Interpretation of the Prescription or Medication Order

處方或給藥方案解釋

Objectives

Upon successful completion of this chapter, the student will be able to:

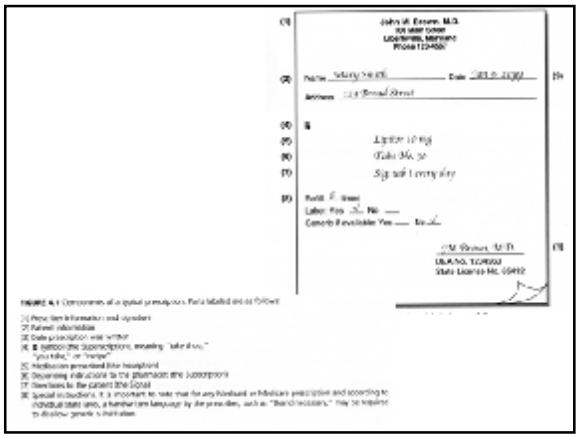
- Demonstrate an understanding of the format and components of a typical prescription.
- Demonstrate an understanding of the format and components of a typical institutional medication order.
- Interpret correctly standard abbreviations and symbols used on prescriptions and medication orders.
- Differentiate between patient compliance and noncompliance and apply calculations to determine compliancy.

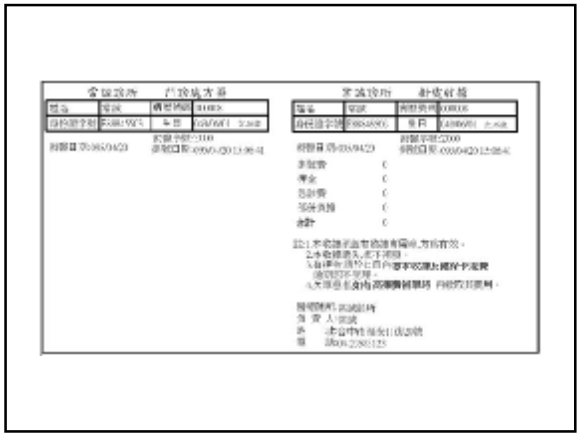
Prescription

- is an **order** for medication issued by a **physician, dentist**, or other **properly licensed medical practitioner**.
- designate a **specific medication** and **dosage** to be prepared by a pharmacist.
- are usually written on **preprinted forms** containing the traditional symbol "R" (meaning "**recipe**," "**take thou**," or "**you take**"), **name**, **address**, **telephone number**, and other information regarding the physician or other prescriber.

Prescription

- **blank spaces** are used by the prescriber to provide information about:
  - the patient,
  - the **medication desired**,
  - the **directions for use**.
- written by **veterinarians** generally include the **animal species** and/or **pet's name** and the **name of the owner**.
- A completed prescription is shown in Figure 4.1.





- prescription orders(給藥方案):
  - are frequently received by the pharmacist by **telephone** or by **direct communication**.
  - the pharmacist immediately reduces the order to a properly written form or computer entry.
- In hospitals and other institutions, the forms are somewhat different and are referred to as medication orders.
  - A typical medication order sheet is shown in Figure 4.2.
    - The orders shown in this example are typed;
    - these instructions are written by the physician in ink.


CITY HOSPITAL
Athens, GA 30608

PATIENT NAME: Thompson, Linda
ADDRESS: 2345 Oak Circle
CITY, STATE: Athens, GA
AGE/SEX: 35 Female
PHYSICIAN: ...Hardner
HOSP.NO: 90612345
SERVICE: Medicine
ROOM: 220 East

PHYSICIAN'S ORDERS

DATE	TIME	ORDERS
10/01/yy	1200	1. Propranolol 40 mg po qid
		2. Furosemide 20 mg po q AM
		3. Phenytoin 200 mg at HS pre sleep
		4. D-5-W + 20 mEq KCl/L at 81 ml/hr
		Hardner, MD

Unless "No substitution permitted" is clearly written after the order, a generic or therapeutic equivalent drug may be dispensed according to the Formulary policies of this hospital.

