

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**  
**UZHHOROD NATIONAL UNIVERSITY**  
**FACULTY OF MEDICINE**  
**DEPARTMENT OF BIOCHEMISTRY AND PHARMACOLOGY**

# **MEDICAL PRESCRIPTION**

**METHODICAL INSTRUCTIONS FOR MEDICAL STUDENTS**

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**Упорядники:**

- асистент кафедри біохімії та фармакології медичного факультету ДВНЗ «УжНУ»

**Никифорок Андрій Ярославович, Ph.D.**

- асистент кафедри біохімії та фармакології медичного факультету ДВНЗ «УжНУ»

**Петах Павло Владиславович**

Методичний посібник для студентів складено у відповідності з вимогами освітньо-професійної програми підготовки магістра.

**РЕЦЕНЗЕНТИ:**

**Сірчак Є.С.** – д.мед.н., професор, завідувач кафедри пропедевтики внутрішніх хвороб медичного факультету ДВНЗ «УжНУ»

**Сятиня В.А.** – к.фарм.н., доцент кафедри фармацевтичних дисциплін медичного факультету ДВНЗ «УжНУ»

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## **PREFACE**

The following methodical instructions are intended for English-speaking students of medical academic institutions of Ukraine studying the discipline "Pharmacology". These methodical instructions complement existing English-language pharmacology textbooks published in this country.

Given methodical instructions contain the basic principles of medical prescription and the rules regulating the writing of medical prescription in various dosage forms. In order to facilitate the learning of foreign students, the guidelines also include examples and recommendations for appropriate prescription writing.

## **RATIONAL PRESCRIBING**

Rational prescribing is not just the choice of a correct drug for a disease, or mere matching of drugs with diseases, but also the appropriateness of the whole therapeutic set up along with follow up of the outcome. **The criteria to evaluate rational prescribing are:**

- **Appropriate indication:** the reason to prescribe the medicine is based on sound medical considerations.
- **Appropriate drug** in efficacy, tolerability, safety, and suitability for the patient.
- **Appropriate dose, route and duration** according to specific features of the patient.
- **Appropriate patient:** no contraindications exist; drug acceptable to the patient; likelihood of adverse effect is minimal and less than the expected benefit.
- **Correct dispensing** with appropriate information/ instruction to the patient.
- **Adequate monitoring** of patient's adherence to medication, as well as of anticipated beneficial and untoward effects of the medication.

There is no doubt that knowledge of the prescriber about drugs and disease is the most important determinant of his/her prescribing pattern, but it has been demonstrated time and again that simply improving knowledge has failed to promote rational drug use.

### **Factors influence rational prescribing:**

- **Knowledge of the prescriber.**
- **Role models:** one tends to follow prescribing practices of one's teachers or senior/popular physicians.
- **Patient load:** heavy load tends to foster routinized symptom-based prescribing.
- **Attitude to afford prompt symptomatic relief** at all cost.
- **Imprecise diagnosis:** medication is given to cover all possible causes of the illness.
- **Drug promotion and unrealistic claims** by manufacturers.
- **Unethical inducements** (gifts, dinner parties, conference delegation, etc.).

- Patient's demands: many patients are not satisfied unless medication is prescribed; misconceptions, unrealistic expectations, 'pill for every ill' belief.

### **Process of rational prescribing:**

- Establish a diagnosis (at least provisional).
- Define therapeutic problem(s), e.g., pain, infection, etc.
- Define therapeutic goals to be achieved, e.g., symptom relief, cure, prevention of complications, etc.
- Select the class of drug capable of achieving each goal.
- Identify the drug based on efficacy, safety for the particular patient, suitability, cost.
- Decide the route, dose, duration of treatment, considering patient's condition.
- Provide proper information and instructions about the medication.
- Monitor adherence to the medication (compliance).
- Monitor the extent to which therapeutic goal is achieved, e.g. BP lowering, peptic ulcer healing, etc.
- Modify therapy if needed.
- Monitor any adverse drug events that occur, and modify therapy if needed.

## **IRRATIONALITIES IN PRESCRIBING**

It is helpful to know the commonly encountered irrationalities in prescribing so that a conscious effort is made to avoid them:

- Use of drug when none is needed; e.g., antibiotics for viral fevers and nonspecific diarrhoeas.
- Compulsive coprescription of vitamins/tonics.
- Use of drugs not related to the diagnosis, e.g., chloroquine/ciprofloxacin for any fever, proton pump inhibitors for any abdominal symptom.
- Selection of wrong drug, e.g., tetracycline/ ciprofloxacin for pharyngitis,  $\beta$  blocker as antihypertensive for asthmatic patient.

- Prescribing ineffective/doubtful efficacy drugs, e.g., serratiopeptidase for injuries/ swellings, antioxidants, cough mixtures, memory enhancers, etc.
- Incorrect route of administration: injection when the drug can be given orally.
- Incorrect dose: either underdosing or overdosing; especially occurs in children.
- Incorrect duration of treatment, e.g., prolonged postsurgical use of antibiotics or stoppage of antibiotics as soon as relief is obtained, such as in tuberculosis.
- Unnecessary use of drug combinations, e.g., ciprofloxacin + tinidazole for diarrhoea, ampicillin + cloxacillin for staphylococcal infection, ibuprofen + paracetamol as analgesic.
- Unnecessary use of expensive medicines when cheaper drugs are equally effective; craze for latest drugs, e.g., routine use of newer antibiotics.
- Unsafe use of drugs, e.g., corticosteroids for fever, anabolic steroids in children, use of single antitubercular drug.
- Polypharmacy without regard to drug interactions: each prescription on an average has 3–4 drugs, some may have as many as 10–12 drugs, of which many are combinations.

Irrational prescribing has a number of adverse consequences for the patient as well as the community.

Rational prescribing is a stepwise process of scientifically analyzing the therapeutic set up based on relevant inputs about the patient as well as the drug, and then taking appropriate decisions. It does not end with handing over the prescription to the patient, but extends to subsequent monitoring, periodic evaluations and modifications as and when needed, till the therapeutic goals are achieved.

## **INFORMATION/INSTRUCTIONS TO THE PATIENT**

Rational prescribing also includes giving relevant and adequate information to the patient about the drug(s) and disease, as well as necessary instructions to be followed:

*Effects of the drug:* Which symptoms will disappear and when (e.g., antidepressant will take weeks to provide an effect); whether disease will be cured or not (e.g., diabetes, parkinsonism can only be ameliorated, but not cured), what happens if the drug is not taken as advised (e.g., tuberculosis will worsen and may prove fatal).

*Side effects:* There is considerable debate as to how much the patient should be told about the side effects. Detailed descriptions may have a suggestive effect or may scare the patient and dissuade him from taking the drug, while not informing tantamounts to negligence, and the side effect, when it occurs, may upset the uninformed patient. Communicating the common side effects without discouraging the patient is a skill to be developed.

*Instructions:* How and when to take the drug (special dosage forms like inhalers, transdermal patches, etc. may need demonstration); how long to take the drug; when to come back to the doctor; instructions about diet and exercise if needed; what laboratory tests are needed, e.g., prothrombin time with oral anticoagulants, leucocyte count with anticancer drugs.

*Precautions/warnings:* What precautions to take; what not to do, e.g., driving (with conventional antihistaminics) or drinking (with metronidazole), or standing still (after sublingual glyceryl trinitrate); risk of allergy or any serious reaction, etc.

In the end it should be ensured that the instructions have been properly understood by the patient. Rational prescribing, thus, is a comprehensive process.

## **BASICS OF THE MEDICAL PRESCRIPTION**

**Medical prescription** – is a section of Pharmacology about medical agents (drugs) devoted to the rules of prescription and preparation of medicinal (drug) forms.

**Medical agents (substances)** – these are substances or their mixtures of natural, synthetic or biotechnological origin, which are applied for prophylaxis, diagnosis and treatment of the human diseases or for changing the status and the functions of the organism.

