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B. Pharmacy

Pharmaceutics

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Prescription

- A prescription is a **written** communication from a registered medical practitioner or other licensed practitioner to pharmacist representing salient information regarding **dispensing** of prescribed medication

- It is specific in character and designates a particular **medication** for a particular **patient** at a particular **time**

- It is a mechanism through which treatment is provided for a patient by the combined **skill** and services of both the **physician** and the **pharmacist**

Important features of a prescription:

- ✓**Directions** are given to the **pharmacist** about what type of preparation (tablet, power, mixture etc.) is to be prepared.

- ✓It contains directions for the **patients**, the dose of the drug and the dose interval, and how it is to be taken.

- ✓Prescriptions are generally written in **Latin** language, so that the prescription remains unknown to the patients to avoid **self-medication**.

Types of Prescription

1) Compounded prescription:

- Extemporaneous prescription
- It is an order that require mixing of one or more drugs with one or more excipients
- The doctor selects the drug, dosage and pharmacist prepares accordingly
- The name of each drug is placed on a separate line right under the preceding one

2) Non-compounded prescription:

- Not require mixing of two or more ingredients to obtain finished product
- A pre-compounded order consists of a drug or a mixture of drug supplied by a pharmaceutical company by its official name and if it contains more than one substance, the specific ingredients do not have to be listed.

Parts of Prescription

1) Date

- Date on the prescription helps the pharmacists to know when the medicines were last dispensed if the prescription is brought for redispensing.
- In case of habit forming drug the date prevents the misuse of the drug by the patient.

2) Name, age, sex and address of the patient

- By name and address the patient and the prescription can be identified.
- Age and sex of the patient is especially required for child patient to check the prescribed dose.

3) Superscription

- It is represented by a Latin symbol **℞**, an abbreviation of Latin term ‘recipe’ which means ‘you take’

- In olden days, the symbol was considered to be originated from the sign of **Jupiter**, the Greek **God of healing**. This symbol was employed by the ancient in requesting God for the quick recovery of the patient

4) Inscription

- This is the **main** part of the prescription.
- It contains the **names and quantities** of the prescribed medicaments.
- The medicament may be **official** preparation or **non-official** preparation. If is official preparation (i.e. from pharmacopoeia or formulary) then only the name of the preparation is written e.g. Piperazine Citrate Elixir IP.

✓If it is nonofficial preparation then the quantity of each ingredient will be given. The type of preparation will also be given e.g.

✓Sodium bicarbonate 3g

✓Simple Syrup 6ml

✓Purified Water q.s. 100 ml

- The inscription of prescriptions containing several ingredients are divided into the following parts:

a) **Base:** The **active medicaments** those are intended to produce the therapeutic effect.

b) **Adjuvants:** These are included either to enhance the action of the drug or to make the preparation more palatable.

c) **Vehicle:** It is the main **carrier** of the drug. In liquid preparations drugs are either dissolved or dispersed in the vehicle.

5) Subscription

- In this part the prescriber gives **direction to the pharmacist** regarding the **dosage form** to be prepared and the **number of doses** to be dispensed.

6) Signatura

- It is usually written as ‘Sig.’.
- The **instructions** given in the prescription should be written on the **label of the container** so that the patient can follow them.
- The instructions may include:
- (a) The quantity to be taken (b) The frequency and timing of administration of the preparation (c) The route of administration (d) The special instruction (if any)

7) Renewal instructions

- The prescriber indicates in every prescription, whether it should be renewed, and if renewed, for **how many times**. It is very important particularly for the case of **habit forming** drugs to prevent its misuse.

8. Signature, address and registration number of the prescriber

- The prescription must be signed by the prescriber by his / her own hand. His/her address and registration number should be written in the case of dangerous and habit forming drugs.

Example of Typical Prescription

SHARMA NURSING HOME
New Delhi

Name: Mr. N. Anand *Age*: 42 years Sex: Male
Address: 32, Azad Nagar, New Delhi

℞ (Superscription)

Inscription

Sodium bicarbonate	3 g
Compound tincture of cardamom	2 ml
Simple Syrup	6 ml
Purified Water q.s.	