- Prescriptions and medication orders written for **infants**, **children**, and sometimes the **elderly** may also include the **age**, **weight**, and/or **body surface area (BSA)** of the patient (described in Chapter 8).
  - This information is sometimes necessary in **calculating the appropriate medication dosage.**

- Two broad categories of prescriptions:
  1. for a **single component** or prefabricated product and **not requiring compounding or admixture by the pharmacist**,
  2. for **more than a single component and requiring compounding**.
- **Prescriptions** may include the **chemical** or nonproprietary (**generic) name** of the substance or the **manufacturer's brand or trademark name** (shown capitalized in this text).
- Prescriptions requiring compounding contain the quantities of each ingredient required.

- **Medications** are prepared into various types of **dosage forms** (e.g., **tablets, syrups, injections**) and **drug delivery systems** (e.g., transdermal patches) to ensure that the medication is administered accurately and appropriately.
- The **extemporaneous compounding** of prescriptions is an activity for which pharmacists are uniquely qualified by virtue of their **education, training, and experience.**

Examples are shown for Prescriptions calling for:

- trade-name product: Fig. 4.1 and Fig. 4.3
- A generic drug: Fig. 4.4
- Compounding: Fig. 4.5

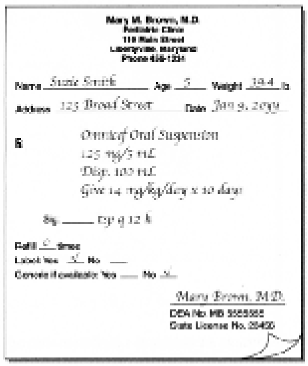

Mary M. Brown, M.D.
Pediatric Clinic
Liberyville, Maryland
Name Susie Smith Age 5 Weight 39.4 lb
Address 123 Broad Street Date Jan 9, 2099
℞ Omnicef Oral Suspension
125 mg/5 mL
Disp. 100 mL
Give 14 mg/kg/day x 10 days
Sig. ___ tsp q 12 h
Refill 0 times
Label Yes ✓ No ___
Generic if available: Yes ___ No ✓
Mary Brown, M.D.
DEA No. MB 5555555
State License No. 20450

FIGURE 4.3 Example of a prescription for a pediatric patient.


John M. Brown, M.D.
Liberyville, Maryland
Name Fred Smith Date Jan 9, 2099
Address 123 Broad Street
RX 1234578
℞ Amoxicillin 250 mg/5 mL
Disp. 100 mL
Sig: two tsp. every 12 hours until gone
Refill 0 times
Label Yes ✓ No ___
Generic if available: Yes ___ No ___
JM Brown, M.D.
DEA No. 1234563
State License No. 05482

FIGURE 4.4 Example of a prescription written for a generic drug.

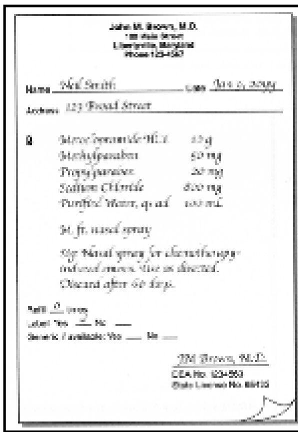

John M. Brown, M.D.
Liberyville, Maryland
Name Ned Smith Date Jan 9, 2099
Address 123 Broad Street
℞ Methylparaben 50 mg
Propylparaben 20 mg
Sodium Chloride 800 mg
Purified Water, q.s. ad 100 mL
M. ft. nasal spray
Sig: Nasal spray for chemotherapy-induced emesis. Use as directed.
Discard after 60 days.
Refill 0 times
Label Yes ✓ No ___
Generic if available: Yes ___ No ___
JM Brown, M.D.

FIGURE 4.5 Example of a prescription requiring compounding.

2011/9/30

Hospital and other institutional medication order forms

FIGURE 4.6 Example of a hospital form for prescribing a specific drug treatment: Patient-Controlled Anesthesia (Adapted with permission from www.hospitalnurse.com.)

MEDICATION ORDER FORM
CITY NURSING HOME
Physician's Orders

Attending Physician: Order Number: (preprinted)

Resident's Name: Room Number:

DRUG	QUANTITY	DOSE AND ROUTE	FREQUENCY	DIAGNOSIS	ADMINISTRATION TIMES
1.					___AM ___PM ___AM ___PM
2.					___AM ___PM ___AM ___PM
3.					___AM ___PM ___AM ___PM
4.					___AM ___PM ___AM ___PM

Physician's Signature: Time/Date Ordered:

Signature of Nurse Receiving Order: Time/Date Ordered:

Ordered from Pharmacy, Time/Date: Received from Pharmacy, Time/Date:

FIGURE 4.7 Example of a nursing home medication order form.