*There are such types of medical agents:*

- a) active substances;
- b) ready-made medical agents (medicines, medical preparations, drugs);
- c) agents used for revealing pathogens – illnesses agents and also for fight for pathogenic organisms and parasites;
- d) medical cosmetics and medical food additives.

Ready-made medical agents (medicines, medical preparations, drugs) – these are dosed medical agents in the form, which they are applied in.

According to the technological process of preparation of the drug (dosage) form, substances are divided into 2 groups:

**1. Active agents** (substances) – biologically active substances, mighty to change the organism status and functions or can have preventive, diagnostic or curative action and are used for manufacturing the ready-made medicines.

**2. Auxiliary substances** are the additional substances necessary for preparation of the ready-made medicines.

In the drugstore all medical agents (medicines, drugs) are divided into three groups:

**1. Poisonous (venena, List A).**

Poisonous and narcotic substances belong to them. They are kept locked in cases in specially equipped rooms. The severe registration is conducted. At the end of the working day the case, where they are kept, is sealed up.

**2. Strong-acting (Heroica, List B).**

These drugs are also kept separately from other medical agents in the cases with inscription "B". After working day this case is closed by a key.

**3. Other medical agents.**

These are drugs that are stored in the pharmacy in accordance with the requirements (orders) of the State Pharmacopoeia of Ukraine.

**State Pharmacopoeia of Ukraine** is the legal act, that includes the general demands for medical agents, pharmacopoeia articles and also methods of medicines quality control (physical-chemical, chemical and biological methods).

**Pharmacopoeia Farticle** is normative-technological document, which determines the demands for medical agents, their packing, conditions and terms of their storage, the methods of their quality control.

The set of properties that meets the requirements established by law, and gives medical agents the opportunity to satisfy consumers in accordance with their purpose, is called quantity.

Pharmacopoeia also contains the inquiry tables, the tables of maximum single and daily doses poisonous and strong-acting medical agents for adults and children.

Medicines, components, doses and methods of their preparation directed in pharmacopoeia are named **officinal** (from Latin officina - laboratory, workshop), and pharmaceutical forms, which are prepared in drugstore after doctor's prescription are called **magisterial**.

**Pharmacy, drugstore** - an establishment for storage, preparation and selling of medicines, storage and selling of curative mineral waters, dressing, the patient care items, sanitation products, personal hygiene items and so on.

## **STRUCTURE OF PRESCRIPTION AND MAIN RULES OF PRESCRIBING**

Prescription – is the written direction (request) from a doctor to a pharmacist about the preparation and selling (handing over) medicine (drugs) to the patient with the indication of its use.

Prescription is an important medical, juridical and financial document. The prescription should be written after the patient's examination. The structure of the prescription is displayed in table 1.

Table 1 – The structure of a prescription (in latin)

|                   |  |
|-------------------|--|
| <b>Inscriptio</b> | Contains a name of medical establishment and a stamp of the establishment. |
| <b>Datum</b>      | The date of making a prescription.   |

|   |   |
|---|---|
| <b>Nomen aegroti</b>                      | Surname and initials of the patient with the indicating of the age.   |
| <b>Nomen medici</b>                       | Surname and initials of the doctor (legibly).   |
| <b>Invocatio</b>                          | This part of the prescription begins with the Latin word Recipe (Rp.: in reduced form), that means - take. After Rp.: substances necessary for preparation of the medicine are accounted.   |
| <b>Designatio materialium</b>             | All the names of the substances are written in Latin in the Genitive Case, each with a capital letter and from a new line. After the medicine's name, its quantity (dose) is indicated. The doctor has to use the metric system of weight and measures (grams, milliliters or action units).  |
| <b>Subscriptio</b>                        | It is the directive to the drugstore about the quantity of doses and the manner of preparation of the drugs. From a new line it is written "Misce (mix), fiat (make) pulvis (powder), or suppositorium, or unguentum (ointment), and so on. Here the following words can be used: Da (give), tales (such) doses (doses), and also the letter N (number) after which the quantity of the doses is marked, for example: N3. |
| <b>Signatura</b>                          | From a new line, the Signa is written (a reduced form - S:). This prescription part is appointed for the patient. That is why it is written in the state language, without any reductions. It describes the way of the use of the prescribed medicine. For example: "1 tea spoon 3 times a day", or "1 tablet when there is a headache".  |
| <b>Nomen medici et sigillum personale</b> | Doctor's signature and his personal seal (stamp).   |



**Medicinal (drug) form** is the distinctive size, shape and external appearance of medicinal substance convenient for use. Medicinal form has a great significance for medicinal activity which depends on its biological accessibility.

The classification of medicinal (drug) forms used in clinical practice:

1. *Non-liquid (solid) medicinal forms.*
2. *Soft (slim) medicinal forms.*
3. *Liquid medicinal forms.*
4. *Gasiforms.*
5. *Medicinal forms for injections.*

The detailed description of medicinal (drug) forms is displayed in table 2.

Table 2 – Classification of medicinal forms (general classification)

| Firm (solid)   | Soft   | Liquid   | Gasiform                | Forms for injections  |
|--|--|--|-------------------------|---|
| Powder<br>Capsules<br>Species<br>Tablets<br>Dragee<br>Granules<br>Caramel<br>Pastilles<br>Films (inserts)<br>Sponges<br>Extracts dry<br>Plasters | Ointments<br>Pastes<br>Liniments<br>Transdermal system<br>Creams<br>Gels<br>Extracts dense<br>Lotions<br>Shampoos<br>Suppositories | Solutions<br>Enemas (rectal injections)<br>Tinctures<br>Extracts liquid<br>New galen's preparations<br>Infusions<br>Decoctions<br>Emulsions<br>Balsams<br>Mixtures | Aerosols<br>Inhalations | Ampoules<br>Bottles<br>Sterile solutions<br>Suspensions<br>Emulsions<br>Powders |

Medicinal (drug) forms are also divided into dosed and non-dosed forms. Drugs which are prescribed with the indication of a single dose and are called dosed medicinal forms. Drugs which are prescribed with the total amount (dose) of the drug and are dosed by patient are called non-dosed medicinal (drug) forms. The detailed description of dosed and non-dosed medicinal (drug) forms is displayed in fig. 2.

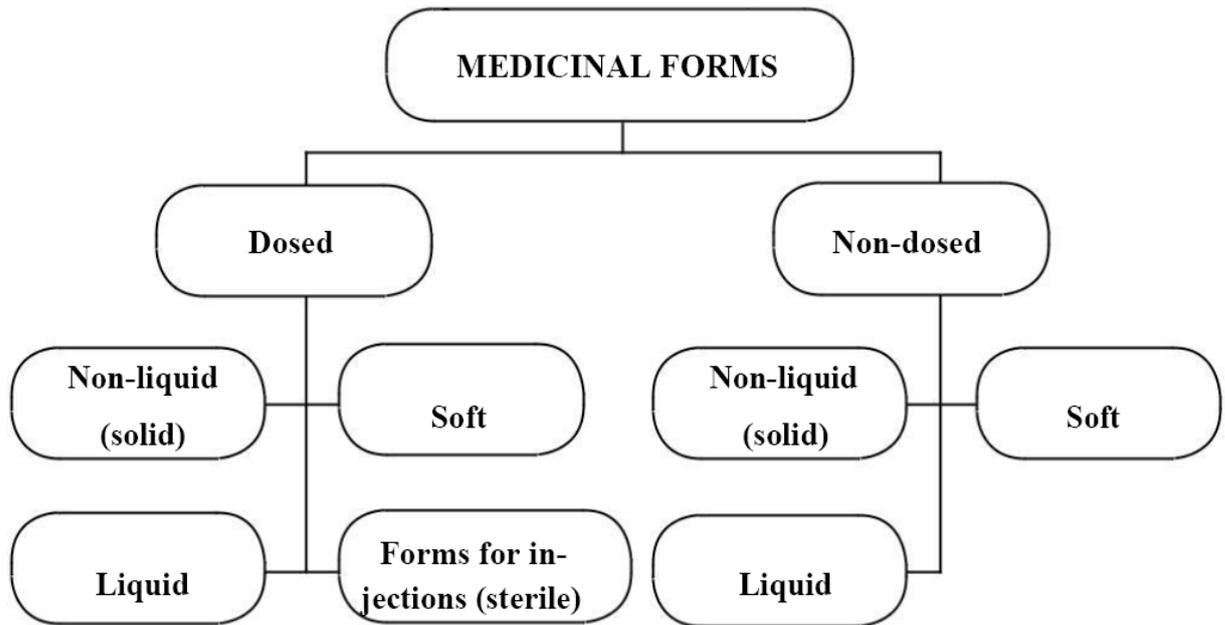


Fig. 2 – Classification of medicinal forms (dosed and non-dosed)

