greek word-forming element	Meaning
abdomen, ĩnis n	lapára	lapar-	abdomen
cadaver, ěris n	necrós	necr-	corpse, cadaver
caput, ĩtis n	cephalé	cephal-	head
cor, cordis n	cardía	cardio-	heart
corpus, ōris n	sóma, somatos	somat-	body
fel, fellis n	chóle	chol-	gall, bile
lac, lactis n	gála, gá lactos	galact-	milk
lien, liēnis m	splen	splen-	spleen
os, oris n	stómat	stomat-	mouth, oral cavity
os, ossis n	osteon	oste-	bone
pus, puris n	pýon	py-	pus
ren, renis m	nephρός	nephr-	kidney
semen, ĩnis n	spérmat	spermat-	semen
sol, solis m	hélios	heli-	sun
tempus, ōris n	chrónos	chron-	time
viscus, ěris n	splánchnon	splanchn-	time
pectus, ōris n	stéthos	steth-	internal organ

The word-forming elements of the III declension with the ending -sis

Combining forms (suffix)	Meaning
-emĕsis	vomiting

-genēsis	origin, formation
-gnōsis	knowledge
-lŷsis	separation, loosening, dissolving, destruction
-mycōsis	fungus disease
-necrōsis	death of tissue
-poēsis	formation, production
-ptosis	dropping, downward displacement
-praxis	execution
-rrhexis	rupture
-schīsis	fissure, splitting
-sclerōsis	hardening
-stāsis	suppression, stoppage
-stenōsis	narrowing, constriction
-lithiāsis	calculus formation

The lexical minimum of the III declension nouns

glaucōma, ātis n	glaucoma
coma, ātis n	coma
oedēma, ātis n	(o)edema
symptōma, ātis n	symptom
ulcus, ěris n	ulcer
vulnus, ěris n	wound

7 The Greek and Latin doublets of the III declension adjectives

Latin adjective	Greek adjective	Greek word-forming element	Meaning
aequālis, e	hómoeos homós	homoeo- homo-	same, unchanging
brevis, e	brachýs	brachy-	short
celer, ěris, ěre	tachýs	tachy-	rapid
dulcis, e	glykýs	glyc- glyk-,gluc-	sweet
impar, is	ánisos	aniso-	unequal, dissimilar
mollis, e	malakós	malac-	soft
omnis, e	pas, pantós	pan-, pant-	all, any
par, paris	ísos	iso-	equal, similar
puter, tris, tre	saprós	sapr-	rotten, putrid
senex, senis	géron,	ger-,	old,

	gérontos	geront-	senile
virīdis, e	chlorós	chlor-	green

The lexical minimum of the III declension adjectives

The lexical minimum of the Participle Present Active

alternans, ntis	increasing
agītans, ntis	trembling
diffērens, ntis	different
intermittens, ntis	intermittent
deformans, ntis	deforming
domīnans, ntis	dominant
incipiens, ntis	initial
migrans, ntis	migratory
penetrans, ntis	penetrating
perforans, ntis	perforative
persistens, ntis	persistent
progrediens, ntis	progressing
recipiens, ntis	recipient
recurrens, ntis	recurrent
serpens, ntis	creeping, serpentine
tremens, ntis	trembling

In word-building of clinical terms, suffixes are classified due to their functions into:

- suffixes, forming terms with new meanings. They are mainly added to the stems of Greek nouns; however, sometimes they may be added to the Latin nouns as well, e.g., tonsillitis – inflammation of tonsils, fibrōma – benign tumour of the connective tissue;
- suffixes, forming clinical terms with a new connotation in meaning.

8 The Greek and Latin doublets of the IV declension

Latin noun	Greek noun	Greek word-forming element	Meaning
appetītus, us, m	órexis	orex-	appetite
audītus, us, m	ácusis	acu-, acus-	hearing
foetus, us, m	émbyon	embry-	embryo, fetus
gustus, us, m	géusis	geus-	taste
manus, us, f	cheir	chir-	arm, hand
motus, us, m	kínesis	kines-	movement

olfactus, us m	osmé	osm-	olfaction
partus, us m	tócos	toco-	labour, delivery
pulsus, us m	sphygmós	sphygm-	pulse
sensus, us m	aésthesis	aesthes-	sensation, sense
textus, us m	histós	hist-	tissue
visus, us m	ópsis	ops-	vision, sight
vomītus, us m	émetos	emet-	vomiting
cornu, us n	kéras, kératos	kerat-	cornea, corneous membrane
gelu, us n	crýos	cry-	cold, ice, frost
genu, us n	goný	gon-	knee

The Greek and Latin doublets of the V declension nouns

The lexical minimum of the IV declension nouns

abortus, us m	abortion
abscessus, us, m	abscess
collapsus, us m	collapse
complexus, us m	complex
cursus, us m	course
habitus, us m	appearance
decubitus, us m	bedsore, decubitus
exitus, us m	end
gradus, us m	grade
infarctus, us m	infarction
insultus, us m	stroke
prolapsus, us m	prolapse
reflexus, us m	reflex
refluxus, us m	reflux (flow in reverse direction)
singultus, us m	hiccup, hiccup, singultus
situs, us m	position
status, us m	condition

9 Word-building by means of Latin and Greek prefixes

Learning and understanding of the medical terminology requires the profound knowledge of etymology and meaning of the most commonly used Greek and Latin word-forming elements (combining forms, prefixes, suffixes). They make terms concrete and accurate, define their content.

