Ratio and Proportion Dosage Calculations 2nd Edition Giangrasso Solutions Manual
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Chapter 2

Safe and Accurate Medication Administration

Chapter Overview

Chapter 2 is a general introduction to the drug administration process. It introduces the student to the role of the person who administers patient medication. It also introduces the various forms and routes by which medications are administered. The student will begin to develop a vocabulary of terms necessary to understand pertinent information about drugs and their administration. This will help the student to understand the responsibilities of administering drugs safely. Safety, documentation, and accuracy are stressed throughout the text. Recent Joint Commission recommendations are included, and the "Six Rights" of Medication Administration are discussed extensively. The student will learn how to interpret drug prescriptions, medication orders, medication administration records (MARs), drug labels package inserts, and military time. The roles of the FDA and other organizations concerned with decreasing medication errors are discussed, and websites provided.

Instructor's Notes

- The PowerPoint slides are particularly useful in presenting the material in this chapter. Slides of drug prescriptions, medication orders, medication administration records, drug labels, and package inserts can be projected as the instructor explains their various components.
- Demonstrate actual examples of various forms of drugs (e.g., inhalers, tablets, capsules, patches, and suppositories), if available.
- Students who have learned this material in other courses may review this chapter quickly.
- Discuss the abbreviations to be avoided in medication orders and documentation (i.e., the "Do Not Use List").
- Emphasize the importance of the need to be vigilant regarding drugs that "Look-Alike/Sound-Alike."
- The *Nurse Alert* newsletter of the Institute of Safe Medication Practice is a good reference for medication safety issues.

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- Interpreting a drug order is important for the rest of the course and should be stressed.
- If the internet is accessible in the classroom, pharmaceutical company websites can be used to view actual package inserts for drugs.

Key Terms

automated medication dispensing cart (ADC)
am/pm
bar code
b.i.d.
body surface area (BSA)
buccal
capsule
computerized physician order entry (CPOE)
controlled substance
delayed release (DR)
dosage strength
dry powder inhaler (DPI)
elixir
enteral
enteric-coated
epidural
extended release (XL)
Federal Drug Administration (FDA)
generic name
inhalation
Institute for Safe Medication Practice (ISMP)
intracardiac (IC)
intradermal (ID)
intramuscular (IM)
intrathecal
intravenous (IV)
local/systemic
lot number
medication administration record (MAR)
medication order
metered dose inhaler (MDI)
meters squared (m^2)
military time
national drug code (NDC)
nebulizer
oral (PO)
package insert
parenteral
pharmacist
Physician's Desk Reference (PDR)
prescriber
prescription
prn
q.i.d.
registration symbol (®)
route
safe dose range
side effect
standing order
stat
subcutaneous (subcut)
sublingual (SL)
suspension
sustained release (SR)
syrup
tablet
t.i.d.
topical
trademark (™)
trade name
transdermal
unit dose
United States Pharmacopoeia (USP)

Answers to Chapter 2 Additional Exercises

1. lopinavir/ritonavir
2. Singular
3. 160 mL
4. 250 mg/5 mL
5. 40 mg per tablet
6. (a) Anusol supp
   (b) 6 A.M.
   (c) 4
   (d) Bonivar, Humulin N, Humulin R
   (e) December 16
7. (a) digoxin, Lasix
   (b) Reglan
   (c) 10 mg po
   (d) transdermal
   (e) Omnicef
8. (a) 500 mg/m^2 IV on day 1 of each 21-day cycle
   (b) fatigue, nausea, and anorexia
   (c) yes
   (d) intravenous

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9. (a) 9 A.M.–0900h
   3 P.M.–1500h
   Noon–1200h
   6 P.M.–1800h
   8:15 P.M.–2015h
   2:30 A.M.–0230h
   4:45 P.M.–1645h
   6 A.M.–0600h
   Midnight–0000h
10. (a) digoxin twenty-five hundredths milligram, by mouth daily, do not give if the heart rate is less than 60
    (b) Toradol (ketorolac) 15 milligrams intravenous push every 6 hours for four doses
    (c) Milk of Magnesia 30 milliliters by mouth each day whenever necessary (or as needed) for constipation
    (d) ibuprofen 800 milligrams by mouth three times a day
    (e) Novolin Regular insulin 5 units subcutaneously immediately
11. (a) route of administration is missing
    (b) nothing is missing
    (c) frequency of administration is missing
    (d) frequency of administration is missing
    (e) dosage is missing

Chapter 2 Examination Questions

Study the drug labels shown in ● **Figure 2.1** and supply the following information.