## DOSED DRUG FORMS

### 1. NON-LIQUID (SOLID) DOSED DRUG FORMS

Non-liquid (solid) dosed drug forms are:

- dosed powders;
- capsules;
- dragee;
- tablets;
- others: caramels, pencils, lozenges etc.

The examples of some solid dosed drug forms are displayed in fig. 3.

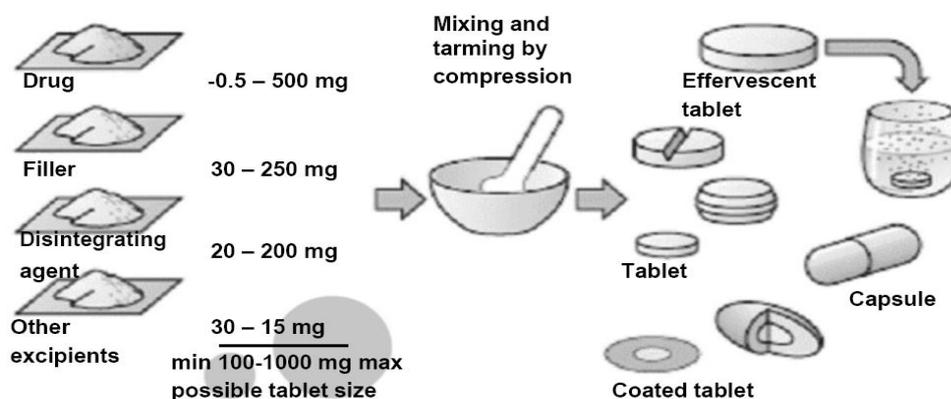


Fig. 3 – Examples of some non-liquid (solid) dosed drug forms

**The positive qualities of solid dosed drug forms are:** stability, the convenience of preservation and delivery, the exactness of dosage, protection from the action of destroying enzymes of stomach for some forms. For dragee, it is an opportunity of incompatible medicinal substances' combinations.

**The disadvantages of solid dosed drug forms are:** slow action, the impossibility to prescribe to little children, to patients in faint state, etc.

## DOSED POWDERS

**Dosed powders** are non-liquid (solid) medicinal (drug) forms with the exact dosage of the medicine in one intake. The mass of dosed powders is minimum – 0.1 g, maximum – 1.0 g, average – 0.3-0.5 g.

Classification of dosed powders:

- 1) **simple powders** which contain only one substance;
- 2) **complex powders** which have two and more ingredients.

To prescribe a simple powder with the mass of **more than 0,1** are written the name of drug in Latin (in genitive case), the dose, then in the next line the sentence “*Da tales doses numero .....*” which explains the quantity of doses, and in the next line “*Signa.*” after which there are instructions about drug taking.

Powders which have a **mass less than a minimal one (less than 0,1)** need the addition of filling (sugar (*saccharum*), glucose (*glucosum*)) in the dose of **0,2** or **0,3** and are written in full form with the list of all the ingredients and indication “*Misce ut fiat pulvis*” in the subscription.

## CAPSULES

**Capsules** are the covers for packing powders or some liquid medicines in them for taking inside.

Depending on the material they are made of, there are:

- 1) **starchy capsules** or oblatæ (capsulæ amylaceæ, s. oblatæ);

- 2) **gelatinous capsules** (capsulae gelatinosae), which are hard (capsulae gelatinosae durae), elastic (capsulae gelatinosae molles, seu elasticae) and with lids (capsulae gelatinosae operculatae);
- 3) **glutoidous capsules** (capsulae glutoidales, s. gelloduratae);
- 4) **different synthetic capsules.**

The rules of the prescribing capsules in detailed (full) variant of prescription differ from the rules of prescribing of simple powders **with the mass exceeding 0,1 (without added sugar)** only that in Subscriptio after showing the amount of supplying doses (D. t. d. N. ....) the name of capsule form is written: “in capsullis” (in caps.).

The rules of capsules prescribing in short variant of prescription: the word “Caps.” is written in the beginning of prescription before the drug’s name, after that follows the drug name in Latin (in genitive case), it’s dose and the quantity of doses (Numero). In the next line “Da. Signa.” with the information about the drug taking. In this case, there is no name of medicinal form in Subscriptio as the drug is prescribed in the short form.

## **TABLETS AND DRAGEE**

**Tablets** (tabuletta - nominative singular; tabulettam - accusative singular; tabulettas - accusative plural; tabulettis - locative plural) are the solid pharmaceutical form received by pressing medical substances or medical and auxiliary substances.

Tablets mainly are prescribed orally. Some kinds of tablets are used externally after the previous dissolution.

The tablets intended for application in an oral cavity, may be dispersed, chewing, sublingual (Tabulettae sublingualis). There are also tablets for hypodermal introduction – implantation tablets (Tabulettae implantatae).

**The positive qualities** of them are: the exactness of dosage, portability, the convenience of preservation and delivery.

**Their negative qualities** are slow action; sometimes they don’t dissolve.

**Dragee** (accusative case singular and plural - Dragee) – is a solid dosed pharmaceutical form for internal use, which is received by the way of stratification of the acting substances and auxiliary ones. Dragee as the tablets are made by the factory way. For dragee, it is an opportunity of incompatible medicinal substances' combinations.

Tablets and dragee mask unpleasant taste, protect the teeth and mucous membrane of the oral cavity from the destruction. In dragee it is possible to combine substances which are incompatible for different reasons (e.g., vitamins of B complex).

The rules of tablets and dragee prescribing in detailed (full) variant of prescription are the same as the ways of prescribing capsules in detailed (full) variant, but in Subscriptio it is written “in tabulettis” or “in dragee”.

The rules of tablets and dragee prescribing in short variant of prescription are similar to capsules prescribing in short variant, but the word “Tab.” or “Dragee” is written before the drug's name. In this case, there is no name of medicinal form in Subscriptio as the drug is prescribed in the short form.

Combined tablets and dragee with a **commercial name** (trade mark) are prescribed in another way: Tabulettarum (or Dragee), the drug's name, the number of doses (N.....), then in the next line “Da. Signa.” and instructions how to use this medicinal form. **In such prescriptions, drug's name is given in the Nominative Case and in inverted commas.**

## OTHERS

1. **Sinapismes** (Charta sinapis, Charta sinapisata) are the solid medical form as the rectangular-shaped pieces of paper coated with an oil-free powder black or zareththal mustard. Mustard plasters are issued in packages. They are intended for application to skin. These are the officinal forms, wrote out by the reduced way.

2. **Plates** are the solid medical forms intended for wounds treatment. They are made from the collagen with admixing medical substances (analogous of the medical films). They are intended for applications on the wound surfaces with local

action, released sterile. Prescribing plates we must indicate size according shapes of the wound.