TABLE 4.1 COMPARATIVE EXPRESSIONS OF REGULAR AND MILITARY TIME

REGULAR TIME	MILITARY TIME	REGULAR TIME	MILITARY TIME
Midnight	0000	Noon	1200
1:00 A.M.	0100	1:00 P.M.	1300
2:00 A.M.	0200	2:00 P.M.	1400
3:00 A.M.	0300	3:00 P.M.	1500
4:00 A.M.	0400	4:00 P.M.	1600
5:00 A.M.	0500	5:00 P.M.	1700
6:00 A.M.	0600	6:00 P.M.	1800
7:00 A.M.	0700	7:00 P.M.	1900
8:00 A.M.	0800	8:00 P.M.	2000
9:00 A.M.	0900	9:00 P.M.	2100
10:00 A.M.	1000	10:00 P.M.	2200
11:00 A.M.	1100	11:00 P.M.	2300

Range of prescription and medication order calculations

- *Doses:* including
  - the quantity of a prescribed dose,
  - the total number of doses prescribed,
  - the number of days the prescribed medication will last.
- *Compliance:* the patient's or caregiver's compliance in meeting the prescribed directions for dosing.

Range of prescription and medication order calculations

- Drug *concentration:* the quantity of an active therapeutic ingredient to use to achieve the desired drug concentration.
- *Rate of drug administration:*
  - the quantity of drug administered per unit of time to meet prescribed dosing schedule (e.g., mg/min, drops/minute, or mL/hr for the administration of an intravenous fluid).

Range of prescription and medication order calculations

- *Compounding:*
  - the quantities of active and inactive components to use in the extemporaneous preparation of a pharmaceutical product,
  - including the use of stock solutions and/or prefabricated dosage units in the process.
- *Chemical-physical* factors: including calculations to make solutions isotonic, isoosmotic, equimolar, or buffered.

Range of prescription and medication order calculations

- *Pharmacoeconomics:* including
  - medication costs,
  - cost-benefit analysis,
  - cost-effectiveness analysis,
  - alternative treatment plans,
  - medication pricing.

- The quantities of ingredients to be used almost always are expressed in the **metric system** of weights and measures.
  - the decimal point may be replaced by a **vertical line** that is imprinted on the prescription blank or hand-drawn by the prescriber.
  - whole or subunits of grams of weight and milliliters of volume are separated by the vertical line.
  - Sometimes the **abbreviations g (for gram) and mL (for milliliter) are absent and must be presumed**.
- units of the **apothecaries' system** may be used.
  - This system is described in Appendix A.

Examples of prescriptions written in the **metric system**

- Acetylsalicylic Acid 4.0 g
- Phenacetin 0.8 g
- Codeine Sulface 0.5 g

Mix and make capsules no. 20
Sig. One capsule every 4 hours.

Dextromethorphan	0	18
Guaifenesin Syrup	1	2
Alcohol	2	1
Flavored Syrup ad	60	0

Sig. 5 mL as needed for cough.

Prescription and medication order accuracy

- is the responsibility of the pharmacist to ensure that each prescription and medication order received is correct in its form and content;
- is appropriate for the patient being treated;
- is subsequently filled, labeled, dispensed, and administered accurately.

In essence, each medication should be:

- therapeutically appropriate for the patient;
- prescribed at the correct dose;
- dispensed in the correct strength and dosage form;
- correctly labeled with complete instructions for the patient or caregiver;
- for the patient in a hospital or other health care facility, each medication must be administered to the correct patient, at the correct time, and by the correct rate and route of administration.

Prescription and medication order accuracy

- therapeutically appropriate for the patient;
- prescribed at the correct dose;
- dispensed in the correct strength and dosage form;
- correctly labeled with complete instructions for the patient or caregiver; and
- for the patient in a hospital or other health care facility, each medication must be administered to the correct patient, at the correct time, and by the correct rate and route of administration.

FIGURE 4.8 Example of a Pharmaceutical Bar Code used in hospitals and other health-care settings for positive drug identification to reduce medication errors. (Courtesy of Baxter Healthcare Corporation.)