Medical terms may be formed:

- by adding prefixes and suffixes;
- by combining two or more stems (roots).

Prefixes are placed in front of a word in order to add the shade of meaning or to change it insignificantly. Prefixes have developed from prepositions and adverbs. They develop the specific meaning of the appropriate preposition. Besides the primary meaning, prefixes possess literal, direct and figurative meanings, e.g., Greek prefix para- indicates a capsule or

cellular tissue that surrounds an organ, e.g., paratonsillitis means inflammation of a tonsil, but it may have a figurative meaning as well “disturbance, fluctuation from the norm”, e.g., parageusia implies distortion of the sense of taste.

Components formed from numerals are also regarded as prefixes. Latin prefixes, unlike the Greek ones, predominate in anatomical terminology. In clinical terminology prefixes of Greek origin are found more frequently.

The last consonant assimilates to the initial root consonant. Some Latin prefixes have exactly the same meaning as the Greek ones.

Word-building by means of Latin prefixes

Word-building by means of Greek prefixes

The adverbs serving as prefixes

Word-building by means of Latin and Greek numerals

The translation of diagnoses names

Diagnosis is the identification of diseases by the examination of symptoms, signs, and case history (anamnesis) and by other investigations. The term “diagnosis” is of Greek origin (Greek *diagnōsis*, meaning distinguishing). It denotes the medical conclusion as to the health condition of a sick person, his/her present illness (trauma) or the cause of death.

Diagnostic nomenclature is an open subsystem of the clinical terminology with numerous functional peculiarities which are stipulated, first of all, by two types of term-formation. In diagnosis name formation, the components commonly used in clinical terminology combine with agreed and non-agreed attributes, which is typical for anatomical terminology. The overwhelming majority of diagnoses names are formed by combining clinical and anatomical terms. The peculiarities of their orthography and orthoepy are based on the rules of the Latin language and borrowings from the ancient Greek.

While translating the diagnostic nomenclature into English a particular attention must be paid to the phonetic variety of some clinical terms (cephalia – brachycephaly and brachycephalism) and the orthographic variation (neuro- – neuropathy and neurocytoma). Nevertheless it is inadmissible to misinterpret the terms.

10 The verb

Latin verbs possess the following properties:

1. Tense (Tempus) – there are six tenses in Latin. We shall study only the Present tense (Praesens).

2. Number (Numerus):

numerus singularis – singular;

numerus pluralis – plural.

3. Person (Persona):

persōna prima – the 1st person;

persōna secunda – the 2nd person;

persōna tertia – the 3rd person.

4. Mood (Modus):

modus indicatīvus – the Indicative Mood;

modus conjunctivus – the Subjunctive Mood;

modus imperativus – the Imperative Mood;

infinitivus – the Infinitive.

5. Voice (Genus):

genus actvum – the Active Voice;

genus passivum – the Passive Voice.

The dictionary verb forms

Latin verbs are given in a dictionary in four main forms. We shall study only two main forms, namely:

1. the 1st person singular of the Present Indicative Active (praesens indicatvi actvi) with the personal ending -o;
2. the indefinite verb form (infinitivus praesentis actvi) with the ending -re;

curo, āre – to cure

misceo, ěre – to mix

solvo, ěre – to dissolve

linio, ĩre – to lubricate

The identification of the verb conjugation

Latin verbs are divided into four conjugations (conjugation – conjugatio).

Verbs with the stem ending -ā are referred to the I conjugation. Verbs with the stem ending -ē belong to the II conjugation. Verbs with the stem ending in a consonant and in a vowel -ŭ belong to the III conjugation. Verbs with the ending -ī are referred to the IV conjugation.

The stem of the Present tense (praesens) is determined by means of cutting the suffix -re in the indefinite verb form for the verbs of the I, II, IV conjugations and the suffix -ěre for the III conjugation:

Conjugation	Infinitivus	Praesens stem	Praesens stem ending
I	curāre	curā -	ā
II	miscĕre	miscĕ-	ē
III	solvĕre diluĕre	solv- dilu-	consonant - ŭ
IV	linīre	linī-	-ī

The Imperative Mood (Modus Imperativus)

The Imperative Present is used in the 2nd person (singular and plural). The Imperative Mood for the verbs of the I, II, IV conjugations in the 2nd person singular coincides with the verb stem of the Present tense. The Imperative Mood for the verbs of the III conjugation in the 2nd person singular is formed by adding the ending -e to the verb stem. The 2nd person plural of the Imperative Mood of the I, II, IV conjugations is formed adding the ending -te to the stem in the Present tense. In the III conjugation the combining vowel -ī is added between the stem and the ending.

