STATE MEDICAL AND PHARMACEUTICAL
UNIVERSITY *NICOLAE TESTEMITSANU*

Nicolai SAVA, Sergiu MELNIC,
Corina SCUTAR, Vasile CAZACU

PRACTICAL PRESCRIBING

Cişinău
2004

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Chisinau
Polygraphic Editorial Centre *Medicina*
2004

CZU 615.015.3:615.1/.2(0758)

This issue has been approved by the Central Methodical Council of SUMP "Nicolae Testemitsanu" under no. 7 from 27.05.2003

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Descrierea CIP a Camerei Naționale a Cărții
Sava, Nicolai
Practical Prescribing / Nicolai Sava, Sergiu Melnic, Corina Scutar, Vasile Cazacu; State Medical and Pharmaceutical Univ. „Nicolae Testemițanu". – Ch.: Centrul Ed.-Poligr. „Medicina", 2004.– 106 p.
Bibliogr. p. 106 (18 tit.)
ISBN 9975–907–43–1
50 ex.

615.015.3:615.1/.2(0758)

ISBN 9975–907–43–1

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Preface

The aim of this manual is to acquaint the students of different medical universities with the rules of the dispersing of medicines and with the technology of the drug forms. In the manual you can find other information that is indispensable for the correct writing of a prescription: the introduction ways of the pharmaceuticals in the organism, their dosage and effects.

Good prescribing is not an easy discipline to master. By good prescribing, we mean prescribing of the appropriate drug, in the correct dosage of an appropriate formulation, at a correct length of time. This definition includes no prescribing of any drug at all if no prescription is called for. To achieve this, it requires detailed knowledge of the pathophysiology of the diseases you intend to treat and of the clinical pharmacology of the drugs you intend to use, and much more important is what you intend to prescribe as a future specialist. Drugs are prescribed because of their potential benefit to the patient, but in every case this is accompanied by the risk of adverse effects. Before prescribing, the potential benefits from the treatment should be weighed against the risks, because of you depends the human life.

Authors

1. INTRODUCTION

Drug evolution

The drug appeared at the same time with the human being, and the preparation of the multiple pharmaceutical forms used for the prophylaxis and cure of different pathologies is known still from the antiquity.

The drug has a long historical period and is divided into four compartments:

- Religious period
- Philosophical period
- Experimental period
- Scientific period

In the religious period the people had their medicines, that preponderantly were of vegetal, animal origin, but also of chemical and mineral origin; for example: clay, mud, salt, potassium etc.

At the same time with the appearance of the first civilizations appear the first works with "scientific" character. A part of the Egyptian pharmacopoeia is written on a papyrus, made approximately in the year 1550 b. Ch., that comprises circa 1000 prescriptions based on plants, animal organs, with indications concerning the pharmaceutical form and the preparation way. The Egyptians used powders, decoctions, infusions, eyewashes, ointments, watery solutions etc.

In the Middle Orient the oldest pharmacopoeia is considered the pharmacopoeia from SUMER, under the form of clay plates, found in NIPPUR and BABILON, dating since the end of the III millennium b. Ch., over 250 medicinal plants and over 150 drugs of animal origin in different pharmaceutical forms.

Another document is the code of HAMMURABI from the city of SIPPAR, which contains prescriptions with the indication of their preparation.

In China, during the I millennium appeared medicinal and pharmaceutical works, the most famous being the Chinese pharmacopoeia called PEN-TSAO, in which the elementary dates of the pharmaceutical act are presented: the choice and the harvesting of plants, their utilization, being also given a big number of medicines of animal and mineral origin.

The philosophic period begins since the 1000 b. Ch. till 900, being dominated by personalities of some Greek and Roman doctors.

Old Greeks lionized the medicine, APOLO the God of Sun and of the Medicine, and his son ASCLEPIOS were venerated in temples.

Gradually the Medicine is secularised and in the PERICLE's century (cent. V b. Ch.) Philosophers as PLATON, SOCRATE and ARISTOTEL were discussing the problem of the medicinal art in public squares.

The therapeutics of Antique Greece is dominated by the HYPOCRITE's personality, being considered "the father of Medicine".

The works of HYPOCRITE and of his students were totalled in a collection called *Corpus hippocraticum* that comprised nearly 300 medicines.

An especially important aspect represents the ethic and deontological preoccupations expressed in the "Oath of Hypocrite", from which comes out that the medicine and pharmacy were practiced by the same person.

The most famous doctor-pharmacist of Antiquity was CLAUDIUS GALENUS, who composed more than 500 medicine works, in which the classification of drugs and their composition has an important part. GALENUS is considered the "father of pharmacy" and the science that transforms the drugs into medicines was called "Galenic pharmacy".

In antique Rome the drugs were sold in drugstores and in laboratories were prepared such medicines as: oils and perfumes, ointments, cosmetics.

The III period of the pharmacy history is called experimental and lasts since Middle Ages till the XVII-th century.

The alchemists brought an important contribution to the development of pharmaceutical sciences. They invented the distillation apparatus and the distillation, isolating the ethylic alcohol, aldehydes.

The Arabians have set up the first public drugstore in 754 with specialists in drug preparing domain. In this period the most famous personalities in pharmaceutical domain were AVICENNA, COHEN EL ATTAR, MOISE MAIMONIDE.

In Europe the first drugstore was set up in Naples in 1140, in Paris – 1180, in Prague – 1278, in Basel – 1250, in Köln – 1240.

At the time of the appearance of the first drugstores, in the south part of France, a Law decreed in the city of Arles separates the profession of the doctor from the profession of a chemist. Frederic the II gave the jurisdiction act that established the legal basis of pharmacy in the Occidental Europe in 1240.

In the scientific period of the discoveries in natural sciences, medicine and pharmacy took vast proportions and were rapidly succeeded.

J.B. van HELMONT exposed his experience regarding the preparation and action of drugs, in his work: *Pharmacopolium Ac. Dispensatorium Modernum* (Pharmacy and the modern preparation of drugs) in 1648.

In 1691 appears the first edition of *World Pharmacopoeia* that was written by Nicolas Lemery; in 1675 was published the first chemistry Treatise, and in 1698: *Dictionnaire Universal des Drogues Simples.*

SAMUEL HAHNEMANN (1755 - 1843) introduces homeopathy as a therapeutic method, which also today is being disputed.

LOUIS PASTEUR (1822 - 1895) set up the basis of enzymology and bacteriology, creating the antirabic vac-

cine and founded the Institute that carries his name (1887), the French doctor Cl. Bernard elaborated the theory and practice of the experimental medicine.

In 1777 in Paris appears a college of pharmacy and in 1796 – Société libre des pharmaciens de Paris, forming the pharmacy school.

Pharmacopoeia

The pharmacopoeia (comes from the Greek – Hellenic words pharmacon – that means *drug* and poieo that means *make, prepare*) is a medico-pharmaceutical legislative code regarding remedies, preparations and utilized materials in the medicine with curative, prophylactic and diagnosis aim authorized by the department organs.

The pharmacopoeia appeared a long time ago. It is known that in Egypt still in the XVI century before Christ activated a Pharmacopoeia. But these books are only the prototype of modern Pharmacopoeias. The facts of their appearance are very contradictory: some consider that the Egyptian papyrus, written approximately in 1400 before Christ, is the prototype of the modern Pharmacopoeias, the others consider that the prototype is the Arabic Crabaddin (IX century, 840 year).

The pharmacopoeia constitutes a monographic collection in alphabetic order and establishes the standards necessary to the preparation and keeping of drugs.

It contains the description of the drug: its chemical formula, analytic reactions, physical constants, the main chemical properties necessary for their identification, but in the case of compound drugs or medicinal forms – the formula and the way of preparation. There are also described the control methods of the purity, qualitative and quantitative analyses of the active principles, their keeping in best conditions and their biological activity.

II. DISPENSING OF MEDICINES. PRESCRIPTION

The general pharmacography is an applicative branch of general pharmacology, scientific grounded on the general pharmacokinetics.

The general pharmacography studies the drug names, pharmaceutical form, medicinal prescription, settlements regarding the prescription and delivery of drugs, possology, the drug composition and their keeping etc.

The dispensing of medicines is the part of pharmacology that studies the prescribing methods of drugs. The prescription is a document through which the doctor is addressing in written form to the chemist to inform him about the drug recommended to his patient, its composition, the way of preparation and administration. The prescription constitutes a legal act of justification and accounting of a drug with special regime. The prescription must be written legible, without mistakes. According to the law number 195 from 01.07.2000 of Health Ministry of the Republic of Moldova there are three types of prescription formulation: N.1 – for the prescribing and delivery of drugs, N.2 – for the prescribing and delivery of intoxicants and psychotropic, N.3 – for the prescribing and delivery of drugs, the cost of which is compensated entirely or partly.

I. Prescription formulary No.1

For the prescribing and delivery of drugs
(sizes 100 mm × 200 mm)

Stamp of medico-sanitary institution	
Doctor _____	Tel. _____
PRESCRIPTION	
Date of prescribing "____" _____ 200_	
(first name and second name of the patient) Age _____ years	
Price	Rp.: Signature and stamp of the doctor _____
The prescription is valid 10 days, 2 months (specification)	

V E R S O

Of the prescription formulary no. 1

THE DOCTOR'S GUIDE

- it is obligatory to complete all dates stipulated in the formulary;
- the heading stamp of the medico-sanitary institution must be visible for the easy determination of the name and number of the institution. If the name of the medico-sanitary institution is printed then the heading stamp isn't applied;

- the name of the industrial drug, the content of the extemporal medicinal form (the names of ingredients), the addressing to the chemist about the medicinal form preparation and its delivery from the drugstore are prescribed in Rumanian or Latin, legibly, clearly with ink or pencil, the corrections are forbidden;
- on the formulary it is admitted the prescription of only one drug from the toxic, intoxicant, psychotropic groups;
- only the abbreviations specified in "General rules of drug prescribing" are admitted;
- the quantity of the liquid substances is prescribed in millilitres (Sol. of sodium bromide 3 % - 200 ml), in grams (glycerol - 10, 0) or in drops (Sol. of hydrochloride adrenaline 0, 1 % - gtts XX); of the solid substances – in grams (sodium bromide – 3,0) or units of international action (benzyl penicillin sodium 1000000 UI);
- the administration way is prescribed in Rumanian or in the language spoken by the patient; there are not admitted general indications such as "Intern", "Known" etc.;
- the doctor's signature is confirmed by his personal stamp;
- the specification of the prescription validity term is made through the uselessness barring;

Date	Received	Prepared	Tested	Liberated

II. Prescription formulary no. 2

For prescribing and delivery of intoxicants and psychotropic

(sizes 100 mm × 150 mm)

Document of strict evidence

Stamp of medico-sanitary unit

Doctor _____ Tel. _____

PRESCRIPTION

Series _____ no. _____

Date of prescribing "____" _____ 200_

(first name and second name of the patient)

Age _____ years Medical card no. _____

Price	Rp.:
	Signature and stamp of the doctor _____ Signature of the assistant doctor _____

The prescription is valid 7 days

VERSO

Of the prescription formulary no. 2

THE DOCTOR'S GUIDE

- it is obligatory to complete all data stipulated in the formulary;
- the heading stamp of the medico-sanitary institution must be visible for the easy determination of the name and number of the institution. If the name of the medico-sanitary institution is printed then the heading stamp isn't applied;
- the series presents the abbreviation of the city (county) where the medical unit is situated and is typographical applied; the number of prescription contains six signs;
- the name of the industrial drug, the content of the extemporal medicinal form (the names of ingredients), the addressing to the chemist about the medicinal form preparation and its delivery from the drugstore are prescribed in Rumanian or Latin, legibly, clearly in ink or pencil, the corrections are forbidden;
- on the formulary it is admitted the prescription of only one drug;
- only the abbreviations specified in "General rules of drug prescription" are admitted;
- the quantity of the liquid substances is prescribed in millilitres, grams or drops; of the solid substances – in grams or units of international action;
- the administration way is prescribed in Rumanian or in the language spoken by the patient; there are not admitted general indications such as "Intern", "Known" etc.;
- the doctor's signature is confirmed by his personal stamp;
- the signature of the assistant doctor is obligatory;
- the prescription is obligatory proclaimed with a round stamp of the medico-sanitary unit;
- the prescription formularies are in quantitative evidence;

Date	Received	Prepared	Tested	Liberated

This formulary serves for prescribing intoxicant substances according to special standards that can be prescribed to incurable patients.

PARTICULARITIES OF THE INTOXICANTS AND PSYCHOTROPIC PRESCRIBING

1. The intoxicant and psychotropic drugs, being under international control on the territory of the Republic of Moldova according to the International Convention and approved by the Ministry of Health through the order No. 405 from December 22, 1998, are prescribed on a special prescription formulary.
2. By prescribing it will be mentioned "General rules of the drugs prescribing". The doctor, indicating the number of the medical card of the patient, directly prescribes the prescription.
   Such a prescription is signed by the assistant doctor and is obligatory proclaimed with the stamp of the medico-sanitary unit.
   Only one drug can be prescribed on the prescription No.2.
3. The intoxicant and psychotropic drugs, being under international control on the territory of the Republic of Moldova according to the International Convention and approved by the Ministry of Health through the order No. 405 from December 22, 1998, are prescribed on the prescription formulary No. 1 and are supplementary proclaimed with the stamp "For prescriptions".
4. It is forbidden the prescribing and delivery of drugs from the following table in quantities that will outrun the norms established as maximum on a single prescription:

No.	Name of drug	Maximum norm of prescribing and delivery on a prescription
1.	Sodium etaminal	1, 0 gr.
2.	Hydrochloric ethylmorphine	0, 2 gr.

3.	Codeine (phosphate codeine)	0, 2 gr.
4.	Hydrochloric ephedrine	0, 6 gr.
5.	Codterpin (tablets)	12 tablets
6.	Hydrochloric morphine, morphilong	0, 1 gr.
7.	Omnopon	0, 1 gr.
8.	Pentosacine	0, 3 gr.
9.	Promedol	0, 25 gr.

5. For other drugs it is admitted the prescribing and delivery in quantities for a seven days cure term.
6. For persons with oncological diseases it is admitted the prescribing and delivery of intoxicant drugs indicated in the point 4 in double quantities and for other drugs – in necessary quantities for a 14 days cure term.
7. The term of validity of the prescriptions containing intoxicant and psychotropic drugs prescribed on the prescription formulary No. 2 is 7 days, of that prescribed on the prescription formulary No. 1 – 10 days.

III. Prescription formulary no. 3

For the prescribing and delivery of drugs, the cost of which is compensated entirely or partly
(sizes 100 mm × 200 mm)

Stamp of medico-sanitary unit	(1)
Doctor _____ Tel. _____	(2)

PRESCRIPTION

Series _____ no. _____

Date of prescribing "____" _____ 200_

1. Free of charge	2. Reduced price 50 %

PATIENT	_____ (first name and second name of the patient) Age _____ years Medical card no. _____ Address _____	(3)

Price	Rp.: Signature and stamp of the doctor _____

The prescription is valid 7 days, 10 days, 2 months
(specification)

VERSO

Of the prescription formulary no. 3

THE DOCTOR'S GUIDE

- it is obligatory to complete all data stipulated in the formulary;
- the heading stamp of the medico-sanitary institution must be visible for the easy determination of the name and number of the institution. If the name of the medico-sanitary institution is printed then the heading stamp isn't applied;
- the series presents the abbreviation of the city (county) where the medical unit is situated and is typographical applied; the number of prescription contains six signs;
- the doctor's code (2) is applied only in case of automatic analysis of prescription;
- the free prescription is specified by encircling number 1 and barring number 2 and of inscription "with reduced price 50%"; the prescription with reduced price of 50 % is specified by encircling number 2 and barring number 1 and the inscription "free";
- the group code (3) presents the order number of categories of persons and sick men that benefit on gratuitous and advantageous conditions by the drug securing; the group code is specified by the doctor that prescribe the prescription;
- the prescription date of the prescription, name, age, medical card no., patient's address and doctor's name are obligatory for this prescription;
- the name of the industrial drug, the content of the extemporal medicinal form (the names of ingredients), the addressing to the chemist about the medicinal form preparation and its delivery from the drugstore are prescribed in Rumanian or Latin, legibly, clearly in ink or pencil, the corrections are forbidden;
- on the formulary it is admitted the prescribing of only one drug;
- there are admitted only the abbreviations specified in "General rules of drug prescribing";
- the quantity of the liquid substances is prescribed in milliliters, grams or drops; of the solid substances – in grams or units of international action;
- the administration way is prescribed in Rumanian or in the language spoken by the patient; there are not admitted such general indications as "Intern", "Known" etc.;
- the doctor's signature is confirmed by his personal stamp;
- the prescription formularies are in quantitative evidence;

Date	Received	Prepared	Tested	Liberated

PARTICULARITIES OF PRESCRIBING OF DRUGS, THE COST OF WHICH IS COMPENSATED ENTIRELY OR PARTLY

1. Prescriptions for the delivery of drugs the cost of which is compensated entirely or partly are prescribed on the prescription formulary No. 3.
2. The right of prescribing such prescription have only doctors of medico-sanitary units possessing special allocations for the payment of the drug cost.
3. On the prescription formulary No. 3 can be prescribed only drugs, which are included in the List of medicinal preparation for their prescribing or gratuitous or advantageous delivery.
4. On such a formulary can be prescribed only one drug. The prescribing will mention "General rules of drug prescribing".
5. The content and number of the prescription for prescribing or gratuitous delivery of drugs are obligatory inscribed in the medical card of the patient or in another medical document.
6. When a drug from the group of intoxicants or psychotropic is inscribed in the prescription, then it will be prescribed on the formulary No. 2 or formulary No. 1, too.
7. The term of validity of these prescriptions is 7, 10 days or 2 months, depending on the prescribed drugs.