- search for errors *and* omissions:
  - the pharmacist reviews each prescription and medication order in a step-by-step manner to detect errors of omission and commission.
    - is an important initial *step* in the process of ensuring accuracy.
- Other subsequent and related parameters to ensure the accuracy of medication use—
  - the application of pharmacotherapeutics,
  - disease state management,
  - the legal and regulatory aspects of drugs and prescribing.

items that the pharmacist should check for the correct reading and interpretation of a prescription or medication order

- prescriber information, including
  - address and telephone number,
  - Drug Enforcement Administration (DEA) number (for authority to prescribe schedule drugs including narcotics),
  - state license number and signature;
- date of the order and its currency to the request for filling;
- patient information, including
  - dose-relevant information, such as the age and/or weight of the patient if the dose of the drug is so based;

items that the pharmacist should check for the correct reading and interpretation of a prescription or medication order

- drug prescribed, including
  - dose, preparation strength, dosage form, and quantity;
- clarity of any abbreviations, symbols, and/or units of measure;
- clarity and completeness of directions for use by the patient or caregiver;
- refill and/or generic substitution authorization;

items that the pharmacist should check for the correct reading and interpretation of a prescription or medication order

- need for special labeling, such as expiration date, conditions for storage, and foods and/or other medications not to take concomitantly;
- a listing of the ingredients and quantities for orders to be compounded;
- calculations performed should be checked and double-checked, as should the positive identification of all ingredients used along with their measurements.

Before dispensing, the pharmacist should make certain of the following:

- The filled prescription or medication order contains the correct drug, strength, dosage form, and quantity.
- The bar-coding of pharmaceutical products used in hospital settings is required by the federal Food and Drug Administration (FDA) as an added protection to ensure accurate product dispensing and administration (see Fig. 4.6).
- The pharmacy-imprinted serial number on the label matches that on the order.

Before dispensing, the pharmacist should make certain of the following:

- The label has the name of the correct patient and physician; the correct drug name, quantity, and strength; the name or initials of the pharmacist who filled the order; and the number of refills remaining.
- Additional label information and/or auxiliary labels may be required according to good pharmacy practice and by federal and state law depending on the drug dispensed.

- pharmacy compounding involves:
  - the **mixing, assembling, packaging, and labeling of a medication** on receipt of a prescription order for a specific patient.
- guidelines of the **Food and Drug Administration** permit the **advance preparation of small quantities of compound products** in anticipation of prescriptions for patients, based on regularly observed prescribing patterns.
- Unless licensed as a manufacturer, pharmacies may not engage in the large-scale production or manufacturing of drugs for other pharmacies or for other entities for distribution or resale.

Example:

Refer to the prescription shown in Figure 4.1 to identify any errors and/or omissions in the following prescription label.

Main Street Pharmacy
150 Main Street
Libertyville, Maryland
Phone 456-1432

Rx 1234575 Jan 10, 20yy
Brad Smith Dr. J. M. Brown

Take 2 teaspoonfuls every 12 hours.

Ampicillin 250 mg/5 mL 100 mL
Refills: 0 Pharmacist: AS

Error: Drug name incorrect.
Omission: Directions incomplete.

Use of Roman Numerals on Prescriptions

Roman numerals commonly are used in prescription writing to designate quantities, as the: (1) quantity of medication to be dispensed and/or (2) quantity of medication to be taken by the patient per dose.

The student may recall the eight letters of fixed values used in the Roman system:

ss	=	½	L or l	=	50
I, or i	=	1	C or c	=	100
V or v	=	5	D or d	=	500
X or x	=	10	M or m	=	1000

The student also may recall that the following rules apply in the use of Roman numerals:

1. A letter repeated once or more, repeats its value (e.g., xx = 20; xxx = 30).
2. One or more letters placed after a letter of greater value increases the value of the greater letter (e.g., vi = 6; xij = 12; lx = 60).
3. A letter placed before a letter of greater value decreases the value of the greater letter (e.g., iv = 4; xl = 40).

Use of abbreviations and symbols

- is common on **prescriptions** and **medication orders**.
  - Some are derived from the **Latin** through its **historic use in medicine and pharmacy**,
  - others have evolved through preservers' use of **writing shortcuts**.
- A list of some of these abbreviations is presented in **Table 4.2**.