Conjugation	Infinitivus	Praesens stem	Imperativus	
			2 nd person singular	2 nd person plural
I	curāre	curā-	Cura! Cure!	Curāte! Cure!
II	miscēre	miscē-	Misce! Mix!	Miscēte! Mix!
III	solvēre diluēre	solv- dilu-	Solve! Dissolve! Dilute!	Solvīte! Dissolve! Diluīte!
IV	linīre	linī-	Lini! Lubricate!	Linīte! Lubricate!

Negation in the indefinite verb form for the 2nd person singular is expressed by the word *noli* + infinitivus: *Noli nocēre!*

For the 2nd person plural: *nolīte* + infinitivus: *Nolīte nocēre!*

In prescriptions verbs are used in the Imperative Mood:

Recīpe: Take:

Sterilīsa! Sterilize!

Misce! Mix!

Da. Dispense!

Da tales doses numēro... – Dispense the following doses...

Signa. – Sign. (Denote).

The Present Indicative Active and Passive (Praesens indicatīvi actīvi et passīvi)

Latin verbs can be used in two voices: active and passive. Transitive verbs can be used both in the Active and Passive Voices. Intransitive verbs can only be used in the Active Voice. Transitive verbs require using the Accusative case (Acc.). The Present Indicative is formed by adding the ending of the Active and Passive Voices to the stem of the Present tense.

Personal endings of the Present Indicative

Person	Active Voice		Passive Voice	
	sing.	plur.	sing.	plur.
1.	-o	-mus	-or	-mur
2.	-s	-tis	-ris	-mini
3.	-t	-nt	-tur	-ntur

In the I, II, IV conjugations personal endings are added directly to the verb stems, but in the verbs belonging to the IV conjugation in the 3rd person plural the combining vowel –u is added between a stem and a personal ending: *lini-u-nt*, *lini-u-ntur*.

In the III conjugation the personal ending is added to a stem by means of the combining vowel –ī (in the 2nd person singular praesens indicatīvi passīvi by means of –ē). In the 3rd person plural the combining vowel –u is added.

NB! As a rule, personal pronouns in Latin are not used with the verbs.

	I	II	III	IV
Main verb forms	curo, āre	misceo, ēre	solvo, ěre diluo, ěre	linio, ĩre
Verb stem	curā-	miscē-	solv- dilū-	linī-

The Present Indicative Active and Passive

11 The Subjunctive Mood (Modus conjunctivus)

Unlike the Imperative Mood (imperatīvus), denoting a direct order, and the Indicative Mood (indicatīvus), denoting real actions, the Subjunctive Mood (conjunctivus) represents actions that are possible, doubtful, supposed or desired.

The Present Subjunctive is formed by means of replacing the stem ending –a with –e in the verbs of the I conjugation. In the verbs belonging to the II, III, IV conjugations the Present Subjunctive is formed by adding the vowel –a and personal endings to the verb stems.

Personal endings of the Subjunctive Mood

The Present Subjunctive Active (Praesens conjunctivi actīvi)

The Present Subjunctive Passive (Praesens conjunctivi passīvi)

The 3rd person singular and plural praesens conjunctivi passivi can be translated in the pharmaceutical terminology as the indefinite verb form, meaning an order, e.g.,

Misceātur. – Mix.

Detur. – Dispense.

Signētur. – Sign. (Denote).

Besides the Imperative Mood, one can use in prescriptions the verb forms of the Subjunctive Mood, meaning virtually the same:

Misceātur. Dētur. Signētur. – Let be mixed! Let be dispensed! Let be denoted! (Mix! Dispense! Denote!)

Dentur tales doses numēro... – Let the following doses be dispensed! (Dispense such doses!)

Repetātur! – Let be repeated! Repeat!

Sterilisētur! – Let be sterilized! Sterilize!

The verb sum, esse – to be

The Present Indicative (Praesens indicatīvi)

Singularis	Pluralis
1. sum – I am	sumus – we are
2. es – You are	estis – you are
3. est – he, she, it is	sunt – they are

The verb esse possesses functions of:

simple predicate;

link-verb.

As a simple predicate the verb esse means “to exist, to be”.

For example:

In clinica oculistae sunt. – There are oculists at the hospital.

The nominative part of the compound predicate is used in the Nominative case:

Medicina disciplina antiqua est. – Medicine is an ancient science.

The lexical minimum of the verbs

The verb *fi*, *fiēri* – to form, to become

The verb *fi*, *fiēri* belongs to the irregular verbs. It possesses the ending of the Active Voice with the passive meaning.

The verb *fi*, *fiēri* is conjugated according to the IV conjugation. In prescriptions it is used in the Subjunctive Mood (the 3rd person singular and plural).

Present Indicative (indicativi)		Present Subjunctive (conjunctivi)	
sing.	pl.	sing.	pl.
fit	fiunt	fiat	fiant

Memorize prescription expressions:

Misce, fiat pasta. Mix to form a paste.

