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Principles of pharmacy practice
lec4

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Interpretation of prescription or medication orders

Objectives

➢ Interpret correctly standard abbreviations and symbols used on prescriptions and medication orders.
➢ Differentiate between patient compliance and noncompliance and apply calculations to determine compliancy

Use of Abbreviations and Symbols

The use of abbreviations is common on prescriptions and medication orders. Some are derived from the Latin through its historical use in medicine and pharmacy, whereas others have evolved through prescribers' use of writing shortcuts. Unfortunately, medication errors can result from the misuse, Misinterpretation ,and illegible writing of abbreviations, and through the use of ad hoc, or made-up, abbreviations.

The use of a controlled vocabulary, a reduction in the use of abbreviations, care in the writing of decimal points, and the proper use of leading and terminal zeros have been urged to help reduce medication errors. It should be emphasized that a misplaced or misread decimal point represents a minimum of a 10-fold error. Among the specific recommendations to help reduce medication errors arising from poorly written, illegible, or misinterpreted prescriptions and medication orders are the following

- ❑ 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 gms; for milligrams, use mg and not mgs or mgm

- ❑ Spell out ''units'' (e.g., use 100 units and not 100 u or 100 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.''
- ❑ 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.'').

The portions of the prescription presenting directions to the pharmacist (the Subscription)
and 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

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

ABBREVIATION (LATIN ORIGIN[c])	MEANING	ABBREVIATION (LATIN ORIGIN[c])	MEANING
Prescription Filling Directions		pt.	pint
aa. or (ana)	of each	qt.	quart
ad (ad)	up to; to make	ss or s̄s̄ (semissem	one half
disp. (dispensatur)	dispense	tbsp.	tablespoonful
div. (dividatur)	divide	tsp.	teaspoonful
d.t.d. (dentur tales doses)	give of such doses	**Signa/Patient Instructions**	
ft (fiat)	make	a.c. (ante cibos)	before meals
M. (mice)	mix	ad lib. (ad libitum)	at pleasure, freely
No. (numero)	number	admin	administer
non rep. or NR (non repetatur)	do not repeat	A.M. (ante meridiem)	morning
q.s. (quantum sufficit)	a sufficient quantity	aq. (aqua)	water
		ATC	around the clock
q.s. ad (quantum sufficiat ad)	a sufficient quantity to make	b.i.d. (bis in die)	twice a day
		c or c̄ (cum)	with
Sig. (Signa)	write (directions on label)	d (die)	day
		dil. (dilutus)	dilute
		et	and
Quantities and Measurement		h. or hr. (hora)	hour
BSA	body surface area	h.s. (hora somni)	at bedtime
cm³	cubic centimeter or milliliter (mL)	i.c. (inter cibos)	between meals
		min. (minutum)	minute
f or fl (fluidus)	fluid	m&n	morning and night
flȝ or fȝ	fluid dram (= teaspoonful, 5 mL)	N&V	nausea and vomiting
		noct. (nocte)	night
flȝss orfȝss	half-fluidounce (= tablespoonful, 15mL)	NPO (non per os)	nothing by mouth
		p.c. (post cibos)	after meals
g	gram	P.M. (post meridiem)	afternoon; evening
gal	gallon		
gtt (gutta)	drop	p.o. (per os)	by mouth (orally)
lb (libra)	pound	p.r.n. (pro re nata)	as needed
kg	kilogram	q (quaque)	every
L	liter	qAM	every morning
m² or M²	square meter	q4h, q8h, etc.	every ___ hours
mcg	microgram	q.i.d. (quarter in die)	four times a day
mEq	milliequivalent	rep. (repetatur)	repeat
mg	milligram	s (sine)	without
mg/kg	milligrams (of drug) per kilogram (of body weight)	s.i.d. (semel in die)	once a day
		s.o.s. (si opus sit)	if there is need; as needed
mg/m²	milligrams (of drug) per square meter (of body surface area)	stat. (statim)	immediately
		t.i.d. (ter in die)	three times a day
		ut dict. (ut dictum)	as directed
mL	milliliter	wk.	week
mL/h	milliliters (of drug administered) per hour (as through intravenous administration)	**Medications**	
		APAP	acetaminophen
		ASA	aspirin
mOsm or mOsmol	milliosmoles	AZT	zidovudine
oz.	ounce		