1. What is the generic name of Viagra?

   _____

2. How many capsules are in the Tikosyn container?

   _____

3. What is the strength of the Singular tablets?

   _____

4. What is the route of administration for dofetilide?

   _____

5. What is the dosage strength for the drug whose NDC number is 0069 5810 60.

   _____

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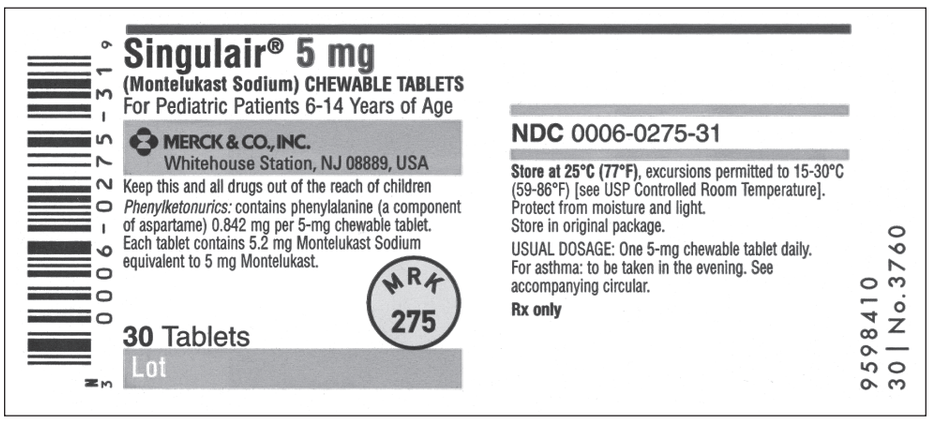
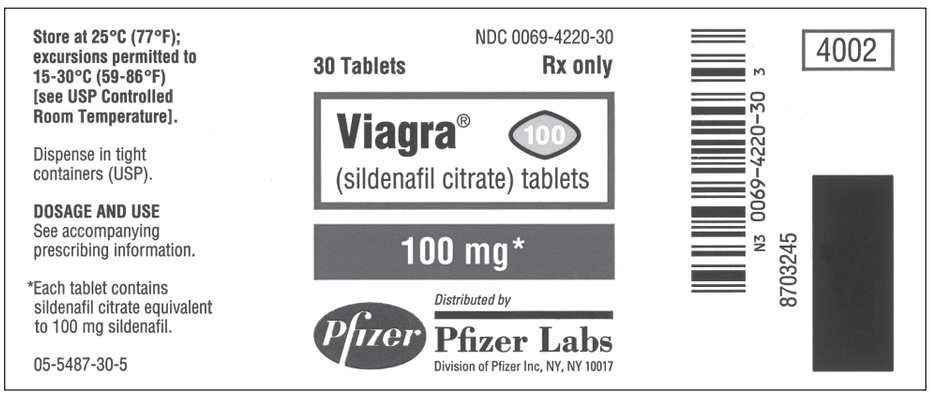
(a)



(b)



(c)

Figure 2.1
Drug Labels for Questions 1–5.

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6. Study the MAR in ●**Figure 2.2**. Fill in the following chart and answer questions a–g.