3. **Caramel** (caramels) are the solid pharmaceutical form which prepared as sweets by the way of addition of melting acting substances, some sugar, treacle, with subsequent addition of flavouring, aromatic, dye components. Caramel is intended for per oral applications and for applications in an oral cavity (sublingual or intrabuccal applications attached to diseases of the gums, mucous membranes and throat) for dispersion.

4. **Pastilles or trochee** (trochisci) are the solid dosed medical forms, have the shape of a plate of the different form, intended for dissolution in the oral cavity (dispersion) for treatment diseases of the gums and oral mucous membranes; and are used inside for treatment diseases of the digestive tract.

5. **Lozenges** are the solid pharmaceutical form prepared as sweets. Normally, lozenges are intended for application in an oral cavity (for dispersion), therefore route of administration/purpose may not be used in the name of a pharmaceutical form.

6. **Cachets** are the shells for powders, which are obtained by pressing a mixture of wheat flour, starch and water between heated metal plates.

7. **Spansules** are capsules for oral administration, which contain a microdragee of medicinal substances with different duration of action. Microdragees have a diameter of 30-50  $\mu\text{m}$  and are characterized by different release times of the active substances depending on the ratio of the drug and the coating substance.

The main abbreviations used for prescribing of non-liquid (solid) dosed medicinal forms are: Rp. (Recipe), D. t. d. N. .... (Da tales doses numero ...); M. f. pulv. (Misce ut fiat pulvis); in caps (in capsullis); in tab. (in tabulettis); drag. (dragee); S. (Signa).

### **Examples of prescribing of non-liquid (solid) dosed drug forms**

1. Powders of the Thyreoidinum (20 mg). Take 1 powder 3 times a day for 25 days.

Recipe: Thyreoidini 0,02

Sacchari 0,3

Misce ut fiat pulvis

Da tales doses Numero 75

Signa. Take 1 powder 3 times a day for 25 days.

2. Powders of the Pancreatinum (500 mg). Take 1 powder 3 times a day for 8 days before meal.

Recipe: Pancreatini 0,5

Da tales doses Numero 24

Signa. Take 1 powder 3 times a day for 8 days before meal.

3. Capsules of Celecoxibum (100 mg). Take 1 capsule 2 times a day for 5 days.

Recipe: Celecoxibi 0,1

Da tales doses Numero 10 in caps.

Signa. Take 1 capsule 2 times a day for 5 days.

4. Tablets of Ramiprilum (10 mg). Take 1 tablet a day for 30 days.

**First variant (detailed):**

Recipe: Ramiprili 0,01

Da tales doses Numero 30 in tab.

Signa. Take 1 tablet once a day for 30 days.

**Second variant (short):**

Recipe: Tab. Ramiprili 0,01 N. 30

Da. Signa. Take 1 tablet once a day for 30 days.

In cases when you need to prescribe capsules or dragees in **detailed variant** as above, you change the drug form into the needed one (“in caps.” or “in dragee”) instead of “in tab.”

In cases when you need to prescribe capsules or dragees in **short variant** as above, you change the drug form into the needed one (“Caps.” or “Dragee”) instead of “Tab.”

Some complex tablets, such as “Aeronum” and other, are made under the special **commercial name**. These tablets are prescribed only by reduced way. In such prescriptions, drug’s name is given in the Nominative Case and in inverted commas:

Recipe: Tab. “Aeronum” N. 10

Da. Signa. Take one tablet under tongue until complete decomposition in half an hour before flight.

Recipe.: Dragee “Revit” N. 50

D.S. Take 1 dragee 2 times a day for 25 days.

## **2. SOFT DOSED MEDICINAL FORMS**

They are solid at the room temperature and are dissolved or melted at a body temperature. There are rectal suppositories (**suppositoria rectalia**), vaginal suppositories (**suppositoria vaginalia**) and sticks (**bacilli**) - suppositories intended for introduction in the cervical channel of the uterus, in urinary channel, acoustical duct, nose, which have cylinder shape with pointed end.

By medical purpose rectal suppositories are divided into 2 groups:

**1) with local action** - antihemorrhoidal, suppositories for healing cracks and breaks, for the treatment of inflammation processes of the rectum;

**2) with resorbative action** - suppositories with systemic action (medicinal substances which they contain (enzymes, antibiotics, barbiturates, antiseptic, hormones, vitamins, spasmolytics, analgetics, diuretics etc.)) are soaked in to the general blood flow through the system of the inferior and middle hemorrhoid veins. That is why, when prescribing strong-acting and poisonous substances in rectal suppositories, it is necessary to follow the same dosage rules as for dosage forms used orally.

Suppositories contain one or more acting substances, dispersed or dissoluble in a simple or complex basis which can be dissolved, dispersed, melted at body temperature. A suppository may include additional components, such as solvents,

absorbents, lubricant substances, antimicrobial agents and also solid fats, macrogols, gelatin mixtures (gelatin, water, glycerin), being their basis.

So, **suppositories include medical agent (agents) and formative substances (constituens)**. As formative substances are used such substances:

- a) Cacao-seed oil (*Butyrum Cacao*);
- b) Butyrol (*Butyrolum* - hydrogenized fat with various chemical structure);
- c) Gelatinous mixture (*Gelatinum*);
- d) Synthetic basis – polyäthylen-oxydum and others.

The weight of rectal suppositories is from 1,0 to 4,0 (*the average – 3,0*).

The weight of vaginal suppositories is from 1,5 to 6,0 (*the average weight – 4,0*).

Suppositories may be prescribed in a detailed (full) form, as well as in a short form. They may be written out by the method of a single dose, as well as by the method of a total dose. As a rule, a full form is used and the method of a single dose. A short form is suitable for suppositories of industrial manufacture (officinal) and for combined suppositories with commercial name.

To prescribe rectal or vaginal suppositories in a full form are written the name of **active substance** (substances), its (their) doses, then **formative substance** (if not specified which exactly formative substance you should take, then you take *Butyrum cacao*) is written in the next line: “*Butyri Cacao 3,0* (if it is rectal suppository) or *4,0* (if it is vaginal suppository)”. In subscription it should be indicated: “*Misce ut fiat suppositorium rectale* or *vaginale* (depending on the type of suppository). *Da tales doses Numero .....*”, then “*Da. Signa.*”.

To prescribe suppositories in a short form, “*Suppositorium*”, the name of the drug, the dose and the number of suppositories (N. ....), are written, then “*Da. Signa*” and instructions how to use this medication. The suppositories with a commercial name are prescribed without the dose. **The commercial name is given in the Nominative Case with inverted commas.**

The main abbreviations used for prescribing suppositories are: *supp. rect.* (*suppositorium rectale*), *supp. vagin.* (*suppositorium vaginale*), *M. f. supp. rect.* (*Misce ut fiat suppositorium rectale*), *M. f. supp. vagin.* (*Misce ut fiat suppositorium vaginale*).

### **Examples of prescribing of soft dosed drug forms**

1. 10 suppositories of Diphenhydramine (10 mg). Use one suppository into the rectum by night for 10 days.

Recipe: Diphenhydramini 0,01

Butyri Cacao 3,0

Misce ut fiat suppositorium rectale

Da tales doses Numero 10

Signa. Use one suppository into the rectum by night for 10 days.

2. 20 suppositories of Metronidazolum (500 mg). Administer vaginally twice a day for 10 days.

Recipe: Metronidazoli 0,5

Butyri Cacao 4,0

Misce ut fiat suppositorium vaginale

Da tales doses Numero 20

Signa. Administer vaginally twice a day for 10 days.

### **3. MEDICINAL FORMS FOR INJECTIONS**

Injections may be intravenous (IV), intramuscular (IM), subcutaneous (SC), etc.

**The positive qualities of injections** are: the exactness of dosage, the quickness of acting, the convenience of use for patients in a faint state (in the state of unconsciousness).