Misce, fiat unguentum. Mix to make an ointment.

Misce, fiat linimentum. Mix to form a liniment.

Misce, fiat emulsum. Mix to form an emulsion.

Misce, fiat pulvis. Mix to form a powder.

Misce, fiant pilulae. Mix to form pills.

Misce, fiant species. Mix to form species.

Professional medical expressions:

Non licet. – is not permitted.

Quod licet Iovi, non licet bovi. – What is allowed to Jupiter, is not allowed to the ox).

Primum non nocere, or noli nocere. – First, not to harm.

Respice finem. – Look to the end.

12 The Latin chemical nomenclature

Chemical nomenclature is the system of naming chemical elements (e.g., zinc, sulfur) and compounds (e.g., acids, oxides, salts) which serve as medical substances. In prescriptions one denotes Latin names instead of chemical element symbols or instead of compound formulas.

The names of chemical elements

The names of chemical elements are II declination nouns of the neuter gender (Nom. sing. ending –um), e.g., Argentum, i n – silver, Bromum, i n – bromine, Ferrum i n – iron, Iodum i n – iodine, Zincum, i n – zinc.

Exceptions: Phosphorus, i m – phosphorus, Sulfur, ūris n – sulphur.

The names of acids

Latin names of acids comprise the noun *acĭdum*, *i n* and an adjective. Acids (*acida*) are classified as oxygen-containing and oxygen-free. The names of oxygen-containing acids are formed by adding the suffix *-ĭcum*, denoting the oxidation degree, to a stem of the acid-forming element. For instance:

Acĭdum sulfurĭcum (H_2SO_4) – sulphuric acid;

Acĭdum nitrĭcum (HNO_3) – nitric acid.

The suffix *-ōsum* indicates a lower degree of oxidation. For example:

Acĭdum sulfurōsum (H_2SO_3) – sulphurous acid;

Acĭdum nitrōsum (HNO_2) – nitrous acid.

If there are more than two oxidation degrees, each of them is expressed by corresponding prefixes and suffixes. For example:

Acĭdum per-chlor-ĭcum ($HClO_4$) – perchloric acid;

Acĭdum hypo-chlor-ōsum ($HClO$) – hypochlorous acid.

The names of oxygen-free acids are formed by means of the prefix *hydro-* and the suffix *-icum*. For example:

Acĭdum hydro-chlor-ĭcum (HCl) – hydrochloric acid

Acĭdum hydro-sulfur-ĭcum (H_2S) – hydrosulphuric acid

The most essential acid names

I

Acĭdum acetĭcum – acetic acid

Acĭdum acetylsalicylicum – acetylsalicylic acid

Acĭdum ascorbĭcum – ascorbic acid

Acĭdum benzoĭcum – benzoic acid

III

Acĭdum hydrochlorĭcum – hydrochloric acid

The names of oxides

Oxides (''oxide'' is derived from the Greek ''oxys'' – acid, sour) comprise: oxides, peroxides, hydroxides, suboxides:

oxide – *oxŷdum*, *i n*

peroxide – *peroxŷdum*, *i n*

hydroxide – *hydroxŷdum*, *i n*

suboxide – *oxydulātus*, *a, um* (adjective)

Names of oxides, peroxides, hydroxides contain two nouns:

– cation name (always comes first in Gen. sing);

– anion name (follows the cation name in Nom. sing.), e.g., *Calcii oxŷdum* – calcium oxide, *Hydrogenii peroxŷdum* – hydrogen peroxide, *Calcii hydroxŷdum* – calcium hydroxide.

Suboxide is expressed by the adjective *oxydulātus*, *a, um*, which agrees with the name of the cation, e.g., *Nitrogenium oxydulātum* – nitrogen suboxide.

The names of salts

Salts are classified as oxygen-containing and oxygen-free. The salt name contains a cation name (the most commonly, metal) in Gen. sing., and an anion name (acid residue) in Nom. sing.

The anion name of oxygen-containing acid salts with the highest oxidation degree is expressed by a noun of the 3rd declension, which in Nom. sing. ends in -as, and in Gen. sing. has the ending -atis, e.g.:

Natrii sulfas (Nom. sing.) – sodium sulphate;

Natrii sulfātis (Gen. sing.) – sodium sulphate;

Codeini phosphas (Nom. sing.) – codeine phosphate;

Codeini phosphātis (Gen. sing.) – codeine phosphate.

The anion name of oxygen-containing acid salts with a lower oxidation degree is expressed by a noun of the 3rd declension, which in Nom. sing. has the ending -is, and in Gen. Sing. ends in -itis, e.g.:

A numeral, indicating the number of hydrogen atoms, and the root -hydrogen are added in the names of salts formed by acids with three and more hydrogen atoms, e.g., Natrii Hydrogenphosphas (monohydrogenphosphas) – sodium hydrophosphate – Na_2HPO_4 or Natrii dihydrogenphosphas – sodium dihydrophosphate – NaH_2PO_4 .