Name of drug	Dose	Route of administration	Time of administration	Date started	Date discontinued
isoproterenol					
Procardia					
indomethacin					
digoxin					
Diuril					
Carafate					

GENERAL HOSPITAL

YEAR 2013 MONTH July

SOLUTION MEDICATION ADDED DOSAGE AND INTERVAL	DAY	18 INITIALS* AND HOURS	19 INITIALS AND HOURS	20 INITIALS AND HOURS	21 INITIALS AND HOURS	22 INITIALS AND HOURS	23 INITIALS AND HOURS
Date Started 7/18/13	I	JO	JO	JO	JO		
Isoproterenol	AM	9	9	9	9		
15 mg SL t.i.d.	I	LA LA	LA LA	LA LA	LA LA		
Discontinued 7/21/13	PM	1 5	1 5	1 5	1 5		
Date Started 7/18/13	I	JO	JO	JO	JO		
Procardia	AM	9	9	9	9		
20 mg PO b.i.d.	I	LA	LA	LA	LA		
Discontinued 7/21/13	PM	5	5	5	5		
Date Started 7/18/13	I	JO	JO	JO	JO		
indomethacin	AM	9	9	9	9		
25 mg b.i.d. PO	I	LA	LA	LA	LA		
Discontinued 7/21/13	PM	5	5	5	5		
Date Started 7/18/13	I	JO	JO	JO	JO	JO	JO
digoxin 0.25 mg	AM	9	9	9	9	9	9
PO daily	I						
Discontinued 7/23/13	PM						
Date Started 7/18/13	I	JO	JO	JO	JO	JO	JO
Diuril 500 mg	AM	9	9	9	9	9	9
PO daily	I						
Discontinued 7/23/13	PM						
Date Started 7/20/13	I			JO	JO	JO	
Carafate	AM			9	9	9	
1g q.i.d. PO	I			LA LA LA	LA LA LA	LA LA LA	
Discontinued 7/22/13	PM			1 5 9	1 5 9	1 5 9	
Date Started	I						
	AM						
	I						
Discontinued	PM						

ALLERGIES: (Specify) None

Init.	Signature
JO	Jane Olsen L.P.N.
LA	Leon Ablon R.N.
SG	Susan Green R.N.

*INITIALS – Nurses must sign name & title

PATIENT IDENTIFICATION

7286531 7/18/13
TYRELL JOHNSON 3/12/34
755 Bay Ridge Ave
Brooklyn, NY Baptist
11209 Blue Cross
Dr. Anthony Giangrasso

● **Figure 2.2**
Medication Administration Record.

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(a) Identify the drugs administered on July 21, 2013.

_____

(b) Identify the drugs administered PO on July 18, 2013.

_____

(c) How many drugs were administered at 5 P.M. on July 20, 2013?

_____

(d) Which drug(s) were administered daily for 6 consecutive days?

_____

(e) Who administered the Procardia at 5:00 P.M. on July 20?

_____

(f) Identify the drug for which the dosage strength is 0.25 mg.

_____

(g) How many doses of Carafate were received by Mr. Johnson on July 19?

_____

7. Study the physician's order sheet in ● **Figure 2.3**, then answer the following questions.

(a) What is the dose of Inderal?

_____

(b) How many times a day does Mr. Sanchez receive Declomycin?

_____

(c) If the last dose of Declomycin was given at 1800h, at what time would you administer the next dose?