**The negative qualities** are: pain, the necessity of sterility, the possibility of vessel damage, the transmission of infection, etc.

For injections, drugs are often given as solutions and, less frequently, in crystalline suspension for IM and SC injection. An injectable solution must be free of infectious agents (**sterile**), pyrogens (**apyrogenic**) and suspended matter (**homogenic**). Types of injections are displayed in fig. 4.

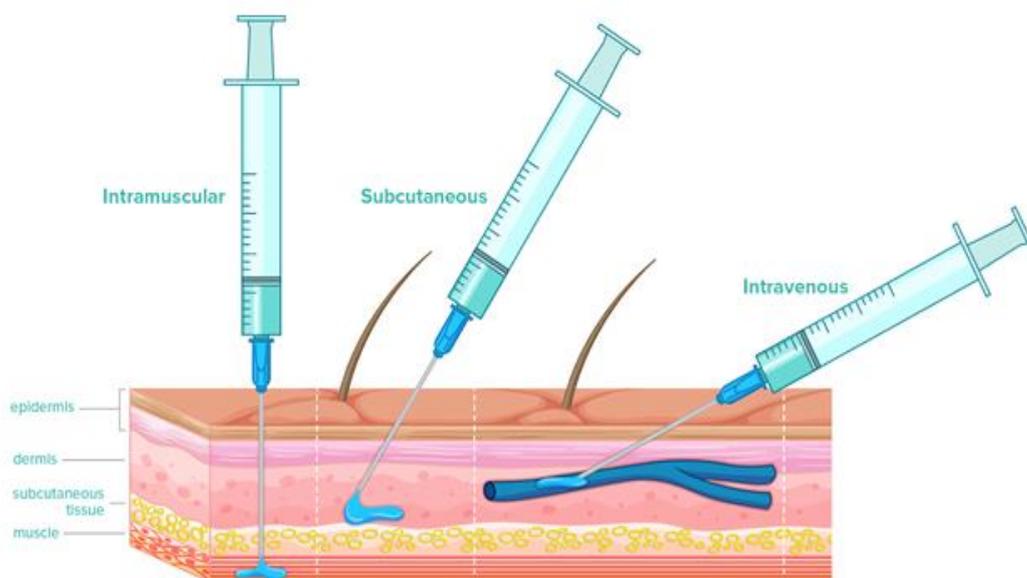


Fig. 4 – Types of injections

**Solutions for injections** are preserved in an airtight glass or plastic sealed containers (ampoules and flacons (bottles)). An example of ampoules and flacons are displayed in fig. 5.

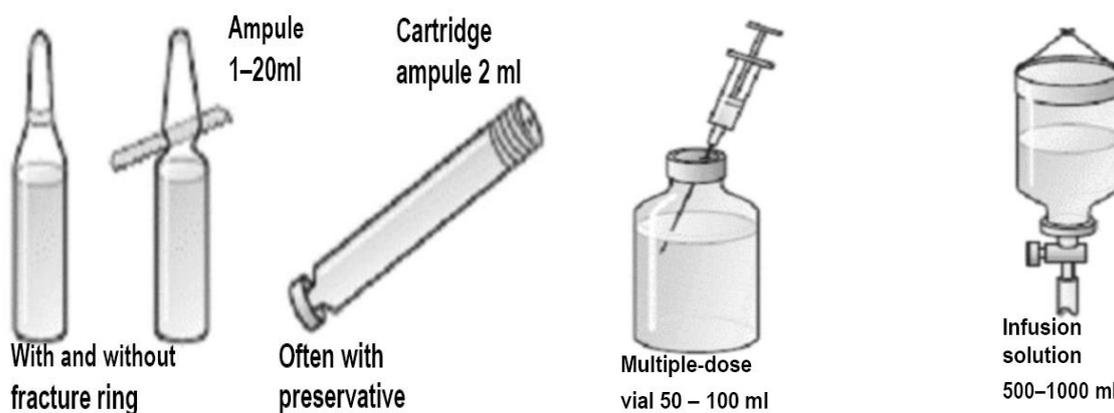


Fig. 5 – Ampoules and flacons containing sterile solutions

***Medicinal forms for injections of industrial manufacture (officinal)*** are prescribed in a short form of prescription by the method of a single dose. If a dose for one occasion has its packing (an ampoule), in *Subscriptio* after the number of doses “*in ampullis*” (*in ampull.*) is written.

The rules of prescribing of the officinal sterile forms in flacons are similar, but the name of medicinal form (*in ampullis*) **is not indicated.**

*Medicinal forms for injections of chemist's preparing (magistral)* can be prescribed in a short as well as in a full form of prescription. In subscription, except usual marks, a note about medicine's sterility must be done: "*Sterilisetur!*" (*Steril.!*).

The main abbreviations used for prescribing sterile medicinal forms for injections are: Sol. (solutio), in ampull. (in ampullis), Steril.!! (Sterilisetur!!), IM (intramuscularly), SC (subcutaneously), IV (intravenously).

### **Examples of prescribing of medicinal forms for injections**

1. 5 ampoules each containing 2 ml of 12,5 % solution of Etamsylatum.  
Administer IV.

Recipe: Sol. Etamsylati 12,5 % - 2 ml

Da tales doses Numero 5 in ampull.

Signa. Administer IV.

2. 2 flacons each containing 20 ml of 0,5 % solution of Remdesvirum.  
Administer IV.

Recipe: Sol. Remdesviri 0,5 % - 20 ml

Da tales doses Numero 2

Signa. Administer IV.

## **NON-DOSED MEDICINAL FORMS**

*Non-dosed medicinal forms* are drug forms which are prescribed with the total amount (dose) of the drug and are dosed by patient. They are prescribed without the number of doses. The total amount of the drug is indicated and the patient takes so much medication, as it's necessary (as written in "Signa." part). Non-dosed medicinal forms are divided into 3 groups:

- a) *non-liquid (solid)* (powders for external use, aspersiones).
- b) *liquid* (solutions, eye drops, ear or nose drops, infusions, decoctions, tinctures, liquid extracts and mixtures for external use).
- c) *soft* (ointments, liniments, pastes, plasters, applicitions, poultices).

## 1. POWDERS FOR EXTERNAL USE AND ASPERSIONS

Powders (pulvis, pulveris) for external application consist of solid separate dry particles of a varying grinding degree.

By the grinding degree the following powders are distinguished:

- the large powder;
- the small powder;
- the smallest powder (pulvis subtilissimus).

As a rule, for external application the smallest powders are intended. They are characterized by quick absorption, less irritating the damage tissues.

The smallest powder for external application (pulvis subtilissimus) contains **only** medicinal substances. Aspersion (aspersio) is a smallest powder containing medicinal substance (or substances) **and formative (inert) substances**.

As formative (inert) substances, they use **Talcum, Zinci oxydum, Amylum**. Powders for external use and aspersion are prescribed in a short form, as well as in a full form. Their amount may be from 5,0 to 100,0. If aspersion is prescribed in a short form, after "Rp" it is indicated "Aspersionis", the name of the drug, the concentration in percent and the total amount of such medicinal form.

### **Examples of prescribing powders for external use and aspersion**

1. Recipe: Natrii hydrocarbonatis 20,0

D.S. Dissolve 1 teaspoon of the powder in a glass of warm water. Use the solution for gargling the throat.

2. Recipe: Streptocidi subtilissimi 50,0

D.S. Use on the wound surface.

Prescription of Amycazolium aspersion in **detailed** variant:

Recipe: Amycazoli 5,0

Talci ad 100,0

Misce ut fiat pulvis

Da. Signa. Apply on the skin twice a day.

The word “ad” in this example means “to reach”. So, in this case the chemist will firstly take 5,0 of Amycazolium and then he will add Talcum in the amount to reach 100,0.