The names of basic salts are formed from middle salts names by adding the prefix sub- to the anion base, e.g., Bismuthi subnitrās – bismuth basic nitrate.

If there are more hydroxyl groups in the basic salt, a numeral, indicating the number of these groups, is added to the salt name, e.g.: Bismuthi (III) dihydroxonitrās (Bi(OH)NO₃) – bismuth dihydroxonitrate (III).

The names of potassium and sodium organic salts

Latin names of sodium and potassium organic salts comprise two nouns in the Nominative case: the base name and the hyphen-attached word natrium or kalium (the way of writing potassium and sodium with a small letter is the exception to the rule concerning the capitalization of chemical elements names). Initially the anion name is written in a capital letter, followed by the cation name written in a small letter, e.g.: Norsulfazolūm-natriūm – sodium norsulphazole, Gen. sing. Norsulfazolī-natrii.

The names of hydrocarbon and acid radicals

Names of hydrocarbon and acid radicals are formed by adding the suffix -yl (from the Greek word "hyle" – substance) and the ending -ium to the hydrocarbon or acid roots, e.g.:

acetyl – acetylium

ethyl – aethylium

methyl – methylium

The names of ethers

Latin names of ethers comprise two words, like the names of salts, e.g.: Methylii salicylās – methylsalicylate, Amylii nitris – amylnitrite.

13 Prescriptions. The pharmaceutical terminology

Pharmaceutical terms are predominantly formed by elements of Greek origin, which indicate medicine chemical composition, origin, therapeutic effect, etc.

Pharmaceutical terms are mainly coined by adding several components (roots), by means of the combining vowel -o. For instance, *Acidum hydrochloricum* – hydrochloric acid (chemical composition is revealed), *Chinocidum* – (the origin is indicated: quinine is produced from a quinquina bark), *Chologonum* – chologon, bile-expelling medication (therapeutic effect is indicated).

Components of complex terms possessing clearly established stable meanings and forming several group terms are known as word-forming elements.

The names of hydrocarbon and acid radicals

The word-forming elements indicating pharmacological groups of medicines

The word-forming elements indicating pharmacological effects of medicinal forms

The group names of medicines according to their pharmacological effects

The word order in pharmaceutical terms

In pharmaceutical terms there is the following word order:

a noun is followed by an adjective, e.g.: *Helichrysum arenarium* – *Helichrysum arenarium*

an attribute, indicating a substance or a herb, is expressed by a noun in Genitive singularis, e.g.: *oleum Anisi* – Anise oil

names of stone seeds are written in Genitive pluralis, e.g.: *Oleum Persicorum* – Peach oil

commercial names are written in Nominative with a capital letter in converted case, e.g.: *Tabuletae "Citramonum"*

in compound pharmaceutical terms, a medicinal form comes first followed by names of medicinal substances or herbs, then the attribute comes, accordingly, e.g.: *Infusum Sennae compositum* – Senna complex infusion

The herb names in Crude Drug Nomenclature

Herb names used in Pharmacopoeia, pharmacology and prescribing, i.e. in medicinal nomenclature, commonly differ from herb names from the botanical nomenclature.

In the botanical nomenclature, according to the principles of a Swiss scientist K.Linney, every herb possesses two names:

- 1) generic (expressed by a noun);
- 2) specific (most commonly expressed by an adjective, rarely by a noun);

In the botanical terminology the generic name is commonly written with a capital letter and the species name with a small one.

In the pharmaceutical terminology herbs typically possess either a generic or a specific name. For example:

However, pharmaceutical herb names may consist of several (mainly two) words like in Botany. For example:

Sometimes, names of herbs used in Pharmacy differ from botanical herb names. For example:

Botanical name	Pharmaceutical names
<i>Cassia angustifolia</i>	Senna
<i>Cinchōna succirubra</i>	China

Memorize the names of herb parts

14 Prescriptions. Grammatical Structure. Liquid forms.

Memorize the following words:

pro (Abl.)	for, instead, adv.
probe	right(ly), correctly, accurately, well, adv.
proprius, a, um	own, proper, adj.
quartus, a, um	the fourth, num.ord.
quintus, a, um	the fifth, num.ord.
quod	what
heroīcus, a, um	drastic, potent, adj.
inscriptio, ōnis f	inscription, n
invocatio, ōnis f	address, appeal, n
locus, i m	place, spot, locality, site, n
materia, ae f	substance, stuff, material, matter, n
medicamentum, i n	medications, medicines, drugs, n
noto, āre	denote, mark, register, v
occūpo, āre	occupy, v
octāvus, a, um	the eighth, num.ord.
odor, ōris m	smell, odour, scent, n
pharmacopoea, ae f	pharmacopoeia, dispensatory, n
post (Acc.)	afterwards, after, subsequently, adv.
postrēmus, a, um	last, past, adj.
primus, a, um	the first, num.ord.

Drug prescribing is a part of medical science which deals with the rules of prescribing various forms of medications.