ABBREVIATION (LATIN ORIGIN[c])	MEANING	ABBREVIATION (LATIN ORIGIN[c])	MEANING
EES	erythromycin ethylsuccinate	D5NS	dextrose 5% in normal saline (0.9% sodium chloride)
HC	hydrocortisone		
HCTZ	hydrochlorothiazide	D5W	dextrose 5% in water
MTX	methotrexate	D10W	dextrose 10% in water
NTG	nitroglycerin	elix.	elixir
Clinical		inj.	injection
BM	bowel movement	NS	normal saline
BP	blood pressure	½NS	half-strength normal saline
BS	blood sugar		
CHD	coronary heart disease	oint or ungt. (unguentum)	ointment
CHF	congestive heart failure		
GERD	gastrointestinal reflux disease	pulv. (pulvis)	powder
		RL, R/L or LR	Ringer's Lactate or Lactated Ringer's
GI	gastrointestinal		
GFR	glomerular filtration rate	sol. (solutio)	solution
GU	genitourinary	supp. (suppositorium)	suppository
HA	headache		
HBP	high blood pressure	susp.	suspension
HRT	hormone replacement therapy	syr. (syrupus)	syrup
		tab. (tabletta)	tablet
HT or HTN	hypertension	**Routes of Administration**	
IOP	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
		IVP	intravenous push
UTI	urinary tract infection	IVPB	intravenous piggy back
Dosage Forms/Vehicles		NGT	nasogastric tube
amp.	ampul	p.o. or PO (per os)	by mouth
cap.	capsule	rect.	rectal or rectum
D5LR	dextrose 5% in lactated Ringer's	SL	sublingual
		SubQ	subcutaneously
		Top.	topically
		V or PV	vaginally

Examples of prescription directions to the pharmacist:
(a) M. ft. ung.
Mix and make an ointment.
(b) Ft. sup. no xii
Make 12 suppositories.
(c) M. ft. cap. d.t.d. no. xxiv
Mix and make capsules. Give 24 such doses.
Examples of prescription directions to the patient:
(a) 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.
(b) gtt. ii rt.eye every a.m.
Instill two (2) drops in the right eye every morning.
(c) 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

Medication Scheduling and Patient Compliance

Medication scheduling may be defined as the frequency (i.e., times per day) and duration (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 formulations, 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. 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.

Some conditions, such as indigestion, may require a single dose of medication for correction. Other conditions, such as a systemic infection, may require multiple daily, around-the-clock dosing for 10 days or more. Long-term maintenance therapy for conditions such 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 non prescribed 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, and with proper regard to food and drink and consideration of other concomitant medications (both prescribed or non presribed) and herbal remedies.
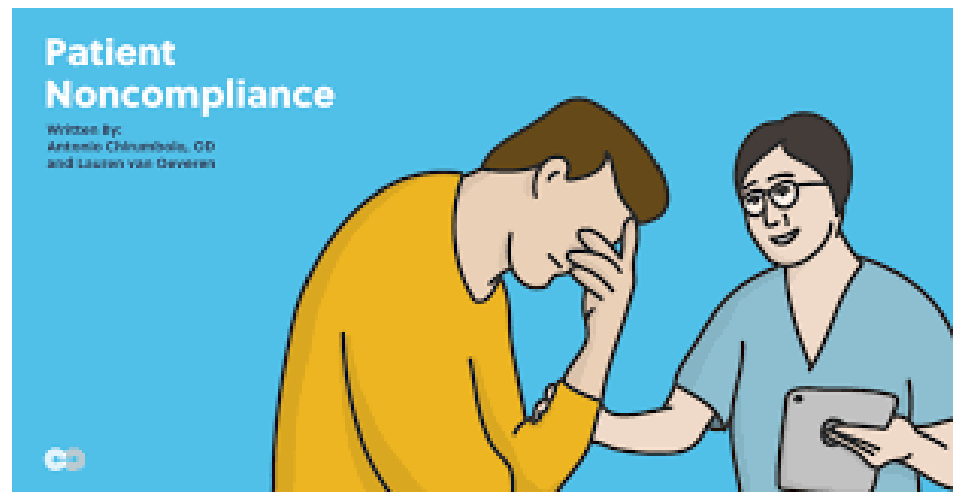
Patient noncompliance is the failure to comply with practitioner's c or labeled direction in the self-administration of any medication. Noncompliance may involve under dosage or overdosage, inconsistent or sporadic dosing, incorrect duration of treatment, and drug abuse or misadventuring with medications.

Patient noncompliance may result from a number of factors, including 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, and other factors. Frequently, patients forget whether they have taken their medications

This situation is particularly common for patients who are easily confused, who have memory failure, or who are taking multiple medications scheduled to be taken at different times during the day or night. Special compliance aids are available to assist patients in their proper scheduling of medications. These devices include medication calendars, reminder charts, and special Containers .Patient noncompliance is not entirely the problem of ambulatory or non institutionalized 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..

Patient Compliance

Better Compliance = Better Data = Better Results

- Devyani Joshi

Even in these settings, however, 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 may include worsening of the condition, the requirement of additional and perhaps more expensive and extensive treatment methods or surgical procedures, otherwise unnecessary hospitalization, and Increased total health care cost .Students interested in additional information on patient compliance are referred to other sources of information.12,13 Some of the different types of problems relating to patient compliance with medication are exemplified by the following examples

Examples:

R̸ 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, or approximately 3 months, and the patient should return to the pharmacy on or shortly before July 15 of the same year.

℞   Penicillin V Potassium Oral Solution   125 mg/5 mL
      Disp._____mL
      Sig. 5 mL q 6h ATC × 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:% Compliance rate

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

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

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

In determining the patient's actual (rather than apparent) compliance rate, it is important to determine if the patient had available and used extra days' dosage from some previous filling of the prescription