The same prescription of Amycazolium aspersion but in **short** variant:

Recipe: Aspersionis Amycazoli 5% - 100,0

D.S. Apply on the skin of twice a day.

## **2. GRANULES**

**Granules** (granula - nominative singular, granulam - accusative singular and granulas - accusative plural) - the solid medicinal form which looks like homogeneous fractions (grains, kernels) spherical, cylindrical or anomalous form, scale 0,2-0,3 mm, which consists of the mixture of acting substances with or without fillers. They are produced at the factories and plants in single-dosed or multi-dosed containers. Granules are undosed medicinal forms. That is why in prescription the total amount (weight) is indicated. Granules are dosed by a teaspoon. Some kinds of them should be dissolved in water and taken as a liquid medical form.

### **Example of prescribing granules**

Recipe: Gran. Calcii glycerophosphatis 100,0

D.S. Take 1 tea spoon 3 times a day.

## **3. DENTAL POWDERS**

**Dental powder** (pulvis dentalis) - it is a solid medical form, white powder with calcium carbonate precipitated as general component. Besides dental powders include other oils (mint, anise, pink or gum -tree oils) which endow them pleasant smell and deodorant property. They are prescribed like undosed powders for external application with the mass of 100,0.

#### **4. LIQUID NON-DOSED MEDICINAL FORMS**

Liquid medicinal forms include solutions, tinctures, infusions, decoctions, balsams, liquid extracts, mixtures, suspensions, syrups, and other medicinal products. These medicinal forms are dosed in milliliters, some of them – in drops. Liquid forms are better entering blood, soaking up in the skin and acting more quickly than solid medicinal forms. But these forms have such shortcomings of using them in drops, spoons or cup doses. Their peculiarities may change under the influence of surrounding environments, such as light, air.

**The advantages:**

- 1) they are sucked and act quicker;
- 2) they are convenient for children;
- 3) they are suitable for prescribing hygroscopic substances.

**The disadvantages are:** less portability, unsteadiness, the difficulty of dosage.

**Solutions (Solutio)** are the simplest liquid medicinal form which is intended for **external applications, internal applications and for parenteral administrations.** This form is made by dissolving non-liquid or liquid medicinal substances in a solvent. The most frequently used solvents are: purified water (Aqua purificata), ethyl spirit (Spiritus aethylicus) with the concentration of 90 %, 70 %, 40 %, glycerin (Glycerinum) and oils: peach-kemel oil (Oleum Percsicorum), olive oil (Oleum Olivarum), Vaseline oil (Oleum Vaselini) and others.

By the type of solvent the solutions can be divided into water, alcoholic, oil and other (non-aqueous) solvents.

If the solvent is not water, this should be specified while composing a pharmaceutical form. If solvent is not specified in the prescription, then the solution is prepared on distilled water.

**Solutions for external use** are used as drops (eye drops, nasal drops and eardrops), for lotion, bathing wounds, irrigation, gargling the throat, etc. and can be prescribed in a short and full form. We prescribe solutions for external use in the quantity of 5-100 ml and more, ear, nose and eye drops - 5-10 ml (as the rule).

**Eye drops** are the kind of solutions for external use, but they must be sterile. That is why eye drops are prescribed with the indication “*Sterilisetur!*” or abbreviation “*Steril.!*”

**Aqueous solutions** for processing of dental root channels, eye, nasal and ear drops are prescribed in the amount of 5-10 ml, solutions for processing wounds – 50-500 ml, solutions for gargling – 200 ml, solutions for the lavage of the stomach and for disinfection – 500-1000 ml. As a rule, these solutions are prescribed in a short form, and their concentration is expressed in percent.

**Oil or alcohol solutions** we prescribe in the short form, the concentration of these solution must be labeled in percentage. After the word Sol., the name of the medicinal substance should be indicated and the solvent - oleosae (oil) or spirituosae (alcohol). Then the concentration, the total amount of the solution, D.S. and directions on how to use this medicinal form need to be written out. The volume of **alcohol solution** should be less than 100 ml. **Oil solutions** are prescribed in the total amount of 10-100 ml.

If the solution needs to be made in a drugstore (using alcohol or oil as a solvent), the full form is the only variant to prescribe its prescription. In such a case, after the word Rp.: the name of the medicinal substance with the indication of its quantity in grams and the name of the solvent with its quantity in ml need to be indicated. From the new line we need to write "Misce. Da. Signa.

#### **Examples of prescribing non-dosed solutions for external use**

1. Recipe: Furacilini 0,1

Aq. pur. 500 ml

M.D.S. For bathing wounds.

2. Recipe: Sol. Furacilini 0,02% - 500 ml

D.S. For bathing wounds.

3. Recipe: Phenoli 1,5

Glycerini 10 ml

M.D.S. Eardrops. Use 2-3 drops in each ear (to warm up before use).

4. Recipe: Sol. Atropini sulfatis 0,5% - 5 ml

Da. Signa. Apply 2 drops into each eye.

5. Recipe: Sol. Acidi salicylici spirituosae 2% - 100 ml

D.S. For rubbing small abscesses of the skin.

6. Recipe: Sol. Ergocalciferoli oleosae 0,125 % - 20 ml

D.S. Use 1 drop once a day.

7. Recipe: Sol. Kalii permanganatis 0,1% – 200 ml

D. S. For gargling.

8. Recipe: Sol. Anaesthesini oleosae 5% – 50 ml

D. S. Use on mucous membrane of the oral cavity.

9. Recipe: Sol. Viridis nitentis spirituosae 1% – 10 ml

D. S. For the processing of small cuts of the skin.

**Solutions for internal use** are prescribed by **the method of a total dose**. This is a method when after the name of a substance its total dose and the whole volume of medicine are noticed. The dose of the medicine for one administration (a tablespoon, 10 drops, etc.) is noticed in “Signa”.

All liquid medicinal forms which are prescribed for internal use and measured by spoons are only prepared with distilled water.

**Solutions for internal use** is a liquid dosed medicinal form that consists of a solvent and a soluble substance. The concentration of solutions prescribed in a short form can be expressed in mass-volume correlation, in percent, but by strong diluting it is expressed in the ratio (1:500, 1:1000, etc).

The generally used volume units of dosage are: a *tablespoon* – 15 ml, a *dessert spoon* – 10 ml and a *teaspoon* – 5 ml (additionally, a *coffee spoon* – 2,5 ml).

Solutions for internal use can be prescribed in a short or full form.

They are prescribed for 3-4 days of the treatment in the volume of 100-200 ml (average – 180 ml for 12 administrations).

**Solutions for internal use in drops** are prescribed by the same way as solutions dosed by spoons. It is necessary to recalculate common number of the drops in the volume unit (ml) of the drug quantity. The common number of the drops is recalculated

multiplying single drops dose on the receptions (administrations) number. This value is transferred into milliliters by the way of its division on the number of drops in one milliliter.

We must take into account that:

- *1 ml of the water or water solution includes 20 drops;*
- *1 ml of the oil solution – 30 drops;*
- *1 ml of the spirit or alcoholic solutions – 50 drops;*
- *1 ml of the ether solution – 80 drops;*

For example, it is necessary to prescribe for patient Platyphyllin hydrotartras (Platyphyllini hydrotartras, pro dosi 0,002 g) solution intended for internal use in 10 drops twice a day during 20 days.

These calculations are made:

Number of receptions: 2 (twice a day) x 20 (days) = 40 receptions

Quantity of platyphylline: 0,002 (single dose) x 40 (receptions) = 0,08

Solution common quantity: 10 drops x 40 receptions = 400 drops, so

400 drops : 20 drops (amount of drops in 1ml of water solution) = 20 ml; or

0,5 ml (10 drops) x 40 (receptions) = 20 ml

So, prescription will be like this:

Recipe: Platyphyllini hydrotartratis 0,08

Aquae destillatae ad 20 ml

M.D.S. For internal use in 10 drops twice a day.