Prescription (from Latin "recipio, recēpi, receptum, ěre" – to take, i.e. "receptum" – taken, received, obtained) is the physician's written instructions for a pharmacist concerning compounding and dispensing medications with mentioning the route of their administration. Prescription is composed of superscription, inscription, subscription and signature.

Rx (invocatio, or superscription) is the symbol for prescriptions and generally understood to be a contraction of the Latin verb "Recīpe", meaning "take thou".

Inscription (Inscriptio or the body of prescription) is the main part of the prescription containing the names and quantities of the prescribed drugs.

Designatio materiārum – the constituents of medicine forms, their dosage. Drug constituents are classified into the following types according to their purpose:

- a) basis seu remedium cardināle – the main substance intended for the primary therapeutic effect;
- b) remedium adjuvans – an auxiliary substance, which enhances the effect of the main substance and alleviates its side effects;
- c) remedium corrīgens – a correcting substance (improves taste, odour or, sometimes, colour of medications);
- d) remedium constituens – a forming substance, which gives solid, soft or liquid form to medications;

Subscription (Subscriptio – "what is written below") contains prescription directions to the pharmacist: the way of compounding of the medicine, a medicinal form, a number of doses, a packing type. Sometimes the physician uses only the following words: Misce. Da (in a detailed prescription) or Da. (in a shortened prescription);

Signature (Signatūra, signa, or sig) implies directions to be placed on a prescription label to indicate to the patient how to take or use the medication. This part of the prescription begins with the word Signa – sign or denote. The route and the time of medication administration are given in a state language or in a language clear for a patient. Abbreviations are not admissible in this part of the prescription.

Nomen et sigillum medici personāle – a physician's signature and a personal seal.

The rules on writing prescriptions

One writes the name of a medicinal substance with an initial capital letter in the Genitive case (which is grammatically correlated with the quantity of a substance) following the verb Recīpe. Each new substance in a complex prescription is written from a new line with an initial capital letter.

With an initial capital letter in the middle of the line one writes:

names of medicinal substances;

names of chemical elements;

names of plants and animals;

personal names.

The quantity of solid and powdery substances is indicated in grams and parts of a gram (e.g., 1,0; 10,0; 100,0; 0,5; 0,01; 0,002). The quantity of liquid substances is indicated in millilitres or grams (e.g., 1 ml, 10 ml, 200 ml) or in drops. Liquid medicinal substances up to 1 ml are usually dosed in drops. A number of drops is marked in Roman figures. The word "gutta" in a prescription is written in the Accusative case: guttam I, guttas X (e.g., gtt.I, gtt. X). Antibiotics and some other medicines are dosed and dispensed in effect units (UE), serums and vaccines – in antitoxic units (AU) and in international units (IU).

The number of constituents is denoted on the right in a prescription line. Abbreviations are admissible in prescriptions, provided they meet generally accepted medical and pharmaceutical regulations (details about using abbreviations see further). If two or more substances are prescribed in equal amounts, their amount is only expressed once, after the last name. Figures are preceded by the adverb "ana" (āā – equally).

For instance:

If a patient requires an urgent medicine administration (in emergency), a physician writes the following: Cito! (quickly), Citissime! (as quickly as possible) or Statim! (immediately) at the top part of the prescription.

It is admissible to write out up to three medicines, providing they do not contain potent or narcotic medicines. Prescriptions are separated by means of a horizontal line.

Prescriptions that do not meet regulations are considered invalid, therefore, medicines cannot be dispensed due to them. These prescriptions are left in a pharmacy, stamped as "invalid prescription", recorded in a special register, with further return to the clinical setting, which issued the prescription.

Additional expressions used in prescriptions

Cito! Quickly!

Statim! Immediately!

Repēte! Repeat!

Repetātur! Repeat.

Repēte bis! Repeat twice!
Bis repetātur! Repeat twice!
Repēte ter! Repeat three times! Thrice!
Ter repetātur! Repeat three times.
Non repetātur! Do not repeat!
Pro me! For me!
seu Pro auctōre! For the author!
Ad usum proprium For own application.
Verte! Turn over!

The abbreviations in prescriptions

There are various abbreviations in prescriptions. Typically, one writes out in an abbreviated form the following:
names of medicine forms;
names of organs and parts of plants;
certain instructions to a pharmacist, prescription definitions.

It is inadmissible to shorten denotations of similar ingredients, since it may cause ambiguity.

If a word is shortened in a syllable containing two or more consonants, all these consonants are preserved. For example:
extractum – extr.

compositum – comp.

Generally accepted prescription abbreviations commonly form an initial group of letters, or rarely, an initial letter of the word or words. For instance:

In capsūlis gelatinōsis – in caps.gel.

Da tales doses numēro... – D.t.d.N.

The most important prescription abbreviations

Da.

Signa. For infiltration anaesthesia.

Infusions – Infūsa (infūsum, i n)

Infusion is the soaking of a solid substance in a solvent, such as water, for the purpose of extracting an active ingredient.