90 ml
Fiat misture. (Subscription)
Sig. Cochleare magnum ter in die post cibos sumenda. (Signatura)
Refill:……

Sd/-
Dr. Aswini Sharma
Regn. No. 14328

Handling of Prescription

- The following procedures should be adopted by the pharmacist while handling the prescription for compounding and dispensing:

i) Receiving

ii) Reading and checking

iii) Collecting and weighing the materials

iv) Compounding, labeling and packaging

i) Receiving:

- The prescription should be received by the pharmacist himself / herself.
- While receiving a prescription from a patient a pharmacist should not change his/her **facial expression** that gives an impression to the patient that he/she is confused or surprised after seeing the prescription.

ii) Reading and checking:

- After receiving the prescription it should be screened behind the counter.
- The prescription is a hospital slip or from a nursing home or from a private practitioner and their **authenticity** should be checked. The **signature** of the prescriber and the **date** of prescription is checked.
- The pharmacist should read all the **lines and words** of the prescription. He/she must **not guess** any word. If there is any doubt, the pharmacist should consult with the other pharmacist or the prescriber over telephone

iii) Collecting and weighing the materials:

- Before compounding a prescription all the materials required for it should be collected from the shelves or drawers and kept in the **left hand side** of the balance.
- After measuring each material should be kept on the **right hand** side of the balance.
- After compounding the prescription the materials are replaced back to the shelves / drawers where from they were collected.

✓While compounding, the label of every container of material should be checked **thrice** in the following manner:

✓When collected from the shelves/drawers.

✓When the materials are measured.

✓When the containers are replaced back to the shelves/drawers.

iv) Compounding, labeling and packaging:

- Only one prescription should be compounded at a time.
- Compounding should be done on a clean table.
- All equipment required should be cleaned and dried.
- The preparation should be prepared according to the direction of the prescriber or as per methods given in **pharmacopoeia or formulary** are according to established pharmaceutical art of compounding.

The compounded preparations should be filled in suitable containers.

Round vials	For tablets and capsules
Oval bottles Narrow mouthed	For liquid of low viscosity e.g. mixtures, oral emulsions etc.
Wide mouthed bottles	For filling liquids of high viscosity, large quantities of tablets or capsules and bulk powders.
Colored fluted bottles	For external preparations e.g. liniment and lotions.
Ointment jars and collapsible tubes	For ointments, creams or any other semisolid dosage forms.
Paper wrappers and envelops	For oral powders in divided doses.
Dropper bottles	For eye drops and ear drops.
Sifter top containers	For dusting powders.

Information Written on Label

Type of preparation:	The Emulsion, The Mixture, The Powder etc. Its quantity should also be mentioned
For:	Name, Age and Sex of the patient
Date of dispensing:	Date on which the prescription is dispensed
Expiry date if any:	e.g. ‘Must be taken within 7 days of dispensing’
Directions for use:	e.g ‘One teaspoonful thrice daily’
Storage condition:	e.g. ‘Keep in a cool place’
Secondary labeling:	e.g. ‘Shake Well Before Use’ ‘For External Use Only’
Name and signature	of the pharmacist who dispensed
Name and Address	of Pharmacy

- The container should be **polished** to remove any finger print.
- While delivering the preparation to the patient the pharmacist should explain the **mode** of administration, **direction for use and storage**.

Error Prescription: Medication Error

1) **Prescribing error:** Incorrect drug selection, dose, dosage form, quantity, route of administration, rate of administration, instructions by physician
2) **Omission error:** Failure to administer regular dose before the next scheduled dose (TB patient)
3) Wrong time error: Missing of predefined interval
4) Unauthorized error: Prescriber is not RMP
5) Improper dose:
6) Wrong dosage form error
7) Wrong drug preparation error
8) Wrong administration technique
9) Deteriorated drug error
10) Monitoring error
11) Compliance error and other medication error: inappropriate patient behavior

Sources of Error in Prescription

1) Abbreviation

- In most of the prescriptions abbreviated terms are used by the prescriber that leads to major errors during interpretation by the pharmacists.
- e.g. ‘SSKI’ is the abbreviated term of ‘Saturated Solution of Potassium Iodide’.
- It is preferable to avoid this types of misleading abbreviations.

2) Name of the drugs

- Names of some drugs (especially the brand names) either looks or sounds alike. So any error in the name of a drug will lead to major danger to the patient.

  e.g. Althrocin – Eltroxin, Acidin – Apidin etc.

3) Strength of the preparation:

- Drugs are available in the market in various strengths. So a drug must not be dispensed if the strength is not written in the prescription. e.g. Paracetamol tablet 500 mg should not be dispensed when no strength is mentioned in the prescription.

4) Dosage form of the drug prescribed:

- Many drug are available in more than one dosage forms e.g. liquid, tablets, injections or suppositories.
- The dosage form intended for the patient must be mentioned in the prescription to reduce ambiguity

5) Dose:

- If unusually high or low dose is mentioned in the prescription then it must be consulted with the prescriber.
- Sometimes a sustained release (SR) dosage form is prescribed thrice or more times daily. Actually SR dosage forms should be given once or twice a day

6) Instructions to the patient:

- The route of administration should be mentioned clearly

7) Incompatibilities:

- It is essential to check that there is no pharmaceutical or therapeutic incompatibilities in the prescription.
- If more than two medicines are prescribed then it is the duty of the pharmacist to see whether their **interactions** will produce any harm to the patient or not.
- Certain drugs has interactions with **food**.
- The pharmacist has to advise the patient about it. E..g, Tetracycline should not be taken with **milk or antacid**

Care Required in Dispensing Prescription

- The prescription must be carried with the pharmacist while taking the medicine out of the shelves. It will constantly remind the **name** and **strength** of the preparation required.
- The dispensing balance should always be checked before weighing any ingredient.
- All the **chemicals and stock** preparations should be replaced back in to their original positions in the shelf.
- While pouring or measuring a **liquid** ingredient care must be taken to prevent surplus liquid running down of the bottle and staining the label.