Use of abbreviations and symbols

- *A whole number should be shown without a decimal point and without a terminal zero (e.g., express 4 milligrams as 4 mg and not as 4.0 mg).*
- *A quantity smaller than one should be shown with a zero preceding the decimal point (e.g., express two tenths of a milligram as 0.2 mg and not as .2 mg).*
- *Leave a space between a number and the unit (e.g., 10 mg and not 10mg).*
- *Use whole numbers when possible and not equivalent decimal fractions (e.g., use 100 mg and not 0.1 g).*
- *Use the full names of drugs and not abbreviations (e.g., use phenobarbital and not PB).*
- *Use USP designations for units of measure (e.g., for grams, use g and not Gm or gm; for milligrams, use mg and not mgs or mgm).*
- *Spell out "units" (e.g., use 150 units and not 150 u or 150 U since an illegible U may be misread as a zero, resulting in a 10-fold error, i.e., 1000). The abbreviation I.U., which stands for "International Units," should also be spelled out so it is not interpreted as I.V., meaning "intravenous."*

Use of abbreviations and symbols

- *Certain abbreviations that could be mistaken for other abbreviations should be written out (e.g., write "right eye" or "left eye" rather than use o.d. or o.l., and spell out "right ear" and "left ear" rather than use a.d. or a.l.)*
- *Spell out "every day" rather than use q.d.; "every other day," rather than q.o.d, and "four times a day," rather than q.i.d to avoid misinterpretation.*
- *Avoid using d for "day" or "dose" because of the profound difference between terms, as in mg/kg/day versus mg/kg/dose.*
- *Integrate capital or "tall man" letters to distinguish between "look alike" drug names, such as AggreSTAT and AggreNOX; hydrOXYZINE and hydrALAZINE; and DIGoxin and DESoxyn.*
- *Amplify the prescriber's directions on the prescription label when needed for clarity (e.g., use "Swallow one (1) capsule with water in the morning" rather than "one cap in a.m.").*

TABLE 4.2 SELECTED ABBREVIATIONS, ACRONYMS, AND SYMBOLS USED IN PRESCRIPTIONS AND MEDICATION ORDERS[a,b]

ABBREVIATION (LATIN ORIGIN[c])	MEANING
Prescription Filling Directions	
aa. or (ana)	of each
ad (ad)	up to; to make
disp. (dispensatur)	dispense
div. (dividatur)	divide
d.t.d. (dentur tales doses)	give of such doses
ft (fiat)	make
M. (misce)	mix
No. (numero)	number
non rep. or NR (non repetatur)	do not repeat
q.s. (quantum sufficit)	a sufficient quantity
q.s. ad (quantum sufficiat ad)	a sufficient quantity to make
Sig. (Signa)	write (directions on label)

ABBREVIATION (LATIN ORIGIN[c])	MEANING
pt.	pint
qt.	quart
ss or $\overline{ss}$ (semissem)	one half
tbsp.	tablespoonful
tsp.	teaspoonful
Signa/Patient Instructions	
a.c. (ante cibos)	before meals
ad lib. (ad libitum)	at pleasure, freely
admin	administer
A.M. (ante meridiem)	morning
aq. (aqua)	water
ATC	around the clock
b.i.d. (bis in die)	twice a day
c̄ or c̄ (cum)	with
d (die)	day
dil. (dilutus)	dilute
et	and

TABLE 4.2 SELECTED ABBREVIATIONS, ACRONYMS, AND SYMBOLS USED IN PRESCRIPTIONS AND MEDICATION ORDERS[a,b]

ABBREVIATION (LATIN ORIGIN[c])	MEANING
Quantities and Measurement	
BSA	body surface area
cm^3	cubic centimeter or milliliter (mL)
f or ƒ (fluidus)	fluid
fʒ or ʒ	fluid dram (≈ teaspoonful, 5 mL)
f℥ss or ℥ss	half-fluidounce (≈ tablespoonful, 15 mL)
g	gram
gal	gallon
gtt (gutta)	drop
lb (libra)	pound
kg	kilogram
L	liter
m^2 or M^2	square meter
mcg	microgram
mEq	milliequivalent
mg	milligram
mg/kg	milligrams (of drug) per kilogram (of body weight)
mg/m^2	milligrams (of drug) per square meter (of body surface area)
mL	milliliter
mL/h	milliliters (of drug administered) per hour (as through intravenous administration)
mOsm or mOsmol	milliosmoles
oz.	ounce