Structure of prescription

The drugs are gratis delivered to certain patient's categories, determined by the respective decisions of the government (for children till the age of three years, handicap children, sick men with chronic tuberculosis, diabetes mellitus and insipidus, AIDS etc.)

The prescription consists of four parts: superscription, inscription, subscription, and instruction.

The prescription formularies have the superscription already printed.

The Superscription consists of the stamp of the sanitary institution or of the private doctor. The superscription ends with the addressing to the chemist with the word Rp.: abbreviation of the word Recipe – "take" (from the verb to take).

The Inscription, one of the most important prescription parts, contains the name of the drug in the officinal or industrial prescription; name of pharmaceutical form, in some cases also the respective doses and the **usage** number. In case of masterly medicines all ingredients of the solicited drug are listed, arranged according to their importance (the basic substance, the adjuvant substance, the corrective substance, the excipient). The dose of every substance is indicated from the right formulary part immediately after the substance name, in the same line with it or in the next one, but also from the right part.

Examples of inscriptions:

Rp.: Tab. Cimetidini 0, 2 N 100

The Subscription is a succinct indication about the pharmaceutical form of the specialty or the way of preparation of the drug if this is a masterly characteristic each one of them (Misce fiat pulvis etc.) and the number of **dosages** through the indication "Da tales doses numero 20" that means – deliver it in 20 such doses. Subscription is written in Latin.

Example:

Rp.: Streptocidi 0, 5
Vaselini 20, 0
M.f. unguentum
D.S.Extern, for burn cure.

The instruction or the signature is the last part of the prescription; it is often reduced to D.S. (Da. Signa.) that means "liberate". "label". After this follow the indications given to the patient, which are written in his native language. The indications start with the administration

way of the prescribed medicine (internal, sublingual, intra-rectal, intra-vaginal, external, inhalations, injectable etc), the way of administration, the **number of drug takings** during the day, the optimal moment of administration etc.

After writing out the prescription must be signed by the doctor and he applies his stamp.

III. THE DRUG (Generalities)

Classification of drugs

The principal task of the modern medicine is not only to prevent one or another disease and to perform different prophylactic actions, but also to fight against the disease.

The cure of the sick persons is done through different methods: the main one is the method of the medicine therapy. For the medicine therapy different chemical substances of mineral, vegetal, microbe and animal provenience are used, as well as chemical products obtained by synthetic ways. All of them have certain chemical composition and chemico-physical properties and in the contact with the alive-organism in certain conditions produce different changes, their level determining their practical utility (medicinal substance) or their harmfulness (poisonous substance).

The drug is a substance administrated with a view to prevent, improve, and cure or to diagnose a disease or a symptom.

Very often the drug is a pure substance, well defined from chemical point of view. Sometimes the drug is represented by a vegetal or animal product in the composition of which are more active substances, also called active principles responsible for the therapeutic effect.

The drugs are designated with more names:

- *The chemical name* exposes the complete structure of the substance, usually being long and difficult to remember.

- *The international common name* (ICN) exposes the chemical structure of the drug. This name is shorter and it is used in a current way. It is obligatory present in prospectus and on the drug packing, near the commercial name.
- *The commercial name* differs for the same drug from a country to other (synonyms). Generally this name exposes the chemical structure or the therapeutic effect and it is chosen in such a way so as to be easily remembered.

The typified or industrial drugs are prescribed with commercial names under which they are found ready prepared in drugstores.

The classification of drugs can be made according to certain criteria.

According to their origin the drugs can be natural (vegetal, animal or mineral), synthetic or semi-synthetic (obtained from natural substances, to which were made some chemical modifications in the formula).

According to the administration way there are distinguished drugs with a systemic (general) action, such drugs are administered on the digestive way (they are internally used and are considered oral administered), respiratory, parenteral way, and drugs with local action, which are externally used and applied on the skin and mucous membrane.

According to the toxicity it can be distinguished weak active drugs, high active drugs that are kept in drugstores in cupboards with inscription *Separanda* (ex: codeine) and potentially toxic drugs which are kept in the cupboard *Venena* (ex: atropine).

According to the preparation way, the drug can be obtained in the drugstore under fixed formulas written in pharmacopoeia (officinal drugs), or under individual prescriptions (masterly preparations), or are obtained in the pharmaceutical industry (typified or industrial drugs).

The origin, character and composition of the raw material

1. *Chemical defined drugs.* They contain one or more medicinal substances with mineral, biological, semi-synthesis or synthesis character, with physic constants and characteristic chemical properties obtained through:
   - The processing of mineral products;
   - The chemical synthesis or semi-synthesis;
   - The extraction from vegetal or animal products;
   - Controlled biosynthesis (antibiotics, steroid hormones, vitamins);
   - Different biotechnologies (peptidic hormones, endorphins).
2. *Non-chemical defined drugs.* They have a complex composition, contain mixtures with variable characteristics according to their origin and obtaining way. They are prepared through extraction from plants (phytocomplexes) or are obtained from animal products, microorganisms, or through the treatment of different minerals. To obtain products with constant quality, it is necessary to standardize the preparation method, the physic, chemical and biological properties.
3. *Drugs obtained from animal or vegetal tissues, animals or plants.* These are defined through the morphologic and histological characters (the cell structure).

Composition of the drug

The drug can be simple or compound. The simple drug consists of a single substance, called principal or basic substance, basis:

Example:

Rp.: Chloramphenicol 2,0
D.t.d. N5
S. Intern. One powder - three times a day.

The compound drug consists of some substances (two or more). The main role is played by the active substance, called basic substance, basis. The basis substance is written the first in the prescription, because it deter-

mines the therapeutic action of the drug. The others are auxiliary and accomplish certain functions destined to make the basic substance convenient for the use. Among the auxiliary substances an important role is played by the adjuvant, correctives and excipient.

Adjuvants

Adjuvants are called the compounds that advantage the action of the basis substance or remove some contrary effect.

Example:

Rp.: Pepsin 2,0

Diluted hydrochloric acid solution 2 % – 200ml

M.D.S. One spoon three times a day during the meal

The prescribed drug is destined to a person with gastric insufficiency. Being a proteolytical enzyme, the pepsin is destined to substitute the insufficiency of the proper enzyme of the patient for normalizing the digestion. But, as we know, the pepsin is active only in the acid medium (pH=1-2). The hydrochloric acid that is a component of a normal gastric juice creates such a medium advantaging the proteolytical action of pepsin.

This example shows how the adjuvant creates conditions for the effect increasing of the basis substance. So we can say that the adjuvants intensify the therapeutic effect of the basis substance or reduce it adverse effects.

Correctives

The correctives make the taste, smell or the colour of the drug more agreeable, such as - saccharine, aromatisation, stains etc. The syrups are more used (simple syrup, raspberry syrup etc.).

Example:

Rp.: Thermopsys herbs infusion 0,2 – 100 ml

Raspberry syrup 10 ml

M.D.S. Intern. One teaspoon - three times a day.

Raspberry syrup from the upper prescription has a corrective role.

Excipients

The excipient is the ingredient that permits the obtaining of the respective pharmaceutical form (tablets, ointments, suppositories, solutions, sprays etc.). For example, the purified water gives to the water-soluble medicinal substance the solution form, the Vaseline – ointment form, the cocoa butter serves to the obtaining of suppositories etc.

Example:

Rp.: Trimeperidine 0, 12
Cocoa butter 18, 0
M.f. suppositoria rectalia N 6
D.S. One suppository during the pain

Drug keeping

The drug quality depends on the conditions in which they are kept. Every drug must be packed and labelled. For this purpose special containers are used such as: boxes, bags, purses, thin sheets, blisters, ampoules, phials, envelopes, tubes etc., which should correspond to certain conditions. The drugs that must keep their sterility, such as parenteral forms are delivered in ampoules, phials, cartridges or other special containers. Every medicinal substance can undergo chemical modifications coming in contact with the oxygen or carbon dioxide from the air, with water vapours, or exposed to the solar rays or to a high temperature. That's why the drugs are kept in a cool, dark and well-closed place. Kept in ideal conditions the drugs, especially the antibiotics, organ preparations, by the time they lose their healing properties.

The medicinal substances are also distinguished according to their activity. According to their pharmacodynamics they can be divided in three groups: 1) very active substances, called also toxic or **Venena,** which constitute the **A table**. These, even in infinitesimal doses can unleash marked pharmacodynamic effects and present a dangerous intoxication. Also in the **A table** are placed the

intoxicant substances, utilized without measure that can lead to drug addictions; 2) compounds with middle pharmacodynamic force, substances called strong active or **Separanda**, that constitute **B table**; 3) substances with relative weak pharmacodynamic activity, which are not placed in the mentioned tables.

The preparations from **A table** in the drugstores are kept in cupboards or special safe. On the interior part of the cupboard or the safe door it is written **"A", "Venena"** with the list of the preparations kept in it.

Preparations from **B table** are very numerous and are kept in closed cupboards, on those interior parts of the door where it is written **"B", "Separanda"** and the list of the preparations, sometimes with the indication of their maximum doses.

Preparations from the third group are kept in habitual cupboards.

IV. AUXILIARY WORDS AND SYMBOLS IN PRESCRIPTIONS

Besides the medicinal substance names and indications addressed to the chemist, in the prescriptions the doctor also uses some words and conventional symbols, especially in the masterly prescriptions.

They are distinguished in:

I. Ad means till, until:

Rp.: Zinc oxide 1, 0
Vaseline ad 10, 0

In the prescribed drug the Vaseline occupies 9 grams, because to zinc oxide reverts 1 gram and to Vaseline the rest that remains up to 10 grams.

II. Ana (abbreviated āā) means "how many (much)" or "in equal parts" and it is used when the doses of two or more substances coincide:

Rp.: Salicylic acid
Resorcinol
Metronidazole āā 3, 0

In this drug prescription the salicylic acid, the resorcinol and the metronidazole are taken in equal doses of 3 grams. The āā follows always after the last ingredient taken in the same dose.

III. Cito! – means Fast! It is written in the right upper part of the prescription in case when the drug must be delivered urgently without delay.

IV. Gtt or gtts (abbreviation of words guttam or guttas that means drop (s)):

The number of drops is written with Latin figures, so in the case of the Mint oil will write guttam unam or guttas duas. The following examples show this:

Rp.: Mint oil gtt I

Rp.: Mint oil gtts II

V. # - the "diez" sign serves for delimiting of two prescriptions on a single formulary:

Rp.: Atenolol tablets 0. 05 N 50
D.S. Intern. One tablet a day.
#
Rp.: Ednit tablets 0, 0025 N 20
D.S. Intern. One tablet a day.

VI.! – the exclamation sign follows after the dose equal with the maxim dose for one time, in case when the doctor consciously prescribes it:

Rp.: Phenobarbital 0, 2 !
D.t.d. N 6
S. Intern. One dose before sleeping.

VII. Pro me (for me), pro autore (the author), pro usu proprio (for personal usage) are written in case when the doctor prescribes the drug himself. These words are written in the place of the patient's name.

List of principle abbreviations used in the prescriptions:

Abbreviation	Word, Latin expression	English equivalent
āā	ana	how many, in equal parts
Ac., acid	Acidum, -i	acid
a.c.	Ante cibum	before eating
ad lib.	Ad libitum	as somebody wishes, wants
amp.	Ampulla, -ae	ampoule
aq.	Aqua,-ae	water
aq. dest.	Aquaedestillata	distilled water
aq. purif.	Aquaepurificata	purified water
asp.	aspersio, -onis	powder
b.i.d.	bis in die	two times a day
Cap., caps.	capsula, -ae	capsule
Comp.	compositus, -i	compound
Cort.	cortex, -icis	shell, bark
Cr.	crema, -atis	cream
d.	dies,-ei	day
D.	da, dentur, detur	liberates
Dec.	decoctum, -i	decoction
dil.	dilutus, -i, dilute	diluted, dilute
div.	divide	devices
D.t.d.	Da tales doses	liberates such doses
el.	elixir	elixir
Empl.	emplastrum, -i	plaster
Em., Emuls.	emulsum,-i	emulsion
extr.	extractum,-i	extract
f.	fiat, fiant	to be
fl.	flos, floris	flower
fol.	folium	leave
fr., fruc.	fructus, -i	fruit
gel.	gelatinosus, -a, -um	gelatinous
gtt., gtts.	gutta, -ae, (guttam, guttas)	drop
hb., herb.	herba, -ae	grass, herb
i.m.	intramuscularis, -is, -e	intramuscular
i.v.	intravenosus, -a, - um	intravenous
in. amp.	in ampullis	in ampoules
inf.	infusum	infusion
Lin.	linimentum, -i	liniment
Liq.	liquor, -is	liquid, drink
M.	misce	mix up
mcg	microgrammata	micrograms
mg	miligrammata	milligrams
mixt.	mixtura, -ae	mixture

ml	millilitrum, -i	milliliter
Mucil.	mucilago, -inis	mucilage
N	numero	number
non rep.	non repetatur	do not repeat
Ol.	oleum, -i	oil
p.o.	per os	intern
pro inj.	pro injectione	injectable
pulv.	pulvis, -eris	powder
qd.	quotidie, quque die	every day, daily
q.i.d.	quater in die	four times a day
q.s.	quantum satis	how much it is necessary
q.s. ad	quantum satis ad	how much it is necessary till the
rad.	radix, -acis	root
Rep.	repetatur	to repeat
rhiz.	rhizoma, -atis	rhizome
Rp.	Recipe	take
S.	Signa	label
s.	Seu	or
sem.	semen, -inis	seed
sicc.	siccus, -a, -um	dry
simpl.	simplex, -icis	simple
s.l.	sub lingua	under tongue
Sol.	solutio, -onis	solution
Sp.	species, -ei	species
Steril.	sterilisetur	sterilize
stigm.	stigmatum, -i	stigma
subt.	subtilis, subtilissimus, -a	subtle, fin, extrafin
supp.	suppositorium, -i	suppository
Susp.	suspensio, -onis	suspension
Sir.	sirupus, -i	syrup
Tabl.	tabuletta, -ae	tablet
t.i.d.	ter in die	three times a day
Tinct., T-ra, Tct.	tinctura, -ae	tincture
Ung.	unguentum, -i	ointment
V.	Verte	reverse (verso)
vitr.	Vitrum	glass

V. DRUG PRESCRIPTIONS

Depending on the formulary the drugs are classified in three groups:

Masterly prescription

Masterly drugs. These are prepared in drugstores, on demand, on the basis of the medicinal prescription, which is individualized for the patient. The drugs have a short keeping standing, are prepared in small quantities and are destined for an immediate use. The term of these drugs comes from the name of the leader of this unit, called master (Latin *magister*) that means the name given to the professors by the students.

The prescriptions prescribed by the doctor, which were difficult in preparing and were discussed with the students and were made by the master, are called masterly drugs. They were prepared in a way that ensured their stability, being liberated under an esthetical form and were prepared "masterly". So the masterly drug is an "ex tempore" (Latin = immediately, in hurry) preparation as a unicum completed by the chemist based on certain medicinal prescription for a patient.

The masterly prescription is called in such a way because the physician assumes the teacher's role of the chemist, indicating all drug ingredients, their doses and in some cases even the preparation way.

Example of masterly prescription:

Rp.: Papaverin Hydrochloride
Phenobarbitali āā 0, 02
Sachari lactis 0, 3
M.f.pulvis
D.t.d. N. 6
S. Internal, one powder three times a day.

Officinal prescription

Officinal drugs. These are inscribed in pharmacopoeias, having a formula established with the view to generalize the preparation method and to have conditions of im-

posed qualities; they have a long keeping standing and a large utilization. These drugs are prepared in drugstores in big quantities, from which are made divisions and can be immediately delivered to the patient, on demand, with or without medicinal prescription. These drugs can also enter the formula of some masterly preparations.

The meaning of the word derives from the compulsories that existed in the first pharmacopoeias, in order to provide the drugstores with all pharmaceutical forms; also in the group of officinal products were included the vegetal drugs.

In the group of the officinal drugs are also included:

- Drugs prepared and conditioned in industry and delivered by the chemist, under his label; also called divided officinal products (D.O.P.);
- Drugs prepared in industry, delivered in bulk at the drugstore's laboratory and conditioned in the drugstore.

The officinal or pharmaceutical prescriptions (from Latin officina - drugstore, institution where sometimes were prepared exclusively the drugs) have a recent provenience. In comparison with the masterly indications the officinal indications are fixed, standard and cheaper. In the officinal prescription it is indicated only the pharmaceutical name of the drug.

For example: the upper prescribed ointment can get some name, such as "Hydrocortisoni" and more simple prescribed:

Rp.: Ung. Hydrocortisoni 0, 5 % - 10, 0
D.S. Extern.

Industrial drugs (synonyms: *pharmaceutical products* or *pharmaceutical specialties*).

Today they play the most important role in drugstore delivering (90 %).

The specialty is a drug, earlier prepared and presented under a particularly conditioning and characterized

through a special name, given name – mark, or commercial name.

The nomenclature of the industrial drugs can be given by:

- Chemical name that reproduces the chemical structure of the medicinal substance; it is usually complicated and seldom used;
- International common name (I.C.N.), proposed or recommended by W.H.O. and has the aim to generalize the name of medicinal substance;
- Officinal name explored by pharmacopoeia and which represents the officinal name from the respective country;
- Commercial name, registered (noted with the abbreviation R) or not, established by the producing firm; it is simple, easy to remember, but not always suitable. The big number of the commercial names represents today a seriously difficulty for drug cognition.

The following elements are presented on each conditioning unit (container and packing):

- Product name;
- Pharmaceutical form;
- Product formula (composition);
- Unit number or content;
- Administration way;
- Keeping cautions;
- Validity term;
- Name and address of the producer (firm);
- Factory mark;
- Number of fabrication charge;
- Price of the costs.