- Care should be taken to keep the **balance clean** after each measurement. The powders should be transferred by a **clean spatula**.

- Liquid preparations for external use should be supplied in a fluted bottle and the label must display **“FOR EXTERNAL USE ONLY ”** in red ink.

- Before handing over the medicine to the patient, again the **preparation** should be checked that the correct preparation, in the correct **strength**, has been supplied and the correct direction has been stated on the label.

Labeling of Dispensed Medicines

- After dispensing the medicine in a container, a label is attached by **adhesive**.
- The label on the dispensed medicines should provide the following information

1. Name of the preparation

- When the prescriber mentions the name in the prescription the same name must be displayed on the label
- e.g. Piperazine citrate elixir IP
- If it is a non-official preparation then the name of the dosage form should be given on the label
- e.g. The mixture, the emulsion, the dusting powder

2. Strength of the medicine

- The strength of the active ingredient in the preparation must be displayed if it is intended for internal (oral) purpose.
- The amount in each unit of dose should be mentioned.
- e.g. In case of oral liquids “Each 5 ml contains 250 mg”
- e.g. In case of tablet “Each tablet contains 500 mg”.
- The values must be written in whole numbers and if decimal is not avoidable then a zero is placed before the decimal point.
- E.g. instead of 0.1 g it should be 100 mg, and instead of .5% it should be 0.5%.
- In case of an official preparation the strength is not required to be given, because the name with reference to the pharmacopoeia is sufficient.
- E.g. Chloramphenicol oral suspension IP.

3. Quantity supplied in the container

- The total quantity of the product dispensed in the container should be indicated on the label. E.g. 50 ml, 4 tabs etc.

4. Storage conditions and shelf life (expiry date) of the product

- ✓ **Temperature:** Many preparations are required to be kept below 15°C. In these cases the label should indicate KEEP IN A COOL PLACE.
- Suppositories and pessaries melts at 37°C so the label should indicate KEEP IN A COOL PLACE.
- Insulin injections should be stored at 2-8°C so the label should indicate KEEP IN REFRIGERATOR.
- ✓ **Humidity:** Powders, tablets and capsules should be stored in an air-tight container. The label should indicate KEEP THE BOTTLE TIGHTLY CLOSED.
- ✓ **Light:** Drugs those degrade in presence of light should be stored in dark place. The label should indicate KEEP IN A DARK PLACE.

5. Instructions to the patient

(a) Directions

The directions are normally written by the prescriber. These include

- ✓ the quantity to be taken
- ✓ the frequency or timing of administration
- ✓ the route of administration
- ✓ or the method of use

The phrases used are generally ‘to be taken’, ‘to be given’, or ‘to be used’. e.g. One tablet to be taken thrice daily after meal.

(b) Warning label:

For external use only	Topical preparations like ointment, pastes, dusting powders etc.
Drowsiness warning	Drug may cause drowsiness: Don't drive car or operate machinery
Drug Interaction	i) Drugs in which absorption improves if taken before food: *Warning*: To be taken an hour before meal or in empty stomach. ii) Drugs causing GIT irritation (*Warning*: Taken with/ after meal) iii) In case of metronidazole (*Warning*: Avoid alcoholic drink)
Interactions with other medicine	Tetracycline complexes with Ca, Fe, Mg and inhibits its absorption. (Do not take milk, Fe preparation or antacids)
Methods of administration	i) Drug required to be dissolved in mouth: To be sucked/ chewed. ii) Oral powders or granules are required to be dissolved in water before taking iii) Drugs causing GIT irritation: (To be taken with plenty of water)
Cautions	i) Photosensitized preparation: Avoid exposure of skin to direct sunlight ii) Preparation produce unusual effect: May color urine or stool iii) Keep inflammable preparation away from naked flame