Infusions are aqueous extractions from the medicinal plant material by means of boiling and subsequent infusing powdered leaves, flowers, herbs or dissolving extracts. Infusions are prepared ex tempore.

In prescriptions for infusions and decoctions, the word “Recīpe” is followed by the word “Infūsi”; by a total amount of medicinal plant material, and a general amount of the infusion.

Recīpe: Infūsi foliōrum Sennae ex 10,0 : 150ml

Da

Signa. Take 1 tablespoonful in the morning and at bedtime.

Recīpe: Infūsi foliōrum Uvae ursi 200 ml

Da.

Signa. Take 1 tablespoonful in the morning and at bedtime.

The following officinal infusions are available at the chemist's:

Infusum Valeriānae (Valeriane infusion),

Infusum Sennae compositum (Complex senna infusion).

Extracts are concentrated preparations from animal or vegetable drugs obtained by removal of the active constituents with a suitable solvent or solvent mixture, evaporation of all or nearly all the solvent, and the adjustment of the residual mass or powder to prescribed standards. Due to the consistency extracts are classified as: liquid (fluida), dense (spissa) and dry (sicca). Dense and dry extracts are prescribed and dispensed in powders, tablets and other medicinal forms. Liquid extracts are concentrated preparations of plant crude. All liquid extracts are officinal. They are prescribed, dosed and administered in the same ways as tinctures.

Due to the extracting liquid one distinguishes:

Extracta aquōsa – aqueous extracts;

Extracta spīrituōsa – alcohol extracts;

Extracta oleōsa – oily extracts;

Extracta aetherea – ether extracts.

Emulsions – Emulsa (emulsum, i n)

Emulsions are heterogenous, liquid or semisolid dosage forms containing at least two immiscible liquids or semisolids, one of which is dispersed as small globules throughout the other, usually with the aid of a surfactant. Emulsions can be classified as: emulsa oleōsa – oily emulsions (non-genuine) and emulsa seminalia or emulsa seminum (seed genuine emulsions).

Emulsions can be administered externally, internally and parentherally.

Emulsions are prescribed both in complete and abbreviated forms:

Recīpe: Olei Ricīni 15 ml

Gelatōsae 7,5 ml

Aquae purificātae ad 150 ml

Misce, fiat emulsum.

Da.

Signa. Should be taken with tablespoonfuls within 30 minutes. Recīpe: Emulsi olei Ricīni 150 ml Da.

Signa. Should be taken with tablespoonfuls within 30 minutes.

Recīpe: Emulsi olei Ricīni ex 15,0-150 ml

Da.

Signa. Should be taken by tablespoonfuls within 30 minutes.

Mucilages – Mucilagīnes (mucilago, īnis f)

Mucilages are viscous adhesive preparations made by dissolving or suspending exudates from certain trees and shrubs in water (tragacanth mucilage). Mucilages may also be prepared from hydrated synthetic polymers (methylcellulose mucilage). Mucilages are obtained by means of aqueous processing mucous substances of plant origin. Flax seed contains mucous substances.

Mucilages are intended for oral administration, and sometimes for external use.

They serve as *remedium corrigens*, when irritating substances for mixtures and oenemas are prescribed:

15 Soft medicinal forms

Soft medicinal forms comprise:

Gels *gela* (*gelum*, i n)

Ointments *unguenta* (*unguentum*, i n)

Pastes *pastae* (*pasta*, ae f)

Liniments *linimenta* (*linimentum*, i n)

Plasters *emplastra* (*emplastrum*, i n)

Gels – *gela* (*gelum*, i n)

Gels are soft medicinal forms for topical administration. Gels contain one or more substances and auxiliary substances, forming the base.

Gels are applied to skin, wounds, ulcers, and some mucous membranes.

Due to the base, gels are subdivided into: hydrophobic (oleogel, hydrophobic solvent – vaseline, vaseline oil, paraffin, gel-forming substance, etc); hydrophilic (hydrogel – water, hydrophilic or non-watery solvent and hydrophilic gel-forming substance).

According to the route of administration gels are subdivided into: 1) gels for external use; 2) gels for oral administration (the most commonly used in paediatric practice); 3) nasal gels; 4) ophthalmic gels; 5) otic (auricular) gels; 6) rectal gels; 7) vaginal gels; 8) cervical gels; 9) urethral gels; 10) dental gels (for gum application, etc).

(*Lycopodium*).