ABBREVIATION (LATIN ORIGIN[c])	MEANING
h. or hr. (hora)	hour
h.s. (hora somni)	at bedtime
i.c. (inter cibos)	between meals
min. (minutum)	minute
m&n	morning and night
N&V	nausea and vomiting
noct. (noctis)	night
NPO (non per os)	nothing by mouth
p.c. (post cibos)	after meals
P.M. (post meridiem)	afternoon; evening
p.o. (per os)	by mouth (orally)
p.r.n. (pro re nata)	as needed
q (quaque)	every
qAM	every morning
q4h, q8h, etc.	every ... hours
q.i.d. (quater in die)	four times a day
rep. (repetatur)	repeat
s (sine)	without
s.i.d. (semel in die)	once a day
s.o.s. (si opus sit)	if there is need; as needed
stat. (statim)	immediately
t.i.d. (ter in die)	three times a day
ut dict. (ut dictum)	as directed
wk.	week
Medications	
APAP	acetaminophen
ASA	aspirin
AZT	zidovudine

TABLE 4.2 *Continued*

ABBREVIATION (LATIN ORIGIN[c])	MEANING
EES	erythromycin ethylsuccinate
HC	hydrocortisone
HCTZ	hydrochlorothiazide
MTX	methotrexate
NTG	nitroglycerin
Clinical	
BM	bowel movement
BP	blood pressure
BS	blood sugar
CHD	coronary heart disease
CHF	congestive heart failure
GERD	gastrointestinal reflux disease
GI	gastrointestinal
GFR	glomerular filtration rate
GU	genitourinary
HA	headache
HBP	high blood pressure
HRT	hormone replacement therapy

ABBREVIATION (LATIN ORIGIN[c])	MEANING
D5NS	dextrose 5% in normal saline (0.9% sodium chloride)
D5W	dextrose 5% in water
D10W	dextrose 10% in water
elix.	elixir
inj.	injection
NS	normal saline
½NS	half-strength normal saline
oint or ungt. (unguentum)	ointment
pulv. (pulvis)	powder
RL, R/L or LR	Ringer's Lactate or Lactated Ringer's
sol. (solutio)	solution
supp. (suppositorium)	suppository
susp.	suspension
syr. (syrupus)	syrup
tab. (tabletta)	tablet

TABLE 4.2 Continued

ABBREVIATION (LATIN ORIGIN)*	MEANING	ABBREVIATION (LATIN ORIGIN)*	MEANING
HT or HTN	hypertension	**Routes of Administration**	
ICP	intraocular pressure	CIVI	continuous (24 hour) intravenous infusion
MI	myocardial ischemia/ infarction	ID	intradermal
OA	osteoarthritis	IM	intramuscular
Pt	patient	IT	intrathecal
SOB	shortness of breath	IV	intravenous
TPN	total parenteral nutrition	IVB	intravenous bolus
URI	upper respiratory infection	IV Drip	intravenous infusion
UTI	urinary tract infection	IVP	intravenous push
Dosage Forms/Vehicles		IVPB	intravenous piggy back
amp	ampul	NGT	nasogastric tube
cap	capsule	p.o. or PO (per os)	by mouth
D5LR	dextrose 5% in lactated Ringer's	rect	rectal or rectum
		SL	sublingual
		SubQ	subcutaneously
		Top.	topically
		V or PV	vaginally

* The abbreviations set in **boldface type** are considered most likely to appear on prescriptions. It is suggested that these be learned first.

† In practice, periods and/or capital letters may or may not be used with the abbreviations. Since abbreviations, acronyms, and symbols have medication-error risks associated with their use, therefore, the Institute for Safe Medication Practices (ISMP) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) have issued a list of items prohibited from use and others considered for prohibition (see text).‡ These designated items are not included in Table 4.2, with the exception of cc, qod, AZT, and HCTZ which are included for instructional purpose due to their remaining use in practice.

‡ Muldoon MC. Pharmaceutical Latin. 4th Ed. New York: John Wiley & Sons; 1993.