Or if to write out this prescription by the short method we must calculate solution concentration in percent:

$(0,08 \text{ (dose in 20 ml)} : 20 \text{ ml (total volume, ml)}) \times 100\% = 0,4\%$

Our prescription will look like:

Recipe: Sol. Platyphyllini hydrotartratis 0,4% - 20 ml

D.S. For internal use in 10 drops twice a day.

***Infusions and decoctions*** are aqueous extractions from medicinal plants. They are galenic preparations containing ballast substances. Infusions and decoctions are only prescribed in a short form of prescription. They are always made in the correlation

of 1:10, so they are prescribed without the indication of the weight of the dry medicinal plant. Only the total amount of such liquid form is indicated according to the purpose of its application.

**Tinctures, liquid extracts, and neogalenic preparations** are alcohol-containing preparations from medicinal plants and are prescribed in the total amount less than 100 ml because of alcohol contents. They are taken by mouth and are dosed in drops. How many drops of such a medicinal form the patient must take inside for one administration, so many milliliters of tincture or extract should be prescribed. Tinctures, liquid extracts, and neogalenic preparations are prescribed in a short form.

**Mixtures** also may be prescribed for external use. In this case we use a full form of prescribing in which list all the ingredients of the drug and point “Misce”.

Liquid medicinal forms for administration through upper airways are inhalations and aerosols. Inhalation is dosed medicinal form used as highly dispersed liquid or vapor administered through the upper respiratory passways. Aerosol is spray, modern medicinal form of industrial manufacture for inhalation (dosed aerosol) or external use (non-dosed aerosol). As a rule, above mentioned forms are prescribed in the short form.

The main abbreviations used for prescribing liquid dosed medicinal forms are: Sol.(solutio), inf. (infusio), dec.(decoctio), tinct. (tinctura), extr. (extractum).

### **Examples of prescribing non-dosed solutions for internal and parenteral use**

1. 5% solution of Natrii salicylas for internal use, 100 ml. Take 1 table spoon 3 times a day.

Recipe: Sol. Natrii salicylatis 5 % - 100 ml

Da. Signa. Take 1 table spoon 3 times a day.

2. 200 ml of sterile 5% solution of Glucosum for IV infusion

Recipe: Sol. Glucosi 5 % - 200 ml

Sterilisetur!

Da. Signa. Use IV.

3. Tincture of Arnica. Take 30 drops daily.

Recipe: T-rae Arnicae 30 ml

Da. Signa. Take 30 drops daily.

4. Infusion of herbae Adonidis vernalis 500 mg. Take 1 table spoon 3 times a day for 4 days.

Recipe: Infusi herbae Adonidis vernalis 6,0 - 180 ml.

D.S. Take 1 table-spoon 3 times a day for 4 days.

In the example 4, the dose “6,0” and the volume “180 ml” are calculated from the single dose (500 mg) and 12 table spoons (15 ml each) intakes for 12 receptions:

0,5 (500 mg, single dose) x 12 receptions = 6,0

15 ml (1 table spoon) x 12 receptions = 180 ml

## **5. OINTMENT (UNGUENTUM), LINIMENTS (LINIMENTUM), PASTES (PASTA), CREAMS (CREMOR), LOTIONS (LOTIO), GELS (GELUM), PLASTERS (EMPLASTRUM)**

**Ointments (unguents)** (unguentum – nominative singular, unguenti – genitive singular) – the soft medical (drug) form intended for external application. Ointments contain one or more active substances and formative auxiliary agents.

As a formative auxiliary agent for the ointments are used:

1. Vaseline or white petrolatum (Vaselinum);
2. Lanolin (Lanolinum);
3. Pork cleared fat (Adeps suillus depuratus, s. Axungia porcina depurata);
4. Officinal glyceric unguent (Ung. Glycerini);
5. Officinal naphthalan unguent (Ung. Naphthalani);
6. Officinal spermacetial unguent (Ung. Cetacei).

**There are magistral and officinal ointments.** The magistral ointments, that contain of one medical substance and Vaseline, can be written out by reduced and detailed (full) ways. In the first case we write after the word “Rp.” Unguenti, name of the medicinal substance and its concentration in %, total quantity of the ointment.

Rp.: Ung. Prednisoloni 0,5% - 20,0

D. S. Grease the affected regions of the skin

For prescribing this ointment by detailed (full) way, after the word “Rp.” we must write all medical agents, included into the ointment, their quantity, further from a new line – *Misce ut fiat unguentum* (reduced *M. f. ung.*), then in the next line “D. S.” and mark the way of its use. In such case it is needed to give account how many grams of prednisolone and vaseline we need to take for the preparing of the ointment, by making calculations of given concentration and total quantity of the ointment.

We write this way:

0,5% prednisolone ointment - this is such ointment, which contains:

0,5 grams of prednisolone in own 100 grams. So, X grams of prednisolone will be in the 20 grams of this ointment. These correlations formed such proportion:

$$\begin{array}{l} 100,0 - 0,5 \\ 20,0 - x \end{array} \quad x = 20,0 * 0,5 : 100,0 = 0,1$$

Thus, for preparing 20 grams of the 0,5% prednisolone ointment we must take 0,1 grams of prednisolone and the rest will be made by vaseline.

Rp.: Prednisoloni 0,1

Vaselini ad 20,0

M. f. unguentum

D. S. Grease the affected regions of the skin.

The word “ad” in this example means “to reach”. So, in this case the chemist will firstly take 0,1 of Prednisolonum and then he will add Vaselinum in the amount to reach 20,0.

If we write out the ointment by reduced (short) way (the ointment basis is not specified), such ointment is prepared on vaseline in the drugstore.

The ointments are written out only by the developed (full) way in case it is necessary to prepare ointment not on vaseline, but on other bases, and also when ointment contains of two or more medical substances.

Rp.: Anaesthesini 0,5

Xeroformii 5,0

Vaselini ad 50,0

M. f. ung.

D. S. Grease the affected regions of the skin.

**The officinal ointments** are prescribed only by the reduced (short) way, irrespective of their structures. In the prescription we indicate its name and total quantity. The concentration has not need to be specified.

Rp.: Ung. Hydrargyri oxydi flavi 10,0

D. S. Pawn for lower eyelid by night.

Total quantity of the ointment for the treatment of skin (mucous) must be 20,0-100,0 grams and more and as for ophthalmic ointment - it is 5,0-10,0 grams.

If structure of the ointment includes medicinal substance which quantity is underlined in the action units (U), the prescription on such ointment can be written out by the reduced way (if ointment should be made on vaseline) with indication of the U drug quantity in the 1 gram of ointment.

Rp.: Ung. Tetracyclini 20,0 (1,0 - 10000 U)

D. S. Grease the skin in the affected regions.

**Rectal ointment** (unguentum rectale). Officinal ointment produced by pharmaceutical industry in the special forms for application into the rectum cavity. It is the dosed form because this ointment is mentioned for resorbitive action.

**Vaginal ointment** (unguentum vaginale). It is the officinal dosed ointment intended for introduction into the vagina. This ointment is produced in the special forms.

**Urethral ointment** (unguentum urethrale). This is the variety of the dosed ointment intended for introduction into the urinary channel. It has the local action. This unguent is produced in the syrettes for dosed applications connected with narrow aperture of the urethra.

**Liniments** (linimentum - nominative singular, linimenti - genitive singular) are also the variety of the ointments. But these are the soft medical products, liquid ointment for local application, which contain up to 5 % of hard substances.

As constituents for preparing liniments are used vegetative or mineral oils. Liniments are prescribed *only by the detailed (full) way*.

We must write all ingredients and their quantities after the word “Rp.”, then from a new line write down “Misce ut fiat linimentum” (“M. f. lin.”) and “D. S.” indicating the way of use.