The mark of a drug represents its name, with which the drug is brought into circulation by a factory (firm, society) under the form of a visible sign, applied on the label and on the packing.

A pharmaceutical drug is considered every industrial drug containing a medicinal substance and delivered under the registered name.

Industrial prescriptions or specialties are prescribed like the officinal. The manufacturing firm determines the preparation composition.

Example:

Rp.: Theophedrin tablets N 20.

D.S. Intern. One tablet - three times a day.

VI. THE DOSE

Description and types of doses

The dose (from Latin dosis – dose, portion) is a drug quantity administrated for one consumption or for a period of time and produces a certain biological effect. The expression of adult therapeutics is made in: g, mg, ml, biological units; reported to the global weight (considered 70 kg for adult) or on kg body for the strong active substances.

In paediatrics, the expression is made reported to kg body or on m^2 body surface. There are monograms for body surface calculation, depending on age and height.

The establishment of doses is important for the prescription elaboration, cure setting up and for the experimentation of medicinal substance.

The types of dose used in therapeutics depend on some therapeutic criteria:

- Regarding the duration of the cure there are doses: for one use, for 24 hours, for a cure;
- According to the modality and speed of realization of the therapeutic equilibrium state in emergencies there are: attack (stroke) doses, maintaining doses;
- Regarding the intensity of the biological effects there are: effective (that produce the pharmaco-

therapeutic effect), toxic (that produce intoxications) and lethal (that produce death) doses.

The attack dose (Da) is the initial dose that realizes the sanguine or efficient tissual concentration in the equilibrium state in a short period.

The maintaining dose (Dm) maintains the efficient concentration in the steady state, being equal with the quantity eliminated from the organism.

The efficient doses are extended in the therapeutic manageable zone, between the minimum efficient dose and the maximum tolerated dose (DM).

The therapeutic index (IT) is an indicator of the therapeutic assurance and it is given the ratio between the minimum efficient dose and maximum tolerated one, related to the 50 % of persons.

IT = DmE50 / DM50

Adaptation of doses

The calculation of doses (D) depending on the age

Human age:

- under 1 year, new born, suckling
- 1 – 12 years, child
- 12 – 20 years, teenager
- 20 – 70 years, adult
- over 70 years, old

Dose calculation for children (1 - 12)

Dilling Formula:

$$D_{child} = A \times D_{adult} / 20$$

Young Formula:

$$D_{child} = A \times D_{adult} / A+12$$

Cowlling Formula:

$$D_{child} = A \times D_{adult} / A+24$$

The calculation of the doses for old persons (more than 70 years):

$$D_{old} = 1/2 - 2/3 - 3/4\ D_{adult}$$

The calculation of doses (D) depending on the weight

Hamburger Formula: $D_{child} = \frac{A}{20} \times D_{adult}$

In fatness, it is remarked the volume of distribution (Vd) and the reference to:

- the real weight in case of the lipophil drugs;
- the ideal weight, in case of the hydrophilic drugs.

The calculation of doses (D) depending on the corporal surface

In children and young men (1/2 – 20 years), the renal and metabolic clearance is well correlated with the corporal surface, that's why the dose adaptation is more correctly made, referred to the corporal surface.

In more than 20 years, the renal function decreases approximately 1 % per year.

$$D_{child} = S\ (m^2) / 1,73\ m^2 \times D_{adult}$$

where: 1,73 m^2 = is the corporal surface of the adult with 70 kg.

The corporal surface of the child can be directly calculated with the help of special graphics called nomograms and the following tables:

Correlation between the age, corporal surface and the dose recommended for children

Age (years)	Surface (referred to the adult's surface)	Dose (fraction from the adult's surface)
1/2	1, 8	1/5
1	1, 6	1/4
3	1, 6	1/3
7	1, 4	1/2
12	1, 2	2/3
Adult	1, 0	1

The corporal surface is proportional with the corporal weight at the power of 0, 7. So is the formula:

$$D_{child} = G\ (kg)^{0,7} / 70^{0,7} \times D_{adult}$$

The calculation of attack dose (Da)

The calculation of an attack dose (*Da*) can be used regarding the case of the following relations:

a) $Da = Cp \times Vd$,

where: Da = attack dose (mg/kg);

Cp = desired plasmatic concentration (mg/l or mg/ml);

Vd = volume of distribution (l/kg).

The plasmatic concentration (*Cp*) can be:

- *Cp* (ss) = *Cp* average in "steady state";
- *Cp* (min.) = *Cp* minimum (effective or inhibitive).

Cp (ss) is used: for cardiotonics, anti-arrhythmic, anti-asthmatics and *Cp* (min.) for antibiotics.

b) $Da = Dm \times R_{AC}$,

where: Dm = maintaining dose;

R_{AC} = accumulating factor.

and: the accumulating factor (R_{AC}) can be given by the relation:

$$R_{AC} = 1 \,/\, 1 - e^{-\varepsilon} = 1 \,/\, 1 - e^{-Ke \times \tau}$$

where: ε = relative interval between the consumptions

$$\varepsilon = \tau \,/\, T1/2 = Ke \times \tau \,/\, \ln 2$$

The calculation of the maintaining dose (Dm)

The plasmatic concentration of that the maintaining dose (*Dm*) is optimized can be:

- Average concentration in "steady state" (C_{ss});
- Minimum concentration ($C_{min.}$);
- Ratio between maximum concentration and minimum concentration ($C_{max.}/C_{min.}$).

a) *The calculation of Dm, function of* C_{ss}.

This calculation is applied to the drugs for which the curve log dose-effect is a sigmoid; for example: cardiotonic glycoside, anti-arrhythmic, anti-asthmatics etc.

According to the definition, in the equilibrium state in the interval between two consumptions (τ), the entering of the active substance equilibrates its elimination from the

organism. Conseguently the *Dm* will be calculated according to the formula:

$$Dm = C_{ss} \times Cl_T \times \tau / F, \text{ so } Cl_T = Dm \times F / C_{ss} \times \tau,$$

where: F = bio-reserve fraction; F = 1 on the intravascular way;

Dm = maintaining dose (mg/h/kg or mg/min/kg);

C_{ss} = average plasmatic concentration in "steady state" (mg/l or mg/ml);

τ = interval between the doses (h);

Cl_T = total clearance (l/h/kg or ml/min/kg).

and $Cl_T = Ke \times Vd = 0{,}693 / T1/2 \times Vd,$

where: Ke = elimination constant.

When after "n" administrated Dm (= Dm test), C_{ss}, measured to the patient (C_{ss} *patient*), is not concordant with C_{ss} aim, expected by the doctor, then Dm is corrected (= Dm optimised), according to a direct proportional relation:

$$Dm_{(optimized)} = C_{ss}(aim) / C_{ss}(patient) \times Dm_{(test)}.$$

b) *The calculation of Dm, function of* C_{min}.

This calculation is applied to the drugs necessary for attainment and maintaining of a minimum plasmatic concentration ($C_{min.}, \infty$).

Beginning with the equations:

$$D = C \times Vd \quad \text{and} \quad C_{min.(\infty)} = Dm/Vd \times e^{-Ke\times\tau} / 1 - e^{-Ke\times\tau},$$

where: $e^{-Ke\times\tau}$ = fraction from the last dose, that remains in the organism by the end of the interval τ (= "residual level").

It is fixed the relation between τ and Dm:

$$\tau = T½ / 0{,}693 \times ln\,[1 + F \times Dm / Vd \times C_{min.(\infty)}]$$

When after the first dose Dm, the $C_{min.}$, measured to the patient ($C_{min.}$ patient) is not concordant with C_{ss} aim, expected by the doctor, then Dm is corrected according to the relation:

$$Dm_{(optimized)} = C_{min.}(aim) / C_{min.}(patient) \times Dm_{(test)}.$$

c) *The calculation of Dm, function of minimum fluctuation between* $C_{max.}$ *and* $C_{min.}$

This calculation is applied to the drugs with the narrowest therapeutic zone; for example: ethylmorphine hydrochloride, theophylline.

The posologic instalment must fulfil and maintain the patient between fixed minimum concentration ($C_{min.}$) and maximum concentration ($C_{max.}$) (aim concentrations).

By the equilibrium state, in the interval between two consecutive consumptions the amplitude of fluctuations between $C_{max.}$ *and* $C_{min.}$ is given by the equation:

$$C_{max.\,(\infty)} / C_{min.\,(\infty)} = e^{+Ke \times \tau^*}$$

The maximum interval between consumption (τ^*) is given through the relation:

$$\tau^* = T\frac{1}{2} / 0,693 \times ln\ C_{max.\,(\infty)} / C_{min.\,(\infty)}$$

and: $C_{ss} = C_{max.\,(\infty)} + C_{min.\,(\infty)} / 2.$

Dm is calculated on choosing a value of τ that is inferior to τ^*.

Drugs elimination. Clearance

The elimination is quantitative expressed by the clearance.

The clearance is a pharmacokinetic parameter that expresses the quantitative elimination process.

Clearance types:

- The total systemic clearance;
- The plasmatic clearance;
- The clearance of an organ:
  - Hepatic;
  - Renal;
  - Biliary.

Clearance

The total systemic clearance (Cl_T)

The total systemic clearance expresses all processes that intervene in the elimination of a drug from the organ-

ism, and represents the sum of partial clearances of the biotransformation (Cl_H) and of the elimination (Cl_E):

$$Cl_T = Cl_H + Cl_E$$

But $Cl_E = Cl_R + Cl_{nR}$, than $Cl_T = Cl_H + Cl_R + Cl_{nR}$,

Where:

Cl_R = renal clearance;

Cl_{nR} = nonrenal clearance.

The nonrenal clearance (Cl_{nR}) can have the function of a drug:

biliary, respiratory, coetaneous.

The total systemic clearance (Cl_T) is equal with the distribution volume quantity (Vd)(1/kg) from which the medicinal substance was eliminated in the time unit (hour) and is expressed in 1/hour/kg. According to this definition:

$$Cl_T = K_e \times Vd,$$

where: K_e = const. of the elimination;

Vd = apparent distribution volume.

The total systemic clearance reflects the speed of the elimination rated to the drug concentration in the biological liquids:

$$Cl_T = Ve/C$$

The plasmatic clearance (Cl_p)

The plasmatic clearance (Cl_p) is defined as a plasma volume (ml or l) from which the drug was eliminated in the time unit (minute or hour) and is expressed in ml/min or l/hour.

It can be calculated according to the formula:

$$Cl_p = D/C_p$$

where D = dose in mg/hour or mg/min;

C_p = plasmatic concentration in mg/l or mg/ml.

The clearance of an elimination organ ($Cl_{org.}$)

The clearance of an elimination organ ($Cl_{org.}$) shows the efficiency with that of the respective organ (liver, kidney etc.) is eliminated the plasma.

It is calculated according to the formula:

$$Cl_{org.} = Q \times C_A - C_V/C_A$$

where:

Q = sanguine flux at the organ level (l/min);

C_A = drug concentration in the afferent arteriole of the organ (mg/l);

C_V = drug concentration in the efferent venule of the organ.

The extraction speed of the organ is:

$$V_E = Q(C_A - C_V).$$

The extraction coefficient of the organ is:

$$E = C_A - C_V/C_A$$

The clearance of the organ ($Cl_{org.}$) depends on:

- the intrinsic clearance ($Cl_{int.}$) of the organ for the elimination of a drug from the plasma;
- the perfusion with the blood of the organ (Q).

$$Cl_{org.} = Q \times Cl_{int}/Q + Cl_{int}$$

where:

$Cl_{int.}$ = the intrinsic clearance of the organ.

When $Cl_{int.}$ is bigger than Q, then $Cl_{org.}$ depends on the value of Q.

When $Cl_{int.}$ smaller than Q, then $Cl_{org.}$ is independent from the Q.

VII. NAME AND NOMENCLATURE OF DRUGS

The medicinal substances have some names: a) chemical,

b) International non-proprietary, c) commercial, d) officinal.

Chemical names are the realest and most correct that describe the substance structure in a laconic and certain language. At the same time these names are the most uncomfortable and difficult in utilization. They are used only in the cases of inorganic compounds. In the case of organic substances, their chemical names are too difficult to remember.

Officinal names for drugs are stipulated in the pharmacopoeia in force of each country.

World Health Organization (W.H.O.) establishes international non-proprietary names (INN), also called original (unlicensed).

The unlicensed drug names are established on the basis of three principles:

- The clearance of the pronunciation and of the indication;
- The difference from the other names;
- The affiliation to the preparations those are similar in form or action mechanism.

In forming of the international common names W.H.O. recommends the following segment-key utilization:

Segment-key	The pharmacology group	Drugs
- arol	Anticoagulants	Acenocumarol
- azepam	Benzodiazepins	Diazepam, Oxazepam
- cain	Anaesthetics	Lidocain, Procain
cef -	Cefaphalosporins	Cefalexin, Cefazolin
- cilin	Penicillins	Amoxicilin, Oxacilin
- ciclin	Theraciclins	Doxiciclin, Metaciclin
- estr -	Estrogens	Megestrol, Gestrinon
- fibrat	Hypolipidemiants (intermissions work)	Ciprofibrat, Fenofibrat
- statin	Hypolipidemiants (statins)	Lovastatin, Ravastatin, Simvastatin
- formin	Hypoglycemics (guanidines)	Buformin, Metformin
gli -	Hypoglycemics (Sulphamides)	Gliclazid, Glipizid
- nidazol	Antiprozoics	Metronidazol, Tinidazol
- olol	â- adrenoblockers	Propranolol, Xprenolol
- pramin	Antidepressants	Clomipramin, Melipramin
- prost	Prostaglandins	Dinoprost, Alprostadil
sulfa -	Sulphamides	Sulfadimizin, Sulfalen
- terol	Bronchodilators	Fenoterol, Clenbuterol
- tiazid	Diuretics (tiazides)	Ciclometiazid, Hidroclortiazid
- verin	Spasmolytics	Drotaverin, papaverin

The specialties are commercial or mark names, the mark or the registered Trademark (Registered Trade Mark) or brand names. They have the sign ® that means registered. Every pharmaceutical firm registers its preparation names. Under the commercial name it is very important to indicate the international non-proprietary name. The commercial names are widespread, very different and easy to remember.

VIII. PHARMACEUTICAL FORM

For being used, the medicinal substance must be exposed to some technological processes, after that it gets a certain medicinal form, named medicinal or pharmaceutical form. The same active principle may appear under different medicinal forms depending on their destination, their pharmacological, chemical and physio-chemical substance properties, and on the therapeutic doctor's tactics. For example the chloramphenicol can be in tablets, ophthalmic solution and dermatological ointment.

The medicinal forms are divided into: solid, semisolid or soft, liquid and gaseous.

Solid medicinal forms

- Powders (unmeasured, effervescent, measured in envelope, for syrup preparation, for drinkable suspension preparation, for drinkable drop preparation, for external uses or powders);
- Granules (unmeasured, effervescent, measured in envelope, for drinkable suspension preparation);
- Capsules (hard or gel capsules, retard capsules, enterosoluble capsules, vaginal capsules, elastic capsules);
- Tablets (retard tablets, rapid-retard tablets, sucking tablets, chewing tablets, effervescent tablets, enterosoluble tablets, paediatric tablets, vaginal tablets, implants, tablets for solution preparation);
- Dragees (usual, retard, enterosoluble, packed);
- Pills;

- Pellicles and plates;
- Species;
- Caramels;
- Pencils;
- Briquettes;

Semisolid or soft medicinal forms

- Ointments (dermal, ophthalmic, nasal, vaginal, rectal);
- Pastes (dermal, stomatologic);
- Suppositories (rectal, vaginal or ovule);
- Plasters;
- Therapeutical systems (transdermal device, intrauterine device);

Liquid medicinal forms

- Solutions
- Suspensions
- Drops
- Parenteral forms
- Extractive solutions (watery, alcohol, oily)
- Maximum purified extractive solutions
- Emulsions
- Liniments (dermal, ophthalmic)
- Syrups
- Aromatic waters
- Medicinal juices
- Mixtures
- Alcohols
- Soaps
- Elixirs
- Vinegars
- Medicinal wines

Gaseous medicinal forms

1. Aerosols (oral, nasal, for inhalations, dermal, vaginal).

Solid medicinal forms
Powders (Pulveres)

The powders are pharmaceutical forms with powdery aspect, formed from uniform particles of one or more active substances, associated or not with other auxiliary substances. They are destined for internal, external or parenteral use. They can be simple or compound, the powders that contain one substance (active substance) are named simple; the powders that contain two or more active substances or at least one active substance are named compound.

The powders for internal use are taken with water or other convenient liquids. They can be simple or compound. They are classified in undivided or unmeasured and divided or measured.

Undivided powders. The undivided powders are divided in simple and compound. *The undivided simple powders* are formed from one substance, liberated to the patient in sufficient quantities for the whole cure. The patient measures it himself with available possibilities at home.

Example:

Rp.: Polyphepan 50,0
D.S. Intern. $^1/_2$ teaspoon three times a day.

Undivided compound powders consist of some active substances, in some cases also auxiliary substances, which are prescribed for a cure without being divided in doses for one consumption.

Example:

Rp.: Dimedroli
Papaverini hydrochloric āā 0, 02
Phenobarbitali 0, 01
Sugar 0, 03
M.f.pulv.
D.t.d. N 10
S. Intern. One teaspoon - three times a day.

For compound powders it is necessary the indication "Misce ut fiat pulvis" (M.f.pulv.)

Divided powders are given to the patient in unique packed doses, each for one consumption. They are also divided in simple and compound divided powders. Divided simple powder can be any solid substance; its dose is in the limits of 0,1 – 1 g (in some cases more).

Example:

Rp.: Pancreatini 1, 0
D.t.d. N 10
S. Intern. One dose three times.