Use of **abbreviations and symbols**

- **medication errors** can result from:
  - the **misuse, misinterpretation**, and **illegible writing** of abbreviations,
  - the use of **ad hoc** (特別地) or **made-up (虛構) abbreviations**.
- Help **reduce medication errors:**
  - The **use of a controlled vocabulary**,
  - a **reduction in the use of abbreviations**,
  - **care in the writing of decimal points**,
  - the **proper use of leading and terminal zeros**.
- A **misplaced** or **misread decimal point** represents a minimum of a **ten- fold error**.

Specific recommendations to help reduce medication errors

- A **whole number** should be shown without a decimal point and without a terminal zero (e.g., express four milligrams as **4 mg** and not as **4.0** mg).
- A **quantity smaller than one** should be shown with a **zero preceding the decimal point** (e.g., express two-tenths of a milligram as **0.2 mg** and not as **.2 mg**).
- **Leave a space between a number and the unit** (e.g., **10 mg** and not **10mg**).

Specific recommendations to help reduce medication errors

- **Use whole numbers when possible** and not equivalent decimal fractions (e.g., use **100 mg** and not **0.1 g**).
- **Use the full names of drugs and not abbreviations** (e.g., use **phenobarbital** and not **PB**).
- **Use USP designations for units** of measure (e.g., for **grams**, use **g** and not Gm or gms; for **milligrams**, use **mg** and not mgs or mgm).

Specific recommendations to help reduce medication errors

- **Spell out "units"** (e.g., use **100 units** and not 100 u or 100 U since an illegible "**U" may he misread as a zero** resulting in a tenfold error).
- Certain abbreviations which may be mistaken for other abbreviations should be written out (e.g., write "**right eye**" or "**left eye**" rather than use o**.d**. or **o.l**.).
- Amplify the preserver's directions on the prescription label when needed for clarity (e.g., use "**Swallow one (1) capsule with water in the morning**" rather than "**one cap in a.m**.").

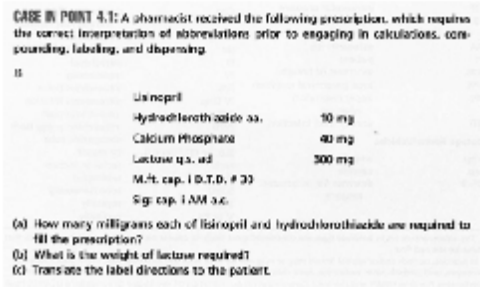
- The portions of the prescription presenting directions to the ***pharmacist (the Subscription***)
- The ***directions to the patient (the Signa***) commonly contain abbreviated forms of ***English or Latin*** terms as well as **Arabic and Roman numerals**.
- The correct interpretation of these abbreviations and prescription notations plays an important part in ***pharmaceutical calculations*** and thus in the ***accurate filling and dispensing of medication***.

Examples of Prescription ***Directions to the Pharmacist***

1. **M**. **ft**. **ungt**.
   Mix and **make** an **ointment**.
2. **Ft**. **supp**. no **xii**
   Make 12 suppositories.
3. M. ft. cap. d.t.d. no. xxiv
   Mix and make capsules. Give 24 such doses.

Examples of Prescription ***Directions to the Patient***

1. **Caps. i. q.i.d. p.c. et h.s**.
   - Take one (1) capsule four (4) times a day after each meal and at bedtime.
2. **gtt, ii o.d. q.d. a.m.**
   - Instill two (2) drops in the right eye every day in the morning.
3. **tab. ii stat tab. 1 q. 6 h. X 7 d.**
   - Take two (2) tablets immediately, then take one (1) tablet every 6 hours for 7 days.



CASE IN POINT 4.1: A pharmacist received the following prescription, which requires the correct interpretation of abbreviations prior to engaging in calculations, compounding, labeling, and dispensing.

℞

Lisinopril	
Hydrochlorothiazide aa.	10 mg
Calcium Phosphate	40 mg
Lactose q.s. ad	300 mg

M.ft. cap. I B.T.D. # 30

Sig: cap. I AM a.c.

(a) How many milligrams each of lisinopril and hydrochlorothiazide are required to fill the prescription?
(b) What is the weight of lactose required?
(c) Translate the label directions to the patient.

(a) 30*10=300 mg

(b) 300-60=240, 240*30=7200 mg

(c) Eat one cap. before meal in the morning.