Rp.: Mentholi 2,0

Ol. Helianthi ad 50,0

M. f. lin.

D. S. Rub in strucked joints.

*Official liniments are written out by the reduced (short) way.*

Rp.: Lin. Ammoniaci 40,0

D. S. For rubbing lumbar region.

Rp.: Lin. Sythomycini 10% - 25,0

D. S. Render to the edges of the wound.

**Paste** – is the soft medicinal product for local application, the variety of the ointment, that contained *from 25 % up to 65 % powder like substances, so it is the thick ointment.*

Paste contains one or more active substances and fats and fat like substances which are used for manufacturing ointments, forming the base.

If powder medical substances which are contained into the paste, make less than 25 % of its weight, then in that case it is necessary to increase their quantity by expense of addition of indifferent substances as talc (Talcum), zinc oxide (Zinci oxydum), starch (Amylum), lycopodium (Lycopodium), white clay (Bolis alba) and others.

Magistral pastes are prescribed only by detailed (full) way. For example, it is necessary to write out 50,0 grams of paste, which contains 10 % of anaesthesine (Anaesthesinum) and 1 % of menthol (Mentholum). For receiving paste consistence, it is necessary to add the indifferent powder in any quantity in limits 25-65 % from the total paste quantity.

All ingredients of the paste are written out in the weight units. So, we must make the proportion:

For anaesthesine:

10,0 - 100,0

$$x - 50,0$$

$$x = 10 \times 50 : 100 = 5,0$$

That means, anaesthesine needs to be taken 5 grams.

For menthol:

$$1,0 - 100,0$$

$$x - 50,0$$

$$x = 1,0 \times 50,0 : 100,0 = 0,5$$

That means, menthol needs to be taken 0,5 grams.

The quantity of the indifferent powder (for example, talcum) can be in limits 12,5-32,5 gr. (25-65 % from 50 grams of paste).

The vaseline quantity is necessary to calculate like this: subtract from total paste quantity (50 grams) the weight of all previous components (5 grams of anaesthesine, 0,5 grams of menthol, 12,5 grams of talcum) or instead write out – ad 50,0.

Rp.: Anaesthesini 5,0

Mentholi 0,5

Talci 12,5

Vaselini ad 50,0

M. f. pasta

D. S. Apply to the affected parts of the skin.

If medicinal substance, included into the paste structure, is a powder and is not dissolved in the ointment base, prescribing paste it needs to be taken in account, that total quantity of powder in the paste must be not more, than 65 % from the paste general mass.

For example, it is necessary to prescribe 50 grams of paste, that consists of 20 % of zinc oxide. In such case preparing paste it is necessary to take the quantity of the indifferent powder, not more than 45 %, because 20 % + 45 % = 65 % (the top limit of the allowable quantity of the powder in the paste). The prescription (as an example it includes 50% of powders) looks like this:

Rp.: Zinci oxydi 10,0

Talci 15,0

Vaselini ad 50,0

M. f. pasta

D. S. Apply to the affected parts of the skin.

In this case the powders weight is 50 % of the total paste mass. The officinal pastes are prescribed by the reduced (short) way:

Rp.: Pastae Antisepticae biologicae 10,0

D. S. Apply to the gums by night.

**Creams** (cremor - nominative singular, cremoris - genitive singular) – the soft medicinal products for local application, the variety of the emulsion ointments, produced without addition of the emulsifier.

They represent one, two - or multiphase dispersion systems, which dispersion environment at certain storage temperature is, as a rule. They differ from ointments by sourcream-like (semiliquid) consistence and small stability. Creams have cooling action and rapidly skin soaked. Into the medicinal and cosmetic creams are added aromatic substances.

Creams are intended for application on skin and its appendages wounds, ulcers, certain mucous membranes.

They are prescribed by the reduced (short) way with indication of the percentage concentration of the medical substance or only its quantity (for the officinal creams).

Recipe.: Cremoris Canesteni 1% - 20,0

D. S. Rub skin in the strucked regions.

**Gels** are the soft medicinal products for local application; the ointments prepared on the hydrophilic bases with gel-like (sem -liquid, galantine-like) consistence. They are one, two - or multiphase dispersion systems with the liquid dispersion medium, which rheological properties are conditioned by presence of gelatinizes in small concentration. Gelatinizes can act as stabilizers of suspensions. That's why such gels can refer to suspension gels or emulgels, respectively. In gels medicinal substances allotted to skin more evenly and acts for the tissues.

By mode of application the gels can be divided in gels for external application (troxevasin-gel, voltaren-gel, indovasine-gel), for peroral application (jelly), which is

the most frequently used in pediatric practice (almagel, phosphalugel), as well as nasal, eye, ear, rectal, vaginal, cervical, urethral, stomatological gels, gels for inhalations ("Mentoclar"). Gels are prescribed by the reduced way (officinal gels) or with indication percentage substance concentration.

Recipe.: Geli Troxevasini 2% - 40,0

D. S. Grease in the region of the foot atrophic ulcer.

**Lotions** (lotio - nominative singular, lotionis - genitive singular) - alcohol-oiling liquids, which contain cooling and antiseptic substances. They are intended for external applications (for purification, disinfection the skin of the face, ears, sometimes nose mucous); there are also eye lotions.

Lotions are prescribed as officinal medicinal forms.

Recipe.: Lotionis Zinci spirituosae 100 ml

D. S. For application on damaged skin.

**Plasters** are the soft medical form, transdermal therapeutic systems. They are looking like the plastic mass which capable of melting at body temperature and sticking to skin, or the mass applied on the carrier (fabric). Plasters are intended for external application (for skin application) and have local action. There are regular (hard) and liquid (skin glues) plasters, smeared (on the fabric or paper bases) and unsmeared (look like conic or cylindrical pulley-blocks) plasters and also rubber (an adhesive plaster, capsicum, corn) plasters.

By medicinal prescription they are differed to the epidermatic plasters (without medical agents, used as dressing material - leucoplasters) and endermatic plasters with keratolytic, depilatory and other medical substances for treatment dermal diseases (local action) and with irritative substances (reflex action).

Ability for melting and sticking to skin provides with plaster-base, which is prepared on fusion of the rosin, paraffin, wax, caoutchouc and some other substances. They are manufacturing in the plants and at the factories.

Plasters are prescribed by the reduced (short) way, because they are undosed medicinal forms. After indication of the form (emplastri - genitive singular) we must

write down the plaster name, its quantity (if it is unsmearred and prescribed on the blocks –20,0 - 50,0), or its size (if it is fabric smearred with indication length and width).

Recipe.: Emplastri bactericidi adhaesivi 10 x 6 cm

D.S. Fix the edges of the wound.

**Liquid plasters.** It is the skin lacquers which contain the volatile substances, form the skin films after dissolvent evaporation. They are produced by the way of dissolution the medical substances and detergents in the volatile fluid likes ether or ethyl spirit.

They are officinal plasters produced in the bottles or in the aerosol balloons. Liquid plasters are widely used in the surgical and dermatological practices, for example – cleol (Cleolum) and collodion (Collodium).

Recipe: Cleoli 100 ml

D.S. For protection of scratched skin.

**Transdermal systems** (Transdermalia systemata) or diadermatic plasters are intended for medicinal agents penetrating through the skin with resorbitive action and with influence over the more deeply situated layers of the skin. Nowadays native and foreign industries produce such plasters with nitroglycerin: nitroderm (“Nitroderm”), nitrodur (“Nitrodur”) and nitradisc (“Nitradisc”). They are dosed (50 mcg nitroglycerin in one plaster) and ensured long action of the medicine by the way of its entering into the blood (up to 24 hours). They are sticking to skin of the left front-lateral thorax surface or to the skin of the left forearm for treatment of ischemic heart disease.

Of course, nowadays there are many modern medicinal forms (e.g., aerosols, dissolved tablets, spansules, micronized forms, etc), but the forms described above stay the most spread.

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