At the moment nearly all divided powders are compound, because they contain besides the active substances saccharine, aromatisation, colourings etc.

Compound divided powder. In case when the substance active dose is less than 0,1 g it is added neuter substances for making normal the mass of the divided powder. The mass of the compound divided powder is brought to so-called medium or optimal mass which is equal to 0,3–0,5 g. Auxiliary used substances have the role of an excipient. As excipient for compound divided powders there are used: sugar, glucose, sodium hydrocarbon.

Example:

Rp.: Phenobarbitali 0,05
Sugar 0,3
M.f.pulv.
S. Intern. One powder three times a day.

Powders for external use
(Pulveres subtilissimi, aspersiones)

The external used powders are extra-subtle for the better skin adhesion. As excipient they contain talcum, starch or other produces. They are externally applied powdering the harmed surfaces of the skin. They easily adhere to the skin, magnify their evaporation surface and dry it. There are simple and compound powders. Simple powders

consist of one substance and the compound powders consist of two or more. The simple powders contain a medicinal substance scrubbed till the extra-subtle form, destined to the external use for skin lesion cure.

Example:

Rp.: Streptocidi subtilissimi 30,0
D.S. For external use

Compound powders

When an active substance must be used in small or infinitesimal quantities, this is mixed with neutral powders, such as talcum, kaolin, starch building with them a compound powder. These substances have the role of an excipient; they modify the concentration of the active principle and the effect of the powder. The optimal concentration can be found in the specialty guidebooks.

Example: To prescribe 50,0 powder 5 % anaesthesin

The officinal method

Rp.: Anesthesin powder 5 % - 50,0
D.S. For external use

The masterly method

Rp.: Anesthesin 2,5
Talcum ad 50,0
M.f.asp.
D.S. For external use.

The calculation of the active substance dose in the masterly prescription is made resulting from the recommended powder concentration (in the case of anaesthesin 5 %). The percent indicates, how many active substance grams are found in 100 g. of powder. So 100 of powder contain 5 g. of anaesthesin (5 g. – 100 g.), and 50 g. of powder contain x g. of anaesthesin. This means:

5 g. ---------- 100 g.
x g. ----------50 g.

$$X = \frac{5 \times 50}{100} = 2,5 \text{ g.}$$

Granules (Granulae)

Granules are solid pharmaceutical preparations, which consist of particles with irregular, vermicular, cylindrical or spherical form. They contain active and auxiliary substances and are orally administrated. Within the auxiliary substances there are sugar, glucose, lactose, starch, dextran, aromatic substances, stuffs (colorants) etc. They are one of the forms that are the most adequate for children, because they permit an exact dosage and have high bio-reserve and excellent organoleptic properties. They are like powders and can be unmeasured and measured. There are effervescent granules; all are prescribed as simple undivided powders. Before using the granules are dissolved in water in which they form simple solutions, inclusively effervescent, or drinking suspensions.

Example:

Rp.: Granularum Natrii para-aminosalicylatis 150,0
D.S. Intern. One teaspoon to one glass of water six times a day.

Capsules (Capsulae)

Capsules are pharmaceutical forms formed from soluble covers that contain unitary doses of active substances associated or not with auxiliary substances. The majority of capsules are administrated in oral form, but there are also rectal and vaginal capsules.

The capsules are a medicinal convenient form because it protects the medicinal substances from air, humidity, and light and hide their unpleasant taste or smell. In most of cases the capsules are made of gelatine - gelatinous capsules (Capsulae gelatinosae). There are two kinds of gelatinous capsules: operculum or hard and elastic capsules.

The operculum capsules (operculum means lid) consist of two cylindrical lids that enter one in another building a cover for powders, granules, microgranules or micro-

capsules. The extremes of capsules are rounded for easy deglutition. Usually they are entirely swallowed, but it is seldom permitted their opening and the dose fractional distillation. Capsules are easily dissolved in gastric medium (5-15 minutes), liberating the contain.

Example: To prescribe 20 capsules with ranitidine in 150 mg dose.

Rp.: Ranitidini 0,15
D.t.d. N. 20 in gel. caps.
S. Intern. One capsule before eating - three times a day.

Active substances, inactivated in the acid medium of the stomach (polypeptide hormones, enzymes etc.) are given in **enterosoluble capsules**. These are made from gelatine processed with tannic acid or covered with a thin stratum of acid-resistant special substances to resist to the gastric juice action and for leading the active substances in the duodenum.

Example: To prescribe 20 capsules with pancreatine in 150mg dose.

Rp.: Pancreatini 0,15
D.t.d. N. 20 in gel. caps.
S. Intern. One capsule before eating - three times a day.

The retard capsules succumb the active slow principle a long time term (12-24 hours) and can be taken once or twice a day.

Example:

Rp.: "Corinfari" 0, 5
D.t.d. N. 20 in capsulis retardis
S. Intern. One capsule a day.

The elastic capsules have an ovoid form (capsulae gelatinosae moles) or spherical - called pearls. They usually contain liquid substances with unpleasant taste.

Example:

Rp.: Extracti Filicis maris spissi 0, 5
D.t.d. N. 10 in capsulis gelatinisis elasticis
S. to take all capsules during 30 minutes.

Microcapsules. The microcapsulation is a method of some little particles including a protector individual cover. Microcapsules have in diameter 0, 5 – 200 micrometers. Microcapsules are used with the view to prolong the drug action, due to slow elimination of the active principles.

Methods of microcapsules obtaining:

- Coacervation
- Fluidisation
- Polymerisation etc.

Microcapsules and microdragees can be included in certain operculum capsules called in this case retard capsules. They can also be included in tablets called retard tablets.

Tablets (Tabulettae)

Tablets are measured pharmaceutical solid forms - obtained through compression of one or more medicinal substances and auxiliary substances.

The tablets are prepared in pharmaceutical laboratories or factories through special technologies. Besides the active substance in their composition can be used some auxiliary substances, such as diluted, binders, lubricants, disintegrates. The diluted substances (glucose, lactose, starch) serve to the active substance dilution in case when its dose is very small. The binders (10 % gelatine, 50 % glucose, 50 % sugar, 10 % polyvinilpirolidon) strengthen the tablet giving it the necessary form and strength. The lubricant substances (stearic acid, talcum, PEG 4000 – 6000 etc.) relieve the technological slippery process of the

tablet through the compression machine. Disintegrates (soluble starch, gelatine etc.) have the role of tablet disintegration with the aim of medicinal contain liberating.

Usual tablets are swallowed entirely or crisped. In the liquid medium of the stomach they are disintegrated in some minutes and liberate active substances, which are absorbed in the systemic circuit or exert their action in the gastric-intestinal tract.

According to their using way the tablets are: oral tablets which are entirely swallowed, with systemic or local action; effervescent tablets which before being used are dissolved in water; oral or sublingual tablets which are distinguished to local action; chewing tablets, which after mastication can be easily swallowed; implantable tablets, vaginal tablets etc.

There are some prescription forms of tablets:
Example I variant:
Rp.: Acycloviri 0, 02
D.t.d. N. 10 in tabulettis
S. Intern. One tablet - five times a day.
Example II variant:
Rp.: Tabulettam Acycloviri 0, 02
D.t.d. N. 10
S. Intern. One tablet five times a day.
Example III variant:
Rp.: Tabulettam Acycloviri 0, 02 N. 10
D.S. Intern. One tablet five times a day.

Compound tablets are prescribed in the same way too.
Example:
Rp.: Acetylsalicylic acid 0,21
Caffeine 0,05
D.t.d. N. 10 in tabl.
S. Intern. One tablet in headache.

Varieties of tablets

Pellicle tablets are covered with a thin pellicle constituted from natural or synthetic resins, gums etc. Sometimes aromatic substances, sugars are added. The pellicle is smooth, often brilliant, coloured.

Example:

Rp.: Riboxini 0, 2 N. 50

D.S. Intern. One tablet a day.

Effervescent tablets are dissolved in water, where carbon dioxide is formed owing to the incorporation in them of any organic acid (usually citric or tartaric) and of any bicarbonate or any carbonate (sodium or potassium) the adequate proportion. They are taken only after the complete water dissolving (50-150 ml).

Example: Aspirin UPSA (Acetylsalicylic acid, 500 mg), Efferalgan (Paracetamol, 500 mg).

Oral or sublingual tablets are held under the tongue until the total absorption of the active substance, quickly produced, owing to the rich vascularization of this region. The sanguine sublingual vessels are flowed in the superior vena cava and the preparation hits directly in the systemic circuit and not in the portal circuit.

Example:

Rp.: Nitroglycerini 0, 0005 N. 50

D.S. Sublingual, in case of access.

Chewing tablets contain special chewing gums and are destined for chewing in the oral cavity. The active substances exert the action in the oral cavity or oropharynx, or are swallowed with the saliva and are absorbed by the oral mucous membrane. Children and young people use them.

Enterosoluble tablets are tablets with protector pellicle; the only difference is that their cover is acid-resistant, formed of one or several substance layers, which resist to the gastric juice action for the passing possibility

of the entirely nondisintegrated in the gastric juice tablet. Enterosoluble tablets must be not broken or crisped.

Example:

Rp.: Tab. Indometocini 0, 05 N. 30

D.S. Intern. One tablet a day.

Retard tablets liberate slowly and longer the active substance because they are incorporated in microcapsules with a small giving up speed or with other more sophisticated methods. They are convenient because they reduce the number of the consumptions from 2 to 1 per day; maintain the plasmatic concentration of the active substance at a relatively constant level.

Example:

Rp.: Tab. "Nitrong retard" N 30

D.S. Intern. One tablet in the morning.

Tablets for solution preparations (Solvellae) contain one or more medicinal substances and represent a convenient form of the measured substance, permitting the solution - obtained for external use.

Example:

Rp.: Solvellarum Penicillini et Natrii citrisi N. 10

D.S. Every tablet to be dissolved in 10 g. of water.

1 – 2 drops twice a day in both eyes.

Implantable tablets are introduced subcutaneously through incision or through special syringes. They remain in the administrated place for a certain time, usually for several months or years, from where the active substance is slowly and uniformly absorbed in such way that its level in blood and effect should be constant.

Vaginal tablets are introduced in vagina, exerting a local action. Some of them contain foaming substances for easing the total covering of the mucous membrane. Usually they contain antibacterial, anti fungible, antiprotozoan principles, hormone. For a more convenient introducing, some of them are directly delivered in applicators. The applicator represents a tube with a thickness of 5 – 8 mm

and with a length of 12 cm with the tablet on the one extremity and with a propeller on the other. The extremity with the tablet is deeply introduced in the vagina in a recumbent position, then the propeller is pushed, after that the applicator is drawn out and thrown.

Example:

Rp.: Chlotrimasoli 0, 5
D.t.d. N. 10 in vag. tab.
S. Intravaginal.

Dragees (Dragee)

Dragees are solid medicinal forms formed of two covers, one is internal - the nucleus containing the active substance and the other is external with sugar cover or other excipient.

In the composition of drake there are medicinal and auxiliary substances (sugar, starch, ethyl cellulose, talcum, magnesium carbonate, chocolate, cacao etc.) the dragee weight is not bigger than 1 g and has a spherical form.

Example:

Rp.: Dragee Dicolini N. 10
D.S. One dragee twice a day.
Rp.: Dragee Propazini 0, 025
D.t.d. N. 10
S. One dragee two times per day.

There are also microdragees – they are obtained from applying of medicinal substance and sugar syrup (as sticking substance) on small sugar seeds. Microdragees have a diameter of 30 – 40 mcm.

Spansules (Spansulae)

Spansules are capsules for internal use containing a microdragee mixture with different dissolving terms of the medicinal substances. In spansules there can be mixed three, four and more than five types of microdragees. In a

spansula there can be mixed 50 – 400 microdragees, and also suspensions and liquids.

Example:

Rp.: Spansulae Feospani N. 100

D.S. One spansule three times a day.

Pills (Pilulae)

The pills are a medicinal masterly dosed form, consisting from the active principle and the pill mass. The pill excipient is also called pill mass and consists from a mixture of extracts of some plants (Pulvis et Extractum rad Glycyrrhizae, Extractum Absinthii, Extractum Taraxaci etc.) and other substances such as honey, ethylic alcohol, starch etc.

The prescription

In pills prescription the medicinal substance that constitutes the pillar mass, is prescribed in necessary quantity for the preparation of all pills – this means that the unique dose of one substance is multiplied with the prescribed pills quantity. The prescription will be masterly.

Example:

Rp.: Extr. Belladonnae sicci 0, 45
Extr. Rhei sicci 3, 0
Extr. Glycyrrhizae spissi q. S.
Ut f. Pil. N. 30
D.S. 2 pills per night.

Rp.: Acidi arsenicosi anhydrici 0, 03
Extr. Et pulv. Rad.
Glycyrrhizae aa 3, 0
M.f. pilulae N. 30
D.S. 1 pill three times a day.

Calculation:

For 30 pills it is necessary to take Acidi arsenicosi anhydrici 0, 01 × 30 = 0, 03. One pill weighs 0, 2 g. this means that 0, 2 × 30 = 6g. Our pill mass consists of two substances – extract and Glycyrrhizin bark powder. So for each substance is taken 6,0 : 2 = 3g

Caramels (Caramel)

The caramels are a medicinal solid form prepared through mixing way with sugar and non-hydrolysed starch. Then is added aromatic, colouring, tasting substances. Usually they are held in the oral cavity where they are dissolved liberating the active principle and exerting a topical action. Caramels are prescribed in a short form because they are officinal.

Prescription To prescribe 50 caramels with eucalyptus 50 mg.

Rp.: Caramels eucalyptus 0,05 N. 50
D.S. Intra-oral. Four caramels a day.

Briquettes (Briketa)

Briquettes are the products obtained by pressing or briquetting some powders obtained from the medicinal plants. The extractive obtained solution is used internal or locally during one day or during the bath.

The briquettes are prescribed in a short form.

To prescribe briquettes with water agrimony.

Rp.: Briquettes of water agrimony grass 75, 0
D.S. One division to hold in boiling water 10 minutes, to filter and to use for the preparation of one child bath.

Example:

Eucalyptus leaves briquettes 100,0

Species (Species). Compound teas.

Species and teas represent mixtures of broken up, seldom entire medicinal plants and sometimes there can be added ether oils, salts etc. The species can be for internal and external use.

There are distinguished:

1. Species for poultices (cataplasmata); before use it is added hot water till a homogenous substance forming, that is put on the skin (in a gauze).

2. Species for dry poultices (sacculi medicati); the heated substance is put on the necessary place (in a gauze).
3. Species for infusion (tea) or decoction preparing (Species ad infusum s. decostum)
4. Smoking species (Species fumales s. cigarette) are distinguished for smoke introducing in lungs, that contains active substances of plants.

Prescription:

Rp.: Species antiasthmaticae 50, 0

D.S. Take ½ teaspoon, burn and inspire the smoke twice a day.

Here you have some species and teas used in medical practice.

Gastric tea

Raw material name		Intestine regulators		Astringent						
Latin	English	N.1	N.2	N.1	N.2	N.5[4]	N.6[4]	N.3	N.4[6]	N.7[7]
Cortex Frangulae	Buckthorn bark	30,0	20,0							
Flores Helichrysi arenarii	Helichrysum arenarium flowers							12,5		20,0
Folium Menthae piperitae	Peppermint leaf	20,0						37,5		50,0
Folium Salviae	Salvia leaf									
Folium Urticae	Nettle leaf	30,0								
Fructus Alni	Alder pinea				66,5					
Fructus Anisi vulgaris	Anise fruit		20,0							
Fructus Carvi	Caraway fruit							12,5		10,0
Fructus Myrtilli	Bilberry fruit			40,0				25,0		
Fructus Pruni Padi	Bird cherry fruit			60,0						
Herba Millefolii	Yarrow herb		10,0							
Radix Glycyrrhizae	Licorice root		30,0							
Radix Rumicis	Horse dock root						50,0			
Rhizoma Bistortae	Shakeweed rhizome				33,5	50,0	50,0		80,0	

Rhizoma Calami	Sweet flag rhizome	10,0								
Rhizoma cum radicibus Valerianae	Valerian rhizome with root	10,0								
Rhizoma Tormentillae	Cinquefoil rhizome							12,5	20,0	20,0
Rhizoma Sanguisorbae	Burnet rhizome					50,0				
Semen Sinapis nigrae	Mustard seeds		20,0							

Prepare and using ways:

1 1 spoon of mixture to scald with 1glass (200 ml) of water, to boil 10 minutes and to strain through gauze; to take ½ glass in the morning and in the evening.

2 2 teaspoons of mixture to scald with 1 glass of water, to boil 10 minutes and to strain through gauze; to take ½ glass in the morning and in the evening.

3 2 spoons of mixture to scald with 2 glasses of water, to boil 20 minutes and to strain through gauze; to take 3 times per day 1/4 - ½ glass.

4 2 teaspoons of mixture to scald with 1 glass of boiling water, after 30 minutes to strain through gauze and during the day to take 3 – 4 times.

5 2 spoons of mixture to scald with 2 glasses of water, to boil 10 minutes, to strain through gauze and 3 times per day to take ½ glass15 – 20 minutes before eating.

6 2 spoons of mixture to scald with 1 glass of boiling water, after 30 minutes to strain through gauze and during the day to take 3 – 4 times.

7 2 teaspoons of mixture to scald with 1 glass of boiling water, to strain through gauze and to take ½ glass 3 hours before eating.