MEDICATION SCHEDULING AND PATIENT COMPLIANCE

- **Medication scheduling**:
  - may be defined as the **frequency** (i.e., times per day) and d**uration** (i.e., length of treatment) of a drug's prescribed or recommended use.
- Some medications, because of their physical, chemical, or biological characteristics or their dosage formulation, may be taken just **once daily** for optimum benefit, whereas other drug products must be taken **two, three, four, or more times daily** for the desired effect.

MEDICATION SCHEDULING AND PATIENT COMPLIANCE

- **Frequency of medication scheduling** is also influenced by the **patient's physical condition** and the **nature and severity of the illness** or **condition** being treated.
  - **Indigestion**: may require a single dose of medication for correction.
  - a **systemic infection**: may require multiple daily, around-the-clock (日以繼夜地) dosing for 10 days or more.
  - Long- term maintenance therapy for such conditions as **diabetes** and **high blood pressure** may require **daily dosing** for life.

- For optimum benefit from **prescribed therapy** or from the use of **over-the-counter (nonprescription) medications**, it is incumbent on the patient to adhere to the recommended medication schedule.
- **Patient compliance** with prescribed and nonprescribed medications:
  - is defined as patient **understanding and adherence to the directions for use**.
  - The compliant patient follows the label directions for taking the medication properly and adheres to any special instructions provided by the prescriber and/or pharmacist.

- **Compliance** includes **taking medication** :
  - at the desired strength,
  - in the proper dosage form,
  - at the appropriate time of day and night,
  - at the proper interval for the duration of the treatment,
  - with proper regard to food and drink and consideration of other concomitant medications (both prescribed or nonprescribed) and herbal remedies.

- **Patient noncompliance** is the failure to comply with a practitioner's or labeled direction in the self-administration of any medication.
- **Noncompliance** involved:
  - underdosage or overdosage,
  - inconsistent or sporadic dosing,
  - incorrect duration of treatment,
  - drug abuse or misadventuring with medications.

- **Factors of patient noncompliance**
  - unclear or misunderstood directions,
  - undesired side effects of the drug that discourage use,
  - lack of patient confidence in the drug and/or prescriber,
  - discontinued use because the patient feels better or worse,
  - economic reasons based on the cost of the medication,
  - absence of patient counseling and understanding of the need for and means of compliance,
  - confusion over taking multiple medications.

- **patients forget whether or not they have taken their medications**.
  - who are **easily confused**,
  - who have **memory failure**,
  - who are taking **multiple medications scheduled to be taken at different times** during the day or night.
- **Special compliance aids**:
  - medication calendars,
  - reminder charts,
  - special containers.

- **Patient noncompliance** is **not entirely** the problem of **ambulatory** or **non-institurionalized patients**.
- Patients in **hospitals**, **nursing homes**, and other **inpatient settings** are generally more **compliant** because of the efforts of health care personnel who are assigned the responsibility of issuing and administering medication on a **prescribed schedule**.
  - a scheduled dose of medication may be omitted or administered incorrectly or in an untimely fashion because of **human error or oversight**.

- The ***consequences of patient noncompliance***:
  - worsening of the condition,
  - the requirement of additional and perhaps more expensive and extensive treatment methods or surgical procedures,
  - unnecessary hospitalization,
  - increased total health care cost.
- Some of the different types of problems relating to patient compliance with medication are exemplified by the following examples.

Example 1

- *Hydrochlorothiazide 50 mg*
  No. XC
  Sig. i q AM for HBP
  If the prescription was filled initially on April 15, on about what date should the patient return to have the prescription refilled?
- Answer: 90 tablets, taken 1 per day, should last 90 days, approximately 3 months, and the patient should return to the pharmacy on or shortly before July 15 of the same year.

Example 2

- *Penicillin V Potassium Oral Solution 125 mg/5 mL*
  Disp._____mL
  Sig. 5 mL q6h ATC X 10 d
  How many milliliters of medicine should be dispensed?
- Answer: 5 mL times 4 (doses per day) equals 20 mL times 10 (days) equals 200 mL.
- A pharmacist may calculate a patient's percent compliance rate as follows:

$$\%\text{Compliance rate} = \frac{\text{Number of days supply of medication}}{\text{Number of days since last Rx refill}} \times 100$$

Example 3

- *What is the percent compliance rate if a patient received a 30-day supply of medicine and returned in 45 days for a refill?*

$$\%\,Compliance\,rate = \frac{30\,days}{45\,days} \times 100 = 66.6\%\,answer.$$

The End