Special Instructions

Application	*For external use only.*
Capsules	*Swallow with a draught of water.*
Creams	*For external use only. Keep in a cool place.*
Dusting powder	*For external use only. Don't applied to open wounds/weeping surfaces*
Ear drops	*For external use only.*
Emulsions	*Shake the bottle before use.*
Enemas	*For rectal use only. Warm to body temperature before use.*
Eye drops	*To be used within 30 days after first opening.*
Gargles, mouthwash	*Not to be swallowed in large amount.*
Linctuses	*To be sipped and swallowed slowly without addition of water.*
Liniments and lotions	*For external use only. Shake the bottle before use.* *Do not apply on broken skin.* (Because it will produce irritation)
Mixtures	*Shake well before use.*
Nasal drops	*For nasal use only*
Ointments, Pastes & Paints	*For external use only.*
Pessaries	*For vaginal use only*
Suppositories	*For rectal use only. Store in a cool place.*

Latin Terms, Abbreviations, English Translation

Latin term	Abbreviation	English Translation
Quantum sufficiat Quantum sufficit Quantitatem sufficientem	q.s.	As much as is sufficient.
Ad	ad	Upto
Ad libitum	ad lib	As needed
Agita	agit	Shake
Alternis horis	alt hr	Alternate hour
Ana	aa	Each
Ante cibos	ac	Before meals
Aqua destillate	aq dest	Distilled water
Capiat	cap	Take
Charta	chart	Paper
Cochleare amplum	coch amp	Tablespoonful
Cochleare magnum	coch mag	Tablespoonful

Dosage Forms

Latin term	Abbreviation	English Translation
Auristillae	auristill.	Ear drops
Capsula	caps.	A Capsule
Charta	chart.	A powder
Collunarium	collun.	A nose wash
Collutorium	collut.	A mouth wash
Collyrium	collyr.	An eye lotion
Cremor	crem.	Cream
Gargarisma	garg.	A gargle
Gelatina	gelat.	A jelly
Guttae	gtt.	Drops
Haustus	ht.	A draught
Inhalatio	inhal.	An inhalation
Injectio	inj.	An injection
Insufflatio	insuff.	An insufflation

Latin term	Abbreviation	English Translation
Linctus	linct.	A linctus
Linimentum	lin.	A liniment
Liqor	liq.	A solution
Lotio	lot.	A lotion
Mistura	mist., m.	A mixture
Naristillae	narist.	Nasal drops
Nebula	neb.	A spray solution
Pasta	past.	A paste
Pignemtum	pigm.	A paint
Pulvis	pulv.	A powder, dusting powder
Tabella	tab.	A tablet
Unguentum	ung.	An ointment
Misce	mix	Mix
Mane	man	Morning
Liquor	liq	Solution

Instruction related to preparation

Latin term	Abbreviation	English Translation
Fiat	ft.	Let (it) be made
Misce	m.	Let (it) be mixed
Misce fiat mistura	m.ft.m.	Mix to make a mixture
Solve		Dissolve
Quantitum rectum	qr	Correct quantity
Quaque nocte	qn	Every night
Quaque mane	qm	Every morning
Quaque die	qd	Every day
Pulvis	pulv	Powder
Pro re nata	P r n	When needed
Post cibos	p c	After meal
Per os	p o	Orally
Omni	Omn	Every
More dictu	more dict	As directed

Quantity to be sent and the manner of sending

Latin term	Abbreviation	English Translation
Duplum	duplum	Twice the quantity
In phiala		In a bottle
Mitte	mitt.	Send
Phiala prius agitata	p.p.a.	Shake the bottle
Talis, Tales, Talia	tal.	Such
Semi	ss	Half
Signa	sig	Write
Sine	s	Without
Si opus sit	sos	When need arises
Statim	stat	Immediately
Uuguentum	ung	Ointment
Ut dictum	ut dict	As directed
Secundum artem	sa	According to art
Recipe	Rx	You take

Method of Administration

Latin term	Abbreviation	English Translation
Addendus	addend.	To be added
Applicandus	applicand.	To be applied
Applicat		Let (him/her) apply
Capiendus	capiend.	To be taken
Dandus	dand.	To be given
Deglutiendus	deglut.	To be swallowed
Infraicandus	infricand.	To be rubbed in
Miscendus	miscend.	To be mixed
Signa	sig.	Label
Sumendus	sum. or s.	To be taken
Ut antea	u.a.	As before
Utendus	u. or utend.	To be used

Time of Administration or Application

Latin term	Abbreviation	English Translation
Semel in die	sem. in die, OD	Once a day
Bis in die, Bis die	b.i.d. or b.d.	Twice a day
Ter in die, Ter die	t.i.d. or t.d.	Thrice a day
Quartar in die	q.i.d., q.d.	Four times a day
Hora somni	h s	Bed time
Gutta	gtt	Drop
Fiat	ft	Make
Ex modo prescripto	e m p	In the prescribed manner
Denture tales doses	d t d	Give of such doses
Cum	c	With
Cochleare parvum	coch parv	Teaspoonful