Carminative tea

Raw material name						
Latin	English	N.1	N.2[2]	N.3[2]	N.4[2]	N.5[2]
Flores Chamomillae	Chamomile flowers		20,0	50,0		54,0
Folium Menthae piperitae	Peppermint leaf	40,0	20,0		25,0	
Fructus Carvi	Caraway fruit		20,0		25,0	10,0
Fructus Foeniculi	Fennel fruit	20,0	30,0		25,0	
Herba Origani vulgaris	Wild marjoram herb			50,0		
Rhizoma cum radicibus Valerianae	Valerian rhizome with root	40,0	10,0		25,0	36,0

Prepare and using ways:

[1] 2 teaspoons of mixture to scald with 1glass of boiling water, after 20 minutes to strain through gauze; to take 1 glass in the morning and in the evening.

[2] 1 teaspoon of mixture to scald with 1 glass of boiling water, after 20 minutes to strain through gauze; take ½ glass in the morning and in the evening.

Appetite tea

Raw material name						
Latin	English	N.1	N.2[1]	N.3[1]	N.4[1]	N.5[1]
Folium Menyanthidis	Marsh trefoil leaf		25,0		35,0	50,0
Folium Millefolii	Thousand-leaf	20,0				
Fructus Carvi	Caraway fruit		25,0			
Herba Absinthii	Wormwood herb	80,0	25,0	40,0	35,0	50,0
Herba Centaurii	Centaury herb				30,0	
Herba Millifolii	Thousand-leaf herb			40,0		
Radix Taraxaci	Dandelion root			20,0		
Rhizoma Calami	Sweet flag rhizome		25,0			

Prepare and using ways:

[1] 1 spoon of mixture to scald with 1glass of boiling water, after 20 minutes to strain through gauze; take 1 spoon before eating 3 - 4 times per day.

Cholagogic tea and species

Raw material name					
Latin	English	Tea N.1	Species	Tea N.2[2]	Tea N.3[3]
Folium Menthae piperitae	Peppermint leaf	20,0	17,7		18,2
Folium Menyanthidis	Marsh trefoil leaf	30,0	27,8		
Folium Menyanthidis	Marsh trefoil leaf	40,0	36,8	30,0	27,2
Fructus Coriandri	Coriander fruit	10,0	17,7		
Fructus Foeniculi	Fennel fruit				18,2
Herba Absinthii	Wormwood herb				18,2
Herba Millifolii	Thousand-leaf herb			50,0	18,2
Radix Rhei	Rhubarb root			20,0	

Prepare and using ways:

[1] 2 spoons of mixture to scald with 2 glasses of water, to boil 10 minutes and to strain through gauze and to squeeze; take ½ glass 3 times per day, 15 minutes before eating.

[2] 1 spoon of mixture to scald with 1 glass of boiling water, to strain through gauze; to take for night.

[3] 2 teaspoons of mixture to scald with 2 glasses of cold water during 8 hours; to take during the day.

Diuretic tea

Raw material name								
Latin	English	N.1	N.2[1]	N.4[2]	N.5[3]	N.6[4]	N.7[5]	N.8[6]
Folium Betulae	Birch leaf					33,3		50,0
Folium Menyanthidis	Marsh trefoil leaf				40,0			
Folium Uvae ursi	Bear berry leaf	60,0	44,5		20,0		50,0	
Flores Cyani	Knapweed flowers	20,0		30,0	10,0			
Fructus Juniperi	Juniper friut		44,5	40,0		33,3		
Fructus Petroselini	Parsley fruit				10,0			
Gemmae Betulae	Birch buds				10,0			
Herba Equiseti arvense	Scouring rush herb							50,0
Herba Herniariae	Herniary herb						50,0	
Radix Angelicae	Angelica root			30,0				
Radix Glycyrrhizae	Licorici root	20,0	11,0					
Radix Inulae	Elecampane root					10,0		
Radix Taraxaci	Dandelion root					33,3		

Prepare and using ways:

[1] 1 spoon of mixture to scald with 1glass of boiling water, after 15 minutes to strain through gauze; to take 1 spoon 3 – 4 times per day, 20 minutes before eating.

2 1 spoon of mixture to scald with 2 glasses of boiling water, after 15 minutes to strain through gauze; to take 1 spoon 3 times per day.

3 2 teaspoons of mixture to scald with 1 glass of water, to boil 10 minutes and to strain through gauze, to squeeze; to take ½ glass 3 times per day, 20 minutes before eating.

4 1 spoon of mixture to scald with 1 glass of boiling water, to strain through gauze and to take according to the doctor's indication.

5 2 spoons of mixture to scald with 1 glass of water, to boil 5 - 10 minutes, to strain through gauze, to squeeze and to drink during the day.

6 2 spoons of mixture to scald with 2 glasses of boiling water, to strain through gauze, to squeeze and drink 3 times per day.

Thoracic tea

Raw material name									
Latin	English	N.1	N.2	N.7[1]	N.3	N.4	N.5[3]	N.8[3]	N.6[4]
Flores Althaeae	Marshmallow flowers							33,3	
Flores Malvae	Mallow flowers							33,3	
Flores Verbasci	Mullein flowers						10,0	33,0	10,0
Folium Farfarae	Coltsfoot leaf	40,0	40,0	25,0			20,0		
Folium Plantaginis	Big plantain leaf		30,0						
Folium Salviae	Sage leaf				20,0				
Fructus Anisi vulgaris	Anise fruit			25,0	20,0		10,0		20,0
Fructus Foeniculi	Fennel fruit					20,0			
Herba Origani vulgaris	Wild marjoram herb	20,0							
Radix Althaeae	Marshmallow root	40,0		25,0	20,0	40,0	40,0		20,0
Radix Violae	Violet root						5,0		
Radix Glycyrrhizae	Licorici root		30,0	25,0	20,0	40,0	15,0		15,0
Turiones Pini	Pine bud				20,0				20,0

Prepare and using ways:

1 1 spoon of mixture to scald with 1glass of boiling water, after 20 minutes to strain through gauze; to take ½ glass 3 times a day after eating.

2 1 spoon of mixture to scald with 1glass of boiling water, after 20 minutes to strain through gauze and to squeeze; to take ¼ glass 4 times a day after 3 hours.

[3] 1 teaspoon of mixture to scald with 2 glasses of boiling water, after 20 minutes to strain through gauze; to take ½ glass 4 times a day, after 3 hours.

[4] 1 spoon of mixture to scald with 1 glass of boiling water, to strain through gauze and to take ½ glass 3 times a day, after eating.

Purgative tea

Raw material name							
Latin	English	N.1	N.2	N.5[1]	N.3[2]	N.4[2]	N.6[3]
Cortex Frangulae	Buckthorn bark	50,0	25,0	60,0	80,0	54,0	
Folium Menyanthidis	Marsh trefoil leaf					18,0	
Folium Millefolii	Thousand-leaf	16,0					
Folium Sennae	Senna leaf		30,0				40,0
Folium Urticae	Nettle leaf	34,0		20,0			
Flores Sambucus nigrae	Black elder flower						30,0
Fructus Anisi vulgaris	Anise fruit		10,0				10,0
Fructus Carvi	Caraway fruit					10,0	
Fructus Coriandri	Coriander fruit				10,0		
Fructus Foeniculi	Fennel fruit						10,0
Fructus Rhamni catharticae	Purging buckthorn fruit		25,0				
Herba Meliloti	Sweet clover			20,0			
Herba Millifolii	Thousand-leaf herb					18,0	
Natrio-Kalium tartaricum	Natrium - potassium tartaric						10,0
Radix Glycyr-rhizae	Licorici root		10,0		10,0		

Prepare and using ways:

[1] 1 spoon of mixture to scald with 1glass of boiling water, after 20 minutes to strain through gauze; to take for night ½ - ¾ glass

[2] 1 spoon of mixture to scald with 1glass of water, to boil 10 minutes and to strain through gauze; to take ½ glass – 1 glass for night.

[3] 1 teaspoon of mixture to scald with 1 glass of boiling water, after to take ½ glass for night.

Sudorific tea

Raw material name							
Latin	English	N.1	N.2	N.3[2]	N.5[2]	N.4[3]	N.6[4]
Cortex Salicis	Willow bark			20,0		40,0	
Flores Sambucus nigrae	Black elder flower				33,3		50,0
Flores Tiliae	Linden flower	50,0		20,0	33,3		50,0
Folium Farfarae	Coltsfoot leaf		40,0	20,0		40,0	
Folium Menthae piperitae	Peppermint leaf				33,5		
Fructus Anisi vulgaris	Anise fruit			20,0			
Fructus Rubiidaei	Raspberry fruit	50,0	40,0	20,0			
Herba Origani vulgaris	Wild marjoram herb		20,0			20,0	

Prepare and using ways:

1 2 spoons of mixture to scald with 2 glasses of water, to boil 5-10 minutes, to strain through gauze, to squeeze; to take 1 glass of hot substance.

2 1 spoon of mixture to scald with 2 glasses of water, to boil 5-10 minutes, to strain through gauze, to squeeze; to take 1 glass of hot substance as tea.

3 2 spoons of mixture to scald with 2 glasses of boiling water, after 20 minutes to strain through gauze; to take in a hot form as tea.

4 2 spoons of mixture to scald with 1 glass of water, to boil 5-10 minutes and to strain through gauze; to take in a hot form.

Species for throat gargle

Raw material name						
Latin	English	N.1	N.3[1]	N.4[1]	N.2	N.5[2]
Cortex Quercus	Oak bark	60,0		54,0		25,0
Folium Salviae	Salvia leaf					25,0
Flores Chamomillae	Chamomile flowers				60,0	
Flores Malvae	Mallow flowers					25,0
Flores Sambucus nigrae	Black elder flower					25,0
Flores Tiliae	Linden flower	40,0	40,0		40,0	
Herba Origani vulgaris	Wild marjoram herb			36,0		
Radix Althaeae	Marshmallow root			9,0		

Prepare and using ways:

1 2 spoons of mixture to scald with 1glass of boiling water, after 2-3 minutes to strain through gauze and squeeze; to gargle the throat several times per day.

2 1 spoon of mixture to scald with 1glass of boiling water, after 15-20 minutes to strain through gauze and squeeze; to cool and to gargle the throat several times a day.

Sedative tea

Raw material name						
Latin	English	N.1	N.4[1]	N.5[1]	N.2[2]	N.3[3]
Flores Chamomillae	Chamomile flower			30,0	20,0	
Folium Menthae piperitae	Peppermint leaf	33,5	30,0		20,0	
Folium Menyanthidis	Marsh trefoil leaf	33,5	40,0			
Fructus Carvi	Caraway fruit			50,0	20,0	25,0
Fructus Foeniculi	Fennel fruit				20,0	25,0
Fructus Humuli	Hops fruit	16,5				
Herba Leonuri	Motherwort herb					25,0
Rhizoma cum radicibus Valerianae	Valerian rhizome with root	16,5	30,0	20,0	20,0	25,0

Prepare and using ways:

1 2 spoons of mixture to scald with 2 glasses of boiling water, after 20 minutes to strain through gauze; to take ½ glass in the morning and at night.

2 3 teaspoons of mixture to scald with 1 glass of boiling water, after 15 minutes to strain through gauze; to take ½ glass of warm substance in the morning and in the evening (by meteorism and intestinal spasms).

3 1 spoon of mixture to scald with 1 glass of boiling water; to take (possibly with sugar) one glass in a warm form 3 times a day (by palpitations).

Vitamin tea

Raw material name							
Latin	English	N.1	N.3[2]	N.2	N.4[2]	N.5[2]	N.6[2]
Bacca Vitis viniferae	Grapes					14,4	50,0
Folium Urticae	Nettle leaf		30,0		30,0	42,8	
Fructus Ribis nigri	Black currant	50,0			10,0		
Fructus Rosae	Wild rose fruit	50,0		50,0	30,0	42,8	50,0
Fructus Sorbi	Service tree fruit		70,0	50,0			
Radix Dauci sativi	Sowing carrots root				30,0		

Prepare and using ways:

1 1 spoon of mixture to scald with 1 glass of boiling water, after 10 minutes to take 1 glass 3 times a day.

2 1 spoon of mixture to scald with 2 glasses of water, boil 10 minutes, to keep it in a cold place after 4 hours to strain through gauze; to take ½ glass 2 – 3 times a day. The mixture no. 3 can be used for jelly preparing.

Emollient specie

Raw material name					
Latin	English	N.1	N.4	N.2[2]	N.3[3]
Folium Althaeae	Marshmallow leaf		33,3		
Folium Salviae	Salvia leaf			33,3	
Flores Chamomillae	Chamomile flower	50,0	33,3		14,3
Flores Malvae	Mallow flowers			33,3	14,3
Flores Sambucus nigrae	Black elder flower			33,3	
Herba Meliloti	Sweet clover	50,0	33,3		14,3
Radix Althaeae	Marshmallow root				14,3
Semen Lini	Flax seeds				42,8

Prepare and using ways:

1 scald the mixture with boiling water, wrap up in gauze and put it on the ill place.

2 a bit of mixture to scald with 1 glass of boiling water, to cool and to gargle the throat.

3 1 spoon of mixture to scald with 1 glass of boiling water; to wrap up in gauze and to put on the ill place.

Antiasthmatic specie

Raw material name		
Latin	English	
Folium Belladonnae	Belladonna leaf	20,0
Folium Hyoscyami	Henbane leaf	10,0
Folium Stramonii	Thorn apple leaf	60,0
Natrii nitras	Natrium nitrate	10,0

Prepare and using ways:

1 ½ teaspoon to burn and to inspire the smoke twice a day.

Antihemorrhoidal tea

Raw material name		
Latin	English	
Cortex Frangulae	Buckthorn bark	20,0
Folium Sennae	Senna leaf	20,0
Fructus Coriandri	Coriander fruit	20,0
Herba Millifolii	Thousand-leaf herb	20,0
Radix Glycyrrhizae	Licorice root	20,0

Prepare and using ways:

1 1 spoon of mixture to scald with 1 glass of boiling water; after 30 to strain through gauze; to take ½ - 1 glass at night.

Aromatic specie for baths

Raw material name		
Latin	English	
Flores Chamomillae	Chamomile flower	16,6
Flores Lavandulae verae	Lavender flowers	16,6
Folium Menthae crispae	Mint leaf	16,6
Folium Rosmarinus officinalis	Rosemary leaf	16,6
Folium Thymi	Thyme leaf	16,6
Rhizoma Calami	Calamus root	16,6

Antiscrofulous tea

Raw material name		
Latin	English	
Herba Bidentis	Water agrimony herb	44,5
Herba Solani dulcamarae	Sweet-bitter Nightshade herb	11,0
Herba Violae tricoloris	Trichomatic violet herb	44,5

Prepare and using ways:
1 spoon of mixture to scald with 1 glass of boiling water; to scald and to cool; to take 1 spoon 3 times a day.

Semisolid or soft medicinal forms

The semisolid, also called soft medicinal forms are destined to the external use and to the administration in the body cavities, but in some cases to the resorptive actions. In this group are included the following medicinal forms: ointments, liniments, pastes, suppositories, and plasters.

Ointments (Unguenta)

The ointment is a medicinal form for external use that has a soft consistence. It is one of the oldest and the most spread medicinal forms in the world. There are ointments that are distinguished for the surface effect (for the skin epidermis, mucous membrane) and for deep effect (for the deeper skin stratum). For example rectal ointments are distinguished having a local effect but also a resorptive one. They consist of medicinal substances (basis substances) and excipients, also called ointment basis that soften to the body temperature.

As an ointment basis there are used certain substances, divided in following groups:

1. Hydrophobic basis:
   a) animal and vegetal greases – pork grease (Adeps suillus depuratus s. Axungia porcina depurata), beef grease (Sebum bovinum), hydrogenated greases (Adeps hydrogenata), particularly, groundnut oil (Oleum Arachidis), greasy oils (Olea pinguia), for example, sunflower-seed oil (Oleum Helianthi) and peach oil (Oleum Persicorum);
   b) greasy-like substances – lanoline (Lanolinum), beeswax (Cera), spermaceti (Cetaceum), high alcohols , for example, cetyl alcohol (Alcohol cetylicus) and stearic alcohol (Alcohol Stearylicus);
   c) hydrocarbons – vaseline (Vaselinum), paraffin (Paraffinum), vaseline oil (Oleum Vaselini), ozokerite (Ozokeritum), ceresine (Ceresinum);
   d) silicones;
2. Hydrophilic-colloidal basis – glycerogel, polyethylene oxides, phytosterin, bentonitic clays;
3. Emulsion basis.

The properties of ointment basis must correspond to the aim assignation of the ointment: to promote the medicinal means infiltration through the skin integument or, conversely, to provide their local action.

Pork grease is an excellent ointment basis, used for the preparing of ointments with resorptive action. It is easy and entirely absorbed, and doesn't irritate the skin.

Hydrogenated greases (Adeps hydrogenata) are semisynthetic products, obtained from liquid vegetal oils as a result of their saturation with hydrogen. They are easy absorbed and don't irritate the skin; in comparison with animal greases they have more insistence.

Vegetal oils are excellent absorbed. Their liquid consistence doesn't permit them to be used as an independent basis, but as additional part of ointment basis with resorptive action they are very important.

Lanolin (Lanolinum) is one of the best ointment bases: it is neuter; it is easy absorbed and well reserved. The hydrolysis comes only in case of long time keeping and salts of heavy metals presence. Lanolin in general is used for preparing of systemic effect ointments.

The substances incorporated in the ointment, form with ointment basis a certain concentration expressed in percentage. The ointment therapeutic action depends on its concentration.

At present the ointments are produced at medicinal factories or in medicinal laboratories and are delivered in tubes or in gallipots. They have the name of the active substances or commercial names.

The therapeutic efficiency of ointments depends on the medicinal substance nature, its pharmacological and pharmacokinetic properties, and on the thermodynamic activity. The most propitious biopharmaceutical properties are realized in the context of the excipients of ointment basis. Any excipient must have certain qualities:

- to not modify the physiological functions of the skin;
- to be neuter from the chemical point of view and not to interact with the prescribed medicinal substances;
- to be adhesive and easy to yield the incorporated medicinal substances (according to the necessities);
- to have a soft consistence, but not to melt under 40° C;
- to not irritate the epidermis etc.