Pastes are only prescribed in a complete form, with mentioning all constituents, their amounts, and the order to the pharmacist: “*Misce, fiat pasta*” (*M.*, f. *pasta*). If the ointment content is included in *Pharmacopoeia*, the paste is prescribed in an abbreviated form:

Form-building substances used in liniment production are plant and mineral oils – *oleum Lini* (linseed or flaxseed oil), *oleum Hyoscyami* (*Hyoscyamus* oil), *oleum Olivarum* (olive oil), *oleum Amygdalarum* (Almond oil), *oleum Helianthi* (Sunflower oil), *oleum Persicorum* (Peach-kernel or Peach oil), *oleum Vaselini* (Vaseline oil), *oleum Ricini* (Ricin oil), *Pix liquida* (tar), *Ichthyolum* (ichthyol or ichthammol) and others. Liniments are prescribed in a full form:

Official liniments:

Linimentum Aloes - Aloe liniment

Linimentum balsamicum Vishnevsky - Vishnevsky Balsamic Liniment

Linimentum “Sanitas” - liniment “Sanitas”

Linimentum Streptocidi 5% - Streptocide liniment

Linimentum “Alorom” - liniment “Alorom”

Linimentum “Capsici camphoratum” - pepper-camphoric liniment

Plasters – *Emplastra* (*emplastrum*, i n)

Plasters are paste-like mixtures which can be spread over the skin and which are adhesive at body temperature. Plasters may be protectant, counterirritant. Besides medicinal plants, plasters contain resins, caoutchouc or (India rubber), fats, waxes, salts of fatty acids, vaseline, paraffin, which after melting easily mix with medicinal plants.

Prescriptions for plasters are only written out in an abbreviated form:

- the quantity of the preparation is indicated in grams, and therefore, the medicinal naming is written in Gen. sing.;
- sizes of the material onto which the plaster is spread is indicated; and the name of the medicinal form is written in Acc. sing.

Due to the adhesion degree plasters are subdivided into: solid (*emplasta dura*) and liquid (*emplastra fluida*).

16 The solid medicinal forms

Read and translate:

1. Pulvĕres in partes aequāles dividāntur.
2. Genĕra amyĕlorum quattuor sunt: amyĕlum Solāni, amyĕlum Tritici, amyĕlum Maĕdis, amyĕlum Oryzae.
3. Carbo activātus formā tabulettārum etiam “Carbolĕnum” nominātur.
4. Species sedatīvae e rhizomāte cum radicibus Valeriānae, foliis Menthae piperītae et Trifolii fibrīni, strobĭlis Humūli lupūli constant.
5. Capsūlae gelatinōsae elastīcae, durae et operculātae sunt.

Solid medicinal forms comprise:

Powders *pulveres* (*pulvis*, *ĕris m*)

Capsules *capsulae* (*capsūla*, *ae f*)

Tablets *tabulettae* (*tabuletta*, *ae f*)

Dragee *dragee* (*dragee*, *n* is not declined)

Suppositories *suppositoria* (*suppositorium*, *i n*)

Herbal blends *species* (*species*, *erum f (pl)*)

Powders – Pulvĕres (*pulvis*, *ĕris m*)

Powders are solid medicinal forms containing dry, powdery, and finely divided substances, intended for internal and external administration.

Due to the route of administration there are powders for internal application (*ad usum internum*) and for external administration (*ad usum externum*). According to the degree of powdering there are the finest-grained (*subtilissĭmi*), fine-grained (*subtĭles*) and coarse-grained (*grossi*) powders. The finest powders are typically designed for internal administration. Fine powders are commonly used for internal administration.

Due to the quantity of substances powders are subdivided into simple (*pulvĕres simplĭces*), comprising one substance, and compound (*pulvĕres composĭti*), comprising more than two substances.

Powders, divided into separate doses, are termed as divided or dosed (*pulvĕres divĭsi*). They are commonly used for internal administration. Non-divided or non-dosed (*pulvĕres indivĭsi*) powders, prescribed from 5 to 100,0 and more, are dosed by patients themselves under physician’s instructions. They are commonly intended for external administration. In prescribing simple powders the word *Recĭpe* is followed by: the substance name in the Genitive case, and the substance quantity, without mentioning the name of medicinal form:

e). Typically, capsules are administered orally. Capsules also come in a vaginal or rectal form. In prescriptions for capsules, one should indicate the type of capsules:

Abbreviated prescription:

Some complex officinal suppositories possess commercial names, e.g., “Anusolum”, “Bethiolum”, “Viburcolum”, “Osarbonum”, “Candibene”. In prescriptions, medicinal form names are written in the Accusative case, plural, followed by the suppository name and its number. If the suppository name is written in converted comas, it should be used in the Nominative case, singular. If the name is without converted comas, it is written in Genitive case, singular.

Herbal blends – Species, ērum f (pl)

Herbal blend is a medicinal form consisting of coarse herb powder (flowers, leaves, roots). Herbal blends are available for internal use as infusions or decoctions: (ad infūsa seu decocta), species fumāles (herbal blends for smoking), herbal blends for gargling (ad gargarismāta), mixtures for cataplasms (ad cataplasimāta) or for baths (pro balneis). In prescriptions for this medicinal form both the route of administration and the mode of medicine preparation are denoted.

Herbal blends can be dosed and non-dosed. Dosed mixtures are prescribed commonly if plant raw material contains potent substances. Each constituent with indicated amount is given in a prescription, followed by “Misce, fiant species” and by the amount of doses and signature.

species ad gargarismāta herbal blend for gargling