Ointments classification

According to the excipient nature they are distinguished into:

- natural ointments
- synthetic ointments
- semi synthetic ointments

According to the action type they are distinguished into:

- of local action
- of resorptive action

According to the application place they are distinguished into:

- dermatological
- ophthalmologic
- otorhinolaryngological (applied)
- proctologic (with local or systemic action)
- urogenital (vaginal, urethral)

One of the most adequate classification method the ointments, the dispersive method, is based on physical-chemical type of the dispersed system of these medicinal forms, being constituted of medicinal substances and excipients. According to this method, the ointments are divided in homogeneous and heterogeneous.

The homogeneous ointments are characterized by the absence of the separation surface between phases; the medicinal substances are distributed here according to the solution type, being in ion-molecular or molecular dispersing statement. To this type refer the alloy-ointments, solution-ointments and the extractive ointments.

For heterogeneous ointments it is typical the existence of the separation surface between the constituents. Depending on the distribution way of the medicinal substances in the excipient, there are some types of heterogeneous ointments: suspension-ointments, emulsion-ointments and polyphasic ointments.

Nowadays the majority of simple and compound ointments are delivered by the pharmaceutical industry in ready form. Such ointments are officinal and are prescribed only in short form, without indicating their medicinal substances composition and concentration. Thus the prescription is started with the indication of the medicinal form, this means with the word Unguenti

Example of prescription

To prescribe 20, 0 officinal zincoid ointment (Unguentum Zinci). For the applying on the harmed places of the skin.

Rp.: Unguenti Zinci 20, 0

D.S. To apply on the harmed places of the skin.

On prescribing the masterly ointments following rules are observed.

When it is necessary to prescribe a simple ointment, prepared on Vaseline, it is used the short or the unfolded prescribing form. In this case in the short form, the concentration of the active substance is indicated in percents or in mass units.

In the unfolded prescription form are enumerated all ointment ingredients – active substance, ointment basis and it is indicated their quantity; the prescription is ended with the instruction M. f. Unguentum (Misce ut fiat unguentum – mix for the ointment obtaining).

Examples:

To prescribe 50, 0 ointment on vaseline, containing 1 % neomycin sulfate (Neomycini sulfas). For salving of the skin harmed places.

Short prescribing.

Rp.: Unguenti Neomycini sulfatis 1 % - 50, 0
D.S. To salve the harmed places of the skin.
Rp.: Unguenti Neomycini sulfatis 0, 5 - 50, 0
D.S. To salve the harmed places of the skin.

Unfolded prescribing.

Rp.: Neomycini sulfatis 0, 5
Vaselini ad 50, 0
M.f. unguentum
D.S. To salve the harmed places of the skin.

If the prescription doesn't indicate the ointment basis and the ointment isn't officinal, then it is prepared on the Vaseline. For eye ointments, in such cases it is used a basis, which consists of 10 parts of waterless lanolin and 90 parts of Vaseline – eye ointment type.

All compound and simple non-officinal ointments, being not prepared on Vaseline, but on other ointment basis, are prescribed only in the unfolded prescribing form. Besides, it is accepted to prescribe the simple ointments, which contain as basis substances, the activity of which isn't expressed in mass units, but in operating units.

Examples of prescription

1. To prescribe 5, 0 ointments on lanolin and Vaseline (1 : 9), containing 20 % sulfacetamide sodium (Sulfacylum-natrium). Eye ointment.

Rp.: Sulfacylum-natrii 1, 0
Lanolini 0, 4
Vaselini ad 5, 0
M.f. unguentum
D.S. Eye ointment.

2. To prescribe 50, 0 ointment, containing 10 000 UI Benzylpenicillin sodium salt (Benzylpenicillinum-natrium) in 1, 0. To apply on the harmed places of the skin.

Rp.: Benzylpenicillinum-natrium 500 000 UI
Vaselini ad 50, 0
M.f. unguentum
D.S. To apply on the harmed places of the skin

The ointments with the commercial names are prescribed only in officinal form.

Example:

Rp.: Ung. "Tridermin-neo" 15, 0
D.S. To apply on the harmed places of the harmed skin.

Pastes (Pastae)

The paste (from Latin pasta) is a variety of ointment in which the pulverulent substances occupy at least 25 %, but in most often cases 65%, not being dissolved in the ointment base and forms a suspension in it. Near the active substance they also contain neuter powders – talcum, white clay, zinc oxide, starch. The pastes manifest a protector, siccative, adsorbent and sedative effect. They are applied on the easily oozed lesions. The ointment basis can be the same as in the ointments.

The pastes can be lipid, dry and crème. The lipid (greasy) pastes are obtained by quantity increasing of greases and are more similar with the ointments that exert

a more profound action, don't dry the skin and have protective properties. They are not soluble in water and are hardly removed from the skin surface.

The dry pastes according to their action are similar with powders or agitated suspensions and exert a more superficial action and dry the skin. They are easily removed from the teguments.

That the medicinal substances from the pastes can exert a more profound action, it is necessary for them to contain lanolin.

Prescription: In this case it can be used the both prescription methods. The officinal pastes are prescribed in abbreviated method and the masterly method is used in the prescription of the paste depending on the necessary consistence.

Example of masterly prescription:

Rp.: Iodoformii 10, 0
Amyli
Zinci oxydi aa 5, 0
Vaselini ad 50, 0
M.f. pasta
D.S. Extern. To apply on the harmed parts of the skin.

Example of officinal prescription:

Rp.: Pastae Zinci-salicylatae 25, 0
D.S. To apply on the harmed parts of the skin.

Stomatologic pastes are some concentrated suspensions in which the pulverulent active substance forms the solid (dispersed) phase and the liquid phase in most cases consists from glycerine. Besides it is used Vaseline oil, camphorated oil, distilled water etc.

Rp.: Iodoformii
Zinci oxydi aa 2, 0
Glycerini q. s.
ut f. Pasta
D.S. For stomatologic use.

Liniments (Linimenta)

The liniment is a liquid or semisolid ointment, used for frictions or local application. The liniments are medicinal forms destined to external application. The majority of liniments represent homogenous mixtures with dense liquid aspect.

In most of the cases the liniments are emulsions (aloe liniment), suspensions (balsamic liniment of A.V. Vishnevski), emulsions-suspensions (synthomicyn liniment).

For obtaining of liniments it is often used oils (Helianthi, Lini, Olivarum, Ricini etc.)

The suspension liniments are small pulverulent substances (ZnO) insoluble in the dispersing system (Aqua, Glycerin, Oils). For preparing of liniments are used emulsifiers (Emulsifier N.1, Twin, Penthol, Primelose etc.)

The liniments are unmeasured medicinal forms. The masterly prescriptions are made in unfolded and abbreviated form.

Example:

Rp.: Methylii salicylatis 10, 0
Chloroformii
Olei Helianthi aa 15, 0
M.f. linimentum
D.S. To apply on the joints.

Rp.: Linim. Synthomycini 10 % 30
D.S. To apply on harmed places of the skin.

Suppositories (Suppositoria)

The suppositories are a dosed medicinal form, solid to the room temperature, fusible or soluble at body temperature.

The suppositories serve for the introduction of medicinal incorporated substances, in body cavities.

There are the following suppositories groups:

1. Rectal suppositories (Suppositoria rectalia)
2. Vaginal suppositories (Suppositoria vaginalia)
3. Rods (bacilli)

In the quality of excipient for the suppository preparation are used different greases or mixtures of greasy substances, which imitate the properties of cacao butter (butirum or oleum cacao). The suppositories can also be prepared at drugstores, but at present they are exclusively produced in the pharmaceutical industry. With the aim of medicinal substance absorption, the excipient should be melt or dissolved in rectum, the medicinal substance must spread through the excipient in the rectal watery liquid, to be dissolved in this one, and then to traverse the rectal membrane. The liberation of the medicinal substances depends on the melting or dissolving of the excipient. So the formulation of the suppositories starts with the excipient choice.

The excipients for suppositories must have the following properties:

1. in the preparing:

- the interval between the melting point and solidifying point should be not so short, for offering suppleness in make;
- the viscosity of melted mass must be enough big to avoid the rapid sedimentation of the suspended particles;
- a chemical inertness for the incompatibilities avoiding;

2. in the stocking time they:

- don't deform and don't melt at ordinary temperature;
- don't oxidize in the air and light;
- are stable of the physico-chemical point of view;
- aren't contaminable with the microorganisms;
- don't modify the external aspect;

3. by the utilization:

- are without toxicity;
- don't have an irritant character for the rectal mucous;
- don't have colorant properties;
- don't have a specific smell;
- melt or dissolve rapidly on the applied place of the organism.

Rectal suppositories are destined for the introduction of the medicinal substances in the rectum with the view of local cure of the rectal diseases or resorptive action.

The rectal suppository form can be different: chronic, cylindrical-conic or in most cases it is torpedo like. Their diameter is 10 – 15 mm, the length - 20 – 40 mm, the weight – 1, 5 – 4 g. if the doctor doesn't indicate the weight of the rectal suppository, it should be equal with 3 grams. The suppository weight for children should be indispensable indicated.

Example of officinal prescription:

Rp.: Suppositorium cum Ichthyolo 0, 2
D.t.d.N. 10
One suppository in the morning and at night.

Example of masterly prescription:

Prescribing for one suppository

Rp.: Promedoli 0, 02
Olei Cacao 3, 0
M.f. suppositorium rectale
D.t.d.N.6
S. 1 suppository in pains.

Rp.: Promedoli 0, 02
Olei Cacao q.s.
ut f. suppositorium rectale
D.t.d.N.6
S. 1 suppository in pains.

Prescribing for all suppositories

Rp.: Promedoli 0, 12
Olei Cacao 18, 0
M.f. suppositorium rectalia N. 6
D.S. 1 suppository in pains.

Rp.: Promedoli 0, 12
Olei Cacao q.s.
ut f. suppositorium rectalia N. 6
D.S. 1 suppository in pains.

Example of prescription for commercial names of suppositories.

Rp.: Suppositoria "Proctotrombin" N. 10
D.S. One suppository a day.

Vaginal suppositories and urethral suppositories have a formulation similar with the formulation of the rectal suppositories. There are some differences in the nature of the incorporated medicinal substances, as well as in the form and the used technology. These preparations are destined for the local treatment of the infection. Because of the rich sanguine and lymphatic systems that surround the uterus, as well as of the fact that the veins drain the blood directly in the general circulation; there is a danger of toxicity as a result of rapid absorption of medicinal substances.

Vaginal suppositories serve for the introduction of the medicinal substances in the vagina with the view of local cure of the vaginal diseases. In form they can be globules (spherical form), ovules (ovoid form) or can have a flat form with one sharp part. The vaginal suppository weight is 3 – 5 g.

Prescribing of the vaginal suppositories. Vaginal suppositories can be officinal or masterly prescribed.

Example of officinal prescription:

Rp.: Suppositoria "Pimafungin" N. 10
D.S. One suppository per day.

Examples of masterly prescription:

Rp.: Trichomonacidi 0, 05
Olei Cacao 4, 0
M.f. suppositorium vaginale
D.t.d. N. 10
S. Intravaginal twice a day.

Rp.: Trichomonacidi 0,5
Olei Cacao 40, 0
M.f. suppositorium vaginalia N. 10
D.S. Intravaginal twice a day.

Rods (Bacilli) serve for the introduction of medicinal substances in some natural cavities (urethra, uterine cervix) or pathological cavities (the fistula canal). In comparison with the rectal and vaginal suppositories, the rods must correspond to the dimensions (thickness and length) of the tube in which they will be introduced. That's why the rods are prescribed only at the doctor's prescription according to the measures indicated by him. The rods have a cylindrical form with one sharp end to be easily introduced in the tube. Officinal rods don't exist and their prescription is masterly.

Example:

To prescribe 6 rods with 5 cm length and 0, 5 cm thickness, containing 0, 0005 g atropine sulphate (Atropini sulfatis) in each one. To prescribe for introducing in the urination channel of one rod once a day.

Example:

Rp.: Atropini sulfatis 0, 0005
Olei Cacao q.s.
Ut fiat bacillus longitudine 5 cm
Et crassitudine 0, 5 cm
D.t.d.N. 6
S. To introduce in the urination channel one rod once a day.

Plasters (Emplastra)

Plasters are plastic medicinal forms, which at a normal temperature are softened and adhere to the epidermis. There are several types of plasters:

1) solid plasters - solid at the room temperature and soft at the body temperature.
2) liquid plasters – liquids, which form a protector coat on the skin surface after the solvent evaporation.

The bases used in plasters' preparing are the following: greases, paraffin, wax and some medicinal substances.

A plasters' prescription is made in the abbreviated form, because they are officinal forms.

Example:

Rp.: Empl. Acrichini 30, 0
D.S. To be applied on the harmed places of the skin.

Rp.: Empl. Plumbi simplicis 50, 0
D.S. To warm a little and apply on harmed places of the skin.

The transdermal therapeutic systems is a plaster form from, which the active substance penetrates the skin. The priority of this form consists in the stable concentration of the active substance in the blood for a long time and the administration snugness. These systems consist of the following parts:

a) the reservoir with the active substance in a gel or ointment form;
b) the membrane, which regulates the intensity of the active principle diffusion to the skin;
c) the adhesive layer, which catches the skin system;
d) the external protector folia, which protects the system from the external medium influences.

Example of prescription:

Rp.: Transdermal system "Diponit" N 30
D.S. To be applied on the skin of the heart aria.

Liquid medicinal forms

The liquid medicinal forms (solutions, drops, emulsions, extracts, mixtures, enemas, tinctures, decoctions etc.) are widely spread in medical practice.

In physico-chemical relation the liquid medicinal forms are dispersing systems, in which the dispersing medium is the liquid, and the dispersing phase is the substance in liquid or solid form; according to the dispersing system type there are distinguished solutions, suspen-

sions and emulsions. In these forms the medicinal substances are in a different fragmentation measure; after their internal consumption they are suddenly absorbed; and their effect is faster than the effect, for example, of the solid medicinal forms.

But liquid medicinal forms have also disadvantages, such as: the substance state of the dispersing phase contributes to different chemical processes and are more influenced by the light and air; the fermentative processes begin very soon in liquids containing different vegetal extracts, especially watery liquids, or solutions containing organic substances (sugar). Being kept for a long time the concentration of the active substances is changed and there is a possibility of solvent evaporation (ethyl alcohol, medicinal ether, and also water). That's why most of liquid medicinal forms are delivered for 3 – 4 days consumption.

Solutions (Solutiones)

The solution is a system constituted from two phases: dispersed and dispersing. The dispersed phase or the dissolved substance is the proper active principle, is the basis substance that in the pure state can be solid, liquid or gaseous. The dispersing phase is also called the solvent or the dissolvent.

According to their composition the solutions are divided in simple and compound. The simple solutions consist of one dissolved substance, but the compound solutions – of several dissolved substances. In the dispensing of medicines the compound solutions are called mixtures.

According to the utilization model the solutions are divided into:

1. Solutions for internal use;
2. Solutions for external use.

Solutions for internal use (solutiones ad usum internum) are prescribed per os or per rectum (per clysma); per os more frequently are taken either in drops (1 ml watery solution contains 20 drops) or in spoons (a spoon – 15

ml, a dessert spoon – 10 ml, a teaspoon – 5 ml). There are also used special dosing glasses.

When prescribing solutions for internal use, it is preceded from the dose of the medicinal substance, frequency of the administrations and the solution quantity for one administration.

Solutions for internal use are prescribed without doses, unfolded and abbreviated.

1. The unfolded prescription with no dose, in which all ingredients and their quantities are indicated.

Rp.: Natrii bromidi 6, 0
Aq. destil. ad 180 ml
M.D.S. Internal, one spoon 3 times a day after meals.

Calculation. The patient must take the drug during 4 days. The single dose of sodium bromide 0, 5 should be contained in one spoon, so in 4 days the patient should take 12 spoons (3 × 4), that makes 180 ml of solution (15 × 12), which will contain 6, 0 sodium bromide (0. 5 × 12). Preparing the drug the chemist will take – 6 g of substance and will add distilled water up to 180 ml.

2. Abbreviated prescribing with no dose:

Rp.: Solutionis Natrii bromidi ex 6, 0 – 180 ml.
D.S. Internal, one spoon after meals 3 times a day.

The calculation is identical with the previous one.

3. The abbreviated prescribing without dose in percentage; the first number shows the ratio between the medicinal substance and the solvent in percents, the second one – the whole solution quantity.

The solution calcium chloride for 5 days should be prescribed in such a way, so that by the administration of one spoon the patient could receive for one taking – 1, 5 g of substance. To indicate one spoon 4 times per day.

The calculation of the solution concentration in percents: 1 spoon – 15 ml – contains 1, 5 g of substance that means a solution of 10 %.

The calculation of solution quantity. The patient will take the solution – one spoon 4 times a day during 5 days, in total – 20 spoons. One spoon -15 ml, so the total solution quantity – 300 ml.

I method (officinal)

Rp.: Solutionis Calcii chloridi 10 % - 300 ml
D.S. Internal, one spoon 4 times a day, during 5 days.

II method (masterly)

Rp.: Calcii chloridi 30, 0
Aquae destillataead 300 ml
M.D.S. Internal, one spoon 4 times a day, during 5 days.

Solutions for external use (solutiones ad usum externum)

]are destined for disinfecting and antisepsis, for the harmed skin and mucous membrane cure etc.

As solvent there are used purified water, ethyl alcohol, glycerol, different grease or vegetable oils and mineral oils. The main parameter of the solutions for external use forms their concentration and the action intensity depends on it. The effective concentration of the medicinal substance is indicated in books of specialty.

There are two forms of prescriptions: masterly and officinal. In the masterly prescription are enumerated the solution compounds and their quantities. The officinal method is more spread, in this case it is indicated the active substance, solution type, its concentration, volume or the quantity. The concentration can be expressed in percents, proportions and volume-weight ratio.

Watery solutions have purified water as a solvent.

Example: To prescribe 500 ml solution 0,02% Furacilini.

1.Method

The solution concentration in percents

Rp.: Sol. Furacilini 0, 02 % - 500 ml

D.S. External. For the wounds washing.

2.Method

The concentration of the solutions in ratio. The proportion shows how many millilitres of solution are in 1g of active substance. In this case the previous solution is 0, 02 %, this means that 0, 02 g of Furacilini are in 100 ml of solution:

0, 02 g----------100 ml

1 g----------x ml

as a result

1× 100/0, 02 = 5000 ml

Rp.: Sol. Furacilini 1:5000 – 500 ml

D.S. External. For wounds washing.

3.Method

The solution concentration in the ratio mass / volume The ratio shows how many grams of substance are in the prescribed volume of the solution.

0, 02 g----------100 ml

x g----------500 ml

x = 500 × 0, 02/ 100 = 0, 1 g

Rp.: Sol.Furacilini 0.1- 500 ml

D.S. External. For wounds washing.

4.Method (masterly)

Rp.: Furacilini 0.1

Aquae destillatae ad 500 ml

M.D.S. External. For wounds washing.

By prescribing of the oil and alcoholic solutions, after the indication of the pharmaceutical form (Solutionis) and the name of the medicinal substance follows the notation oleosae (oil) or spirituosae (alcohol), and then the concentration of the solution quantity.

Example: To prescribe 100 ml 10 % Solutio oleosa of Camphora. For rubbing in the joint area.

Officinal method

Rp.: Solutionis Camphorae oleosae 10 % - 100 ml
D.S. For rubbing in the joint area.

Masterly method

Rp.: Camphorae 10, 0
Olei Vaselini ad 100 ml
M.D.S. For rubbing in the joint area.

3. To prescribe 100 ml of alcoholic solution of 5 % iodine (if the doctor doesn't indicate the ethyl alcohol concentration, then the chemist will take alcohol of 90 %)

Officinal method

Rp.: Sol. Spirituosae iodine 5 % - 100 ml
D.S. For external use.

Masterly method

Rp.: Iodine 5.0
Sol. Spirituosae ad 100ml
M.D.S. For external use.

Suspensions (Suspensiones)

The suspension is a system formed of a solid insoluble substance (dispersed phase or active substance), its small broken up parts are suspended in a liquid (the dispersing phase or the excipient). Medicinal suspensions have as excipient the purified water, vegetal oil, glycerine etc. Unlike the colloidal solutions, the suspensions contain particles with dimensions bigger that 0, 1 mcm. Depending on the particles' size, they are distinguished – thin suspensions (0,1 - 1 mcm) and rough suspensions (bigger than 1 mcm)

Suspensions are formed in the following cases:

- the medicinal prescribed substance is insoluble in the dispersing liquid;
- the quantity of the prescribed medicinal substance exceeds its solubility in the given liquid;
- as a result of interaction between the prescribed medicinal substances result in a insoluble substance;
- the soluble substance in the given liquid precipitates after the addiction of another liquid, in which the sub-

stance is insoluble (addiction of the alcoholic solutions to the watery solutions and vice versa)

There are suspensions for external and internal use.

The suspensions can be prescribed in unfolded and abbreviated form.

To prescribe 20 ml watery suspension, that contains 0, 5 % of Hydrocortisoni acetas. To agitate before using.

Officinal method

Rp.: Suspensionis Hydrocortisoni acetatis 0,5% - 20 ml
D.S. 2 drops in the eye 4 times a day
To agitate before using

Masterly method

Rp.: Hydrocortisoni acetatis 0, 1
Aquae destillatae ad 20 ml
M.f.Suspensio
D.S. 2 drops in the eye 4 times a day
To agitate before using

Example for internal suspension:

Officinal method

Rp.: Suspensionis Phenylii salicylatis 1, 5 % - 200ml
D.S. Internal, one spoon 3 times a day.
To agitate before using

Masterly method

Rp.: Phenylii salicylatis 3, 0
Aquae destillataead 200 ml
M.f.Suspensio
D.S. Internal, one spoon 3 times a day.
To agitate before using

Some external or internal suspensions prepared by pharmaceutical factories are prescribed in the abbreviated form. In these cases the concentrations of the suspensions are not indicated, except when the suspensions are delivered in different concentrations.

Example:

Rp.: Suspensionis Griseofulvini 100 ml
D.S. Internal, one spoon 3 times a day.
To agitate before using

Drops (Guttae)

Drops are solutions or suspensions administrated or measured in drops. There are drops for external and internal use.

Drops for external use (Guttae ad usum externum s. Guttae pro usu externo) are used in ophthalmology, otorhinolaryngology and stomatology and are called ophthalmic, nasal, otic, dental drops. They are installed in the nostril, in the auditory duct, in pathologic gingival tubes.

Ophthalmic drops (Guttae ophtalmici) are sterile pharmaceutical forms solutions or suspensions, used for the cure, prophylaxis and diagnosis of eye diseases. They can also be presented in the form of sterile powders that are dissolved or suspended before using in a sterile excipient. Ophthalmic drops must be sterile and stable, they must also contain preservative substances (nipagin, nipasol etc.), which are also used as adjuvants for their protection from contamination with microorganisms, and their preparing is made in aseptic conditions. Ophthalmic drops are distributed in sterile glasses or plastic containers of multidose or of one dose, administrated with an adequate dripping system. The pH of the ophthalmic drops must be 4, 5 – 9, 0

As an excipient for the eyewash it is used water for injectable preparations (Aq. pro injectionibus) or the neutralized oil of sunflower and olive etc. The ophthalmic drops are delivered in sterile vessels endowed with dripping system.

Example. To prescribe ophthalmic drops of Pilocarpine hydrochloride.

1 Method (in percents)

Rp.: Sol. Pilocarpini hydrochloridi 1 % - 10 ml
D.S. Ophthalmic drops, 2 drops 3 times a day.

2 Method (in ratio)

Rp.: Sol. Pilocarpini hydrochloridi 10 : 1000- 10 ml
D.S. Ophthalmic drops, 2 drops 3 times a day.

3 Method (ratio mass-volume)

The solution concentration in the ratio mass/volume The ratio shows how many grams of substance are in the prescribed volume of the solution.

1 g----------100 ml

x g----------10 ml

X = 1 × 10/100 = 0, 1 g

Rp.: Sol. Pilocarpini hydrochloridi 0,1 % - 10 ml
D.S. Ophthalmic drops, 2 drops 3 times a day.

4 Method (masterly)

Rp.: Pilocarpini hydrochloridi 0, 1
Aquaepro injectionibus ad 10 ml
M.D.S. Ophthalmic drops, 2 drops 3 times a day.

Ophthalmic drops, which are prepared in pharmaceutical factories are prescribed only in abbreviated form.

Example:

Rp.: Sol. Prednisolon 0, 5 % - 10 ml
D.S. Ophthalmic drops, 2 drops 3 times a day.

Nasal drops (rhinoguttae) are liquid pharmaceutical forms of suspensions, emulsions or solutions destined to be administrated on the nasal mucous membrane. Nasal drops are distinguished in:

I. for local administration:
   - *antimicrobial and antiviral:*
   - antiseptic: colloidal salts of silver 0, 5 – 2 % volatile oils of eucalyptus, camphor, thymol, menthol etc;
   - antibiotics: streptomycin 0, 5 % neomycin sulfate 0, 5 – 1 % etc;
   - *vasoconstrictives:* ephedrine hydrochloride 1 %, naphasoline hydrochloride 0, 5 %;
   - *vasodilators:* pilocarpine, papaverine;

- *anti-inflammatories:* hydrocortisone acetate, prednisalone, betametasone etc;
- *antihistaminics:* pheniramine, antasoline etc;
- *local anaesthetics:* anesthesine, lidocaine etc;
- *hydro- and liposoluble vitamins:* A, D_2, E etc;

II. transnasal administration for the systemic action:
- *cardiovascular drugs:* nitroglycerine, propranolol etc;
- *parasympatholitics:* cocaine, atropine etc;
- *biological antimicrobial agents:* interferon;
- *hormones:* insulin, testosterone, oxytocin etc.

The solvent selection is made depending on the substance solubility and the desired effect. The solvents must correspond to the following conditions:
- to be good tolerated, compatible, nonirritant for the nasal mucous;
- to assure the substance stability;
- not to have a proper pharmacological action;
- to be miscible with the nasal mucus.

The used solvents in the nasal drops producing:
- sodium chloride solution (0, 9 %)
- glucose solution (5 %)
- neutralized vegetal oils
- propylenglycol up to 10 % in the mixture with water

Otic drops (otoguttae) are liquid pharmaceutical forms in solutions, emulsions or suspensions locally used and destined to the cure of bacterial, mycotic or allergic diseases of the extern auditory apparatus and of the tympanum. They can be watery, alcoholic, glycerol or oily. The preparation ways are - dissolving, emulsifying or suspending in water or by the dissolving in vegetal oil, or other solvents

As vehicle for otic solutions are used:
- purified water (Aq. purificata);
- ethylic alcohol (Spirtus aethylicus);
- glycerol (Glycerinum);
- greasy oils (Olea pinguia, Oleum Persicorum etc)

For otic drops the prescription is the same as for ophthalmic drops.

Drops for internal use (Guttae ad usum internum s. Guttae pro usu interno) are watery solutions of some active or toxic strong substances, which are measured in drops; their dosing method must be exact. The drop dimension depends on the nature of the excipient and the diameter of the pipette. The drop mass of a liquid dripped through the pipette depends on the diameter of its orifice and on the superficial tension of this liquid. When we take a pipette with standard diameter, the drop mass is in function of superficial tension of the liquid or, in other terms in the function of intermolecular cohesion of the proposed substance. At the temperature of 20 ° the drop of purified water is detached from the standard pipette when it reaches the mass of 0, 05 g. As a result a gram of purified water contains 20 drops. The optimal number of drops internally administrated is equal to 20, that makes 1g or 1ml, but it can vary from 5 to 40 drops for each consumption.

Example. To prescribe sulphate atropine in the dose of 0, 0005 g in the form of peroral drops.

Rp.: Sulphate atropine solution 0, 05 % - 10 ml

D.S. Intern. Twenty drops three times a day.

Parenteral forms (Parenteralia)

The parenteral forms are sterile products that are administrated through injection or implantation. They are classified in:

- Injections (Injectabilia),
- Perfusions (Infundibilia),
- Parenteral powders (Pulveres parenterales).

The forms for parenteral use are prepared by a method, which ensures the sterility and avoids the contamination and pyrogenation presence avoiding the multi-

plication of microorganisms. Numerous preparations for parenteral use contain adjuvants for the most propitious pH, solubility and antisepsis insurance. These compounds don't have to modify the medicinal substance action or to produce toxic or irritating effects.

Injections – injectable preparations (injectabilia)

The injectable forms represent solutions, suspensions, injectable emulsions or powders that are dissolved before injecting a sterile and apyretic solvent. Among them there are also solid medicinal forms compressed or in ampoules, which at the moment of administration are dissolved in the respective solvent or inoculated in the organism tissues as implants.

The solutions of the medicinal substances meant for parenteral administration, with the volume of 100 ml and more – are called perfusions.

The injectable medicinal preparations are easily and integrally resorbed, have a quick action, and the resorption speed depends on the injection place.

When injectable drugs are administrated, the medicinal substances are not tolerated through the oral way or they are inactivated in the gastrointestinal tract. For example the morphine, which is administrated orally – is constipating; the salicylates, the hormones annoy the gastrointestinal tract etc.

Injectable medicinal forms are advantageous because they contain medicinal substances and pure solvents in exact quantities, assuring a rigorous dosing. They produce a rapid and sure effect in comparison with the oral administration; even in small doses – the debit of the physiologic action can be directly controlled. The use of injectable medicinal forms permits the action localization of the medicinal substances in a certain region of the body; it can also avoid the secondary effects. By watery solution use in the injections, they can be isotonised, can be brought to the pH necessary value, and appropriated to

that of the sanguine serum, with the view to make them more tolerable and having a minimized pain action. The injectable medicinal forms can be prepared in big quantities, with assured stability and conservation, sheltered from the action of the atmospheric agents and from contamination with microorganisms. Plasma substitutes tinned blood, plasma preparations etc can be also parenteraly administrated as injectable medicinal forms.

The disadvantages of the injectable medicinal forms consist in the fact, that sometimes the patients accept them with more difficult, because, as usual they are painful. When the medicinal forms are contaminated with pathogen bacteria, these bring about the organism infecting. Some injectable medicinal forms can act directly on the blood, coagulating it, and also on the nerves and sanguine vessels, harming, irritating or whipping up them. The injectable medicinal forms can also produce accidents, sometimes very severe especially when they contain impurities in the suspensions or when they are injected without attentive control.

Injectable forms can be: solutions, emulsions, sterile suspensions or sterile powders, which are dissolved or suspended in a sterile solvent before use. Injectable solutions can be watery or oily. The watery injectable solutions are prepared with injectable water (Aquaepro injectione), and the oily injectable solutions are prepared with the injectable oil (Oleum pro injectione). The injections are introduced with the help of syringe – gradated in millilitres; that's why they are measured in millilitres. Watery injectable solutions can be administrated any way: subcutaneous, intramuscularly, intravenous etc. Oily injectable solutions are mostly administrated intramuscularly. Injectable suspensions are administrated subcutaneously, intramuscularly, intra-articularly or in other ways.

For injection are used diverse medicinal forms

The way of injection	The medicinal form
subcutaneous	watery solutions
intramuscular	watery and oily solutions, also suspensions
intravenous	watery solutions

In some cases the injectable solutions or suspensions are "ex tempore" prepared. In this case the injectable medicinal forms are prescribed and delivered in ampoules or phials in dry form and are dissolved or diluted before use.

The watery solutions are introduced in different ways:

- subcutaneously,
- intramuscularly,
- intravenously,
- intra-arterially etc.

intravenously the injectable solutions are administrated as:

- bolus – fast intravenous injection during 3 – 6 min.; the injected drug quantity is determined in milligrams for substances and millilitres for solutions.
- perfusion – usually intravenous (sometimes intra-arterial or intracoronary), the injection is made at a certain speed, the dose is determined quantitatively, for example in ml/min, mcg/min, mcg/kg/min, or through the solution drop number on minute. It is very important to use special dose-syringes or systems for the perfusion of drug micro-quantities to prevent the preparation damage in the systems.
- combined (mixed, associated) – to ensure rapidly the permanent therapeutic concentration of the drug in blood – first of all it is intravenously injected in the bolus and immediately initiated the intravenous perfusion of intramuscular administration or maintaining of the same preparation at certain intervals of time.

Injectable medicinal forms must be sterile and stable. The solutions must be isotonic and without mechanic im-

purities. Watery solutions injected subcutaneously or intramuscularly must be isotonic and must have a pH closed to 7, 4. Hypotonic solutions will be isotonised. The hyper-osmotic solutions introduced in soft tissues, cause their dehydration matched with pains and can be the cause of their necrotization in the place of administration. Intravenously are introduced only isotonic and hypertonic solutions. The hypotonic provoke red cells haemolysis. The isotonization of the solutions is made with the help of sodium chloride or more simple through dissolving of the active substance in an isotonic saline solution.

The sterility of the injectable medicinal forms is made either through the sterilization or through preparing in aseptic conditions.

Masterly injectable preparations are prepared manually at factories. By prescribing in injections of these medicinal forms prepared at drugstores, it is necessary to indicate the drug sterilization. In the prescription, after the drug name it is written "Sterilisetur!" (to be sterilized!).

Rp.: Papaverini hydrochloridi 2 % 100 ml
Natrii chloridi q. s.
U.f. solutio isotonicae
Strerilisetur!
M.D.S. For injections, 2 ml intramuscular
Twice a day.

The injectable specialties are exclusively prepared in certain conditions at pharmaceutical factories and laboratories, and are delivered in ampoules, phials, syringes etc.

The ampoules are made of coloured or uncoloured neutral glass or of special polymers if they have a bigger volume (100 – 500 ml). Lyophilic powders, solutions or suspensions, which are diluted "ex tempore", are delivered in ampoules. The water used for the injectable solution preparing must be purified.

The phials, used for injectable solutions, are some closed glass containers with varied capacity and are plugged with special plastic plugs, fixed with metallic fit-

tings through the syringe needle. They must ensure the imperviousness; must stumble the penetration of contaminated agents; must permit the entering of the syringe needle without opposing resistance and without breaking up. After the needle pulling they must be hermetically closed. In phials are packed lyophilic powders, sterile injectable solutions or suspensions. The phials haven't yet Latin names, this is why they aren't specified in prescriptions.

Usually the ampoules and phials contain only one dose of a drug. Being officinal medicinal forms, the ampoules and the phials are prescribed through the abbreviated form. Prescription the solutions or suspensions in ampoules, first of all, it is indicated the medicinal form Solution, Suspension, then the kind of solution -oily, alcoholic (if it is necessary), the medicinal substance name, the solution or suspension concentration in percents and the quantity. After this comes D.t.d. N._ in ampullis, S. and the signature. On the ampoules it is written the produce, the solution concentration and volume.

Example:

Rp.: Sol. Novocaini 0, 5 % - 2 ml.
D.t.d N. 10 in ampull.
S. For dissolving
Rp.: Susp. Prednisoloni 2 % - 2 ml.
D.t.d. N. 10 in ampull.
S. Intramuscularly 2 ml a day.

Perfusions or perfusing preparations (infundibulia)

Perfusions represent injectable solutions with the content of: electrolytes, energetic substances, reconstituents etc. They are administrated intravenously in big quantities, drop by drop, with the view to complete the loosen liquids from the organism, or as parenteral alimentation or medicinal attendance. Perfusing preparations are watery solutions or sterile emulsions (oil in water or isotonic), delivered in glass containers, closed with a rubber plug or in

plastic containers of 100, 250, 500 and 1000 ml. Perfusing emulsions must present a homogeneous aspect and the diameter of the particles must not outrun 1 micron. Perfusions are administrated intravenously (sometimes intra-arterial or intracoronary) in a volume of 100 ml or bigger, with the help of perfusion device. Perfusion introducing is made drop by drop during 30 minutes up to several hours, depending on the solution volume. In comparison with the injectable preparations the perfusions create in the patient's blood a relatively constant concentration of the active substance for the entirely perfusion period. Perfusions must be isotonic, must have pH = 7, 4 and an ionic composition more close to the organism liquids, to be sterile, apyretic, to be entirely eliminated from the organism, not to hinder the organs function, to have a constant physico-chemical composition, not to be toxic, not to agglutinate the erythrocytes etc.

According to the therapeutic aim it can be distinguished the following perfusions:

- for establishing of the hydro, acido-alkaline or ionic equilibrium of the organism (acesol, lactasol, disol, trisol etc.)
- colloidal solutions plasma constitutes (dextran, gelatinol)
- with energetic and reconstitutes (hydrolysine, polyamine etc.)
- blood substitutes with disintoxicatingaction (hemodese, polydese)
- blood substitutes with the function of oxygen transporting
- blood substitutes with complex action.

Example:

Rp.: Sol. Natrii cloridi 0,9 % - 500 ml
D.t.d.n. 5
S. For perfusion.

Parenteral powders

Parenteral powders are unstable substances in a solution form. They are prepared in pharmaceutical laboratories, in aseptic conditions and through lyophilization (their solutions are evaporated in vacuum at the lowest temperatures). They are packed in ampoules and phials.

Prescription dry substance (powders, lyophilic substances) in ampoules it is indicated the substance name and its quantity in an ampoule. Then comes D.t.d. N.- in ampullis, S. – signature. The signature indicates the substance dissolving (dilution) order, the administration way of the solution (suspension), the injection time.

Example:

Rp.: Cefazolini 1, 0
D.t.d. N. 10 in ampull.
S. The phial content to be dissolved in 5 ml. isotonic solution, for intramuscular use.

Extractive solutions

There are a lot of medicinal substances (alkaloids, glycosides, tannic substances, organic acids etc.) in the plants' composition and also some consorting and "ballasting" substances: sugar, saponins, pectin and protein substances etc. they decrease or increase, the physiological action of the medicinal substances. Sometimes they lead to dissolving of the active substances (saponins), but sometimes they have action – annoy the mucous membrane.

The extractive solutions are liquid pharmaceutical forms that are obtained through the extraction of medicinal plants or, more seldom, through the extraction of animal products with the aid of different solvents, such as purified water, ethylic alcohol and vegetal oil.

They are divided in:

a) watery extractive solutions;
b) alcohol extractive solutions;
c) oily extractive solutions.

Watery extractive solutions are prepared from vegetal drugs dissolving compounds contained in it, in most often cases at boiling temperature. According to the preparing way (infusing, decocting, mucilaging) the watery extractive solutions are divided in: infusions, decoctions and mucilage.

Infusions (Infusa) and decoctions (Decocta)

The infusion and the decoction are watery solutions extracted from vegetal material or from watery extractive solutions.

The advantage of these forms is the fact that they replace the powders from dry plants.

The disadvantage of these solutions is the fact that they cannot be kept for a long time (3 – 4 days), and the lack of dosage precision.

Infusions and decoctions are prepared according to prescribing, but if the concentration in the prescription isn't indicated, then they are prepared in the following proportions: 10 parts of the medicinal plant to 100 parts of solvent for weak substances and 1 part to 400 parts for high active substances (folium Digitalis, herba Termopsides), and 1 to 30 parts (herba Adonis vernalis, herba Convallariae majalis, radix et rhisoma Valerianae, Secale cornutum, radix Poligalae).

The preparation way

1) **The infusion**. The necessary quantity of water at the medium temperature is added to the broken up drug it and is warmed for 15 minutes on the water bath, then it is left for 45 minutes for cooling, this time it's necessary for passing of the active principles from plants into water. After that, the infusion is strained, the remained drug is squeezed, filtered and the volume of the infusion is completed with purified water. Usually the infusions are prepared from the thin (fine) parts of the plant (flowers, leaves) and biological active compounds are more easily extracted.

The prescription of infusions.

Example. To prescribe 150 ml of infusion of chamomile leaves in the dose of 0, 05g.

Rp.: Chamomile leaves infusion ex 0, 5 – 150 ml.
D.S. Internal. One spoon three times a day.

10 doses of vegetal drug were taken (0, 05 × 10 = 0, 5) and 10 spoons of water (15 ml × 10 = 150 ml).

In the case when the doctor doesn't prescribe the plant's dose:

Rp.: Termopsidis herba infusion – 100 ml.
D.S. Internal. One spoon three times a day.

Calculation: 1 g _____ 400 ml.
x g _____ 100 ml.

As a result it will be taken 0, 25 g of herba Termopsidis

2) **The decoctions** are prepared through the decoction. In comparison with the infusion the decoction stipulates the boiling of the vegetal drug for 30 minutes, then it is cooled for 10 minutes and filtered. In some cases the decoction is hot filtered. Decoctions are prepared from the rough parts of the plants (roots, rhizomes, barks) and sometimes from leaves.

The decoctions are prescribed in the same manner as infusions.

Mucilages (Mucilagine)

Mucilages are obtained by dissolving of the mucilaginous vegetal substances. The extractive solution obtained without warming is called maceration. The mucilage is obtained from the starch of its preparation with hot water. The extraction of mucilaginous substances from plants is coolly made, maintaining the broken up produce in the necessary quantity of water for 30 minutes at the room temperature, then it is decanted and filtered.

The mucilage are viscous or sticky watery colloidal solutions of some macromolecular substances such as starch, pectin etc and are used for the preparation of other medicinal forms (mixture, clysters) for neutralization of the irate action of the active substance over the mucous membrane of the digestive tract. For mixtures it is added 10 % – 30 % mucilage, for clysters up to 50 % of the entire volume. The mucilage action is explained through the molecule absorption of the active principle and through the covering of the mucous membrane with a protector stratum.

Example.

Rp.: Chlorali hydrati 3, 0
Mucil. Amyli 20, 0
Aq. destill.ad 90 ml
M.D.S. One spoon three times per day.

Rp.: Chlorali hydrati 2, 0
Mucil. Amyli
Aq. destill.aa 45 ml
M.D.S. For clyster.

Tinctures (Tincturae)

Tinctures are liquid pharmaceutical forms, under alcoholic, hydro-alcoholic and ether-alcoholic solution forms, obtained through the extraction of the vegetal products.

Usually the tinctures are obtained with the help of the alcohol of 70 % (in some cases 40 %) from a drying and broken up drug, but some tinctures are prepared from the fresh-collected plants with the aim of extraction efficiency increasing and ethanol saving (Tinctura Convallariae recens, Tinctura Valerianae recens).

The tinctures are for internal use, administrated in drops and measured in millilitres.

In comparison with the infusions and decoctions the tincture is a more stable medicinal form.

By prescribing of tinctures in the prescription it is not indicated the plant part from which it is prepared, neither the tincture concentration. The prescription begins with the medicinal form name – The tincture, and then follows the plant name and it is indicated the tincture quantity. Tinctures are measured in drops – from 5 to 30 drops for one consumption depending on the tincture action power. According to this, the total quantity of the prescribed tincture consists of 5 – 30 ml.

Tinctures are prepared in proportion of 1 : 5 (for weak active medicinal substances) or 1 : 10 (for high active medicinal substances).

It is considered that in 1 ml:

Tinctura Absithii	contains 51 drops
Tinctura Belladonnae	44 drops
Tinctura Convallariae	50 drops
Tinctura Leonuri	51 drops
Tinctura Menthae piperitae	52 drops
Tinctura Opii benzoica	49 drops
Tinctura Opii simplex	43 drops
Tinctura Strophanthi	49 drops
Tinctura Strychni	50 drops
Tinctura Valerianae	48 drops

The tinctures are officinal, unmeasured, usually in small quantities (5,0 – 30, 0) prescribed, enough for a taking term of 10 days – 20 – 40 – 60 consumptions. They are measured in drops. In the case of ether tinctures in the prescription it is written "aethereae" after the substance name.

Example:

Rp.: Tincturae Valeriane 30, 0
D.S. 30 drops three times per day.

Rp.: Tincturae Strophanthi 5, 0
Tincturae Valerianae 10, 0
M.D.S. 15 drops three times per day.

Calculation: The tincture should be prescribed for 40 consumptions, and in this case it will be 7 drops × 40 consumptions = 280 drops. Taking into account that 1 g of tincture contains 50 drops, in general it will form approximately 6, 0 (280 drops: 50 drops = 5, 6)

Extracts (Extracta)

Extracts are some concentrated extractive solutions obtained through the concentration up to a certain grade, from a vegetal or animal raw material.

Depending on the concentration, there are fluid, soft and drying extracts. Fluid extracts (nomin. sing. – Extractum fluidum; genitiv. sing. – Extracti fluidi) represent coloured liquids; soft extracts (nomin. sing. – Extractum spissum; genetiv. sing. – Extracti spissi) are viscous masses with water content under 25 %; drying extracts (nomin. sing. - Extractum siccum; genetiv. sing. – Extracti sicci) have a powdery mass aspect, with the highest humidity of 5 %.

The extraction is made with the help of: water, ethylic alcohol (different concentrations), propylenglycol etc. depending on the extragent they are distinguish in: Extracta aquasa, Extracta spirituosa, Extracta aepherea etc.

Preparing methods: maceration, percolation, repercolation etc.

All extracts are officinal and are prepared on industrial way. That's why the extract prescription doesn't indicate the character of the raw material and the extract concentration.

Fluidextracts differ from tinctures only by other preparation proportion, and namely 1:1. The active principle concentration from the fluidextract coincides with the concentration of the vegetal drug. Fluidextracts are administrated in drops, but in certain cases the dose is one spoon.

From fluidextracts through evaporation at pharmaceutical factories are prepared drying and soft extracts. They

are more concentrated and are prescribed in: capsules, powder, tablets, suppositories and pills.

The soft extracts contain up to 25 % water. They represent a dense viscous mass. The medicine often contains:

- soft extract of belladona (Atropa belladonna), rectal suppositories;
- soft extract of Valerian in dragee tablets of 0, 02 g as sedative remedy etc.

The drying extracts contain only 3 - 5 % water and have a solid consistence, being easily powdered. They are prescribed under diverse medicinal forms: powders, tablets, pills, rectal and vaginal suppositories.

Examples of extracts:

Rp.: Extracti Frangulae fluidi 30, 0
D.S. 30 drops twice a day.

Rp.: Extracti Valeriani 0, 05
D.t.d. N. 50 in tabl.
S. Internal. One tablet three times a day.

Syrups (Sirupi)

Syrups are dense, transparent, sweet liquids for internal use, depending on composition they have different taste and smell. The simple syrup is prepared dissolving by boiling the refined sugar in water. The sugar concentration must be 64 %, because in less concentrated solutions the microflora is developed in more concentrated syrups the sugar fall in sediment.

The medicinal syrup is a liquid medicinal form, for internal use, which represents a solution of medicinal substance in the concentrated sugar solution. They are destined to internal administration and are used for the masking the unpleasant taste of the active principles mainly in paediatrics.

All syrups are officinal. By their prescribing it is necessary to show only the name and all quantity in grams. The syrups are added to the mixtures in a quantity of 5 – 20 % from the entire volume.

Rp.: Coffeini – natrii benzoatis 1, 4
Sir. Simpl. 24, 0
Aq. destill. Ad 120 ml
M.D.S. One teaspoon three times a day.

Aromatic waters (Aquae aromaticae)

Aromatic waters are obtained from vegetal raw material containing ether oils. They are obtained either through stimulating of the aromatic substances from the vegetal material with water vapors, or through the dissolving of the essential oils in water. The molecules of the aromatic substances pass in water giving flavour. Aromatic waters are:

- AquaeAmigdalarum
- AquaeFoeniculi
- AquaeMenthae piperitae
- AquaeRosae

In the prescription it is shown the name and the entire quantity in millilitres. Aromatic waters are unstable. They are used in mixtures as corrigens and constituents.

Example:

Rp.: Natrii bromidi 4, 0
Aq. Rosae ad 150 ml
M.D.S. One teaspoon a day.

Emulsions (Emulsa)

The emulsion is a liquid medicinal form, which represents a dispersed system, consisting of insoluble liquids that form two immiscible phases. The emulsions are heterogeneous systems, in which one of these phases, being like small particles (dispersed phase), are uniformly distributed in the other one (dispersant phase). According to the external aspect the emulsions are very alike with the milk. Depending on the dispersed phase two types of emulsions are used: oil in water (O/W) and water in oil (W/O).

The emulsion advantage consists in the masking of the substance unpleasant taste and decrease annoying action of the medicinal substances.

The disadvantages: the emulsion is unstable, it is prescribed for a 5 days term and they are made ex tempore.

According to the way of administration the emulsions are classified in:

- for internal use (are exclusively O/W);
- for external use;
- parenteral use.

The emulsions are prepared from seeds (emulsa ex seminibus) and oils (emulsa ex oleis).

The seminal emulsions are prepared from seeds of some plants, such as sweet tonsils (Amigdali dulcis), poppy (semen Papaveris), pumpkin (semen Cucurbitae) etc. These seeds contain oils and mucilaginous substances of protein origin, having emulsifier properties. That's why at the seminal emulsion preparation there are not added specific emulsifiers. The peeled seeds are triturated in water for obtaining of a liquid like milk. The seminal emulsion concentration (the ratio between the seed quantity and the total quantity of the emulsion) 1:10. This means that for one part of seeds are taken 10 parts of water and as a result from 1g of seeds are obtained 10 ml of emulsion. The obtained emulsion is filtered through double lint, the residue is thrown and the milky liquid is used as vehicle for some medicinal substances for masking the unpleasant taste. In the case of pumpkin seeds (semen Cucurbitae) the residue is not separated from the emulsion because it contains the active principle (antihelmintic). The emulsion from the pumpkin seeds, separated from the residue, is recommended by some beautician for the skin care, that renders its freshness.

The prescription. To prescribe 150 ml seminal emulsion from pumpkin seeds. To administrate one spoon three times a day.

I method (masterly)

Rp.: Semen Cucurbitae 15, 0
Purified water 150 ml
M.f.emulsum
D.S. Intern. One spoon three times a day.

II method (officinal)

Rp.: Semen Cucurbitae emulsion 150 ml
D.S. One spoon three times a day.

The oily emulsion is prepared from liquid oils: castor-oil (Oleum Ricini), almond oil (Oleum Amygdalarum), peach oil (Oleum Persicorum) etc.

As emulsifier it is used:

Penthol
Polysorbat
Apricot gum (Gummi Armeniacae vulgaris)
Tragacante gum (gummi tragacanthae)
Starch (Amylum)
Methylcellulose (Metylcelulosa) etc.

For emulsifying 2 parts of oil are taken, one part of emulsifier and 17 parts of water. If the oil quantity in the prescription is not indicated then from 10, 0 oil are usually obtained 100 ml of emulsion.

To extract 200 ml emulsion are taken 20 ml oil, 10 g gelatos and 170 ml water.

The preparing. The oil is mixed with the emulsifier and some water until a liquid like cream is obtained. After that water is added until the due mass and the obtained emulsion is filtered through double lint. The oily emulsions are prescribed in two methods: masterly and officinal. In the masterly method it is indicated: the oil, the emulsifier and water with their respective quantities. After that follows M.f.emulsum (Misce ut fiat emulsum – Mix to obtain the emulsion), which indicates the specific process of the emulsion preparation. Then the indication D.S follows.

Example: To prescribe oily emulsion from 10 g castor oil.

I method (masterly)

Rp.: Olei Amygdalarum 20, 0
Gelatosae 10, 0
Aq. destill. 170 ml
M.f.emulsum
D.S. To take in spoons during 30 minutes.

In the officinal method - after the medicinal form name follows the name of the oil, its quantity and through dash (-) the total quantity of the emulsion.

II method (officinal)

Rp.: Emulsi ol. Amygdalarum 200 ml
D.S. To take in spoons during 30 minutes.

If the ingredient ratios of the emulsions are standard (2:1:17) then its concentration may be not indicated (it is indicated only the quantity of the emulsion):

XI. AEROSOLS (AEROSOLA)

Aerosols are heterogeneous dispersed systems, in which the dispersing medium is the air, a gas or a mixture of gases, and the dispersed phase consisting of microscopic particles of the medicinal substances in the solid state, that is extremely thin pulverized or in the liquid statement. According to the administration way and therapeutic aim, there are aerosols for inhalation (Salbutamol, Berotec) and aerosols for external use, which are applied on the skin and on the mucous membranes. Aerosols for external use are in the form of solutions, liniments, foam etc (Olasol, Levovenisol, Propasol etc.).

Aerosols with the dispersed particle dimension of 0, 5 – 10 microns are used for inhalation. Particles bigger than 10 microns remain on the nasal mucous membrane. The sprays are delivered under commercial names. First of all these are medicinal aerosols to cure the respiratory diseases (bronchial asthma, bronchitis).

Aerosols are advantageous because of comfortable utilization, rapid action and dosage precision.

Example: Aerosolum "Berotek" N. 1
D.S. Three inhalations a day

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