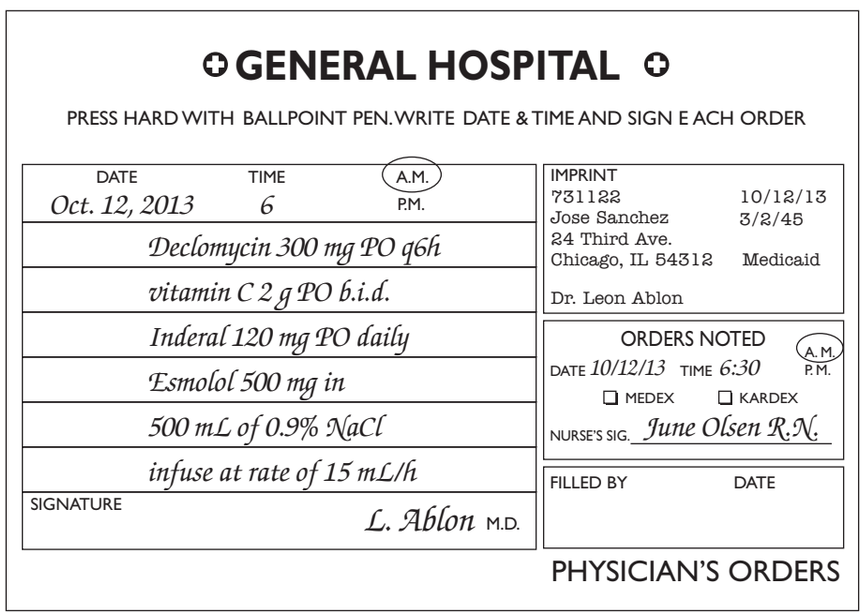
_____

(d) How many milliliters of Esmolol will Mr. Sanchez receive in 120 min?

_____

(e) What was the patient's date of admission?

_____



GENERAL HOSPITAL

PRESS HARD WITH BALLPOINT PEN. WRITE DATE & TIME AND SIGN E ACH ORDER

DATE	TIME	A.M. / P.M.
Oct. 12, 2013	*6*	

Declomycin 300 mg PO q6h
vitamin C 2 g PO b.i.d.
Inderal 120 mg PO daily
Esmolol 500 mg in
500 mL of 0.9% NaCl
infuse at rate of 15 mL/h

SIGNATURE *L. Ablon* M.D.

IMPRINT
731122 10/12/13
Jose Sanchez 3/2/45
24 Third Ave.
Chicago, IL 54312 Medicaid

Dr. Leon Ablon

ORDERS NOTED A.M. / P.M.
DATE *10/12/13* TIME *6:30*
☐ MEDEX ☐ KARDEX
NURSE'S SIG. *June Olsen R.N.*

FILLED BY DATE

PHYSICIAN'S ORDERS

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● **Figure 2.3**
Physician's Order Sheet for Question 7.

8. Use the package insert portion shown in ●**Figure 2.4** to answer the following questions:

   (a) What is the trade name of the drug?

   _____

   (b) What is the usual daily dose for a child aged 15?

   _____

   (c) What is the total oral dose of Declomycin for patients with gonorrhea?

   _____

   (d) How is this drug supplied?

   _____

8:12.24

DECLOMYCIN®
DEMECLOCYCLINE HYDROCHLORIDE
FOR ORAL USE

Adults: Usual daily dose - Four divided doses of 150 mg each or two divided doses of 300 mg each.

For children above eight years of age: Usual daily dose, 3-6 mg per pound body weight per day, depending upon the severity of the disease, divided into two to four doses.

Gonorrhea patients sensitive to penicillin may be treated with demeclocycline administered as an initial oral dose of 600 mg followed by 300 mg every 12 hours for four days to a total of 3 grams.

HOW SUPPLIED
DECLOMYCIN® demeclocycline hydrochloride Capsules. 150 mg are two-tone, coral colored, soft gelatin capsules, printed with LL followed by D9 on the light side in blue ink, are supplied as follows:
NDC 0005-9208-23 - Bottle of 100

●**Figure 2.4**
Portion of a Package Insert for Question 8.

Answers to Chapter 2 Examination Questions

1. sildenafil citrate
2. 30 capsules
3. 5 mg per tablet
4. oral
5. 250 mcg (0.25 mg)
6.

Name of drug	Dose	Route of administration	Time of administration	Date started	Date discounted
Isoproterenol	15 mg	sublingual	t.i.d. 9, 1, 5	7/18/13	7/21/13
Procardia	20 mg	PO (by mouth)	b.i.d. 9, 5	7/18/13	7/21/13
indomethacin	25 mg	PO	b.i.d. 9, 5	7/18/13	7/21/13
digoxin	0.25 mg	PO	daily 9 A.M.	7/18/13	7/23/13
Diuril	500 mg	PO	daily 9 A.M.	7/18/13	7/23/13
Carafate	1 g	PO	q.i.d. 9, 1, 5, 9	7/20/13	7/22/13

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(a) isoproterenol, Procardia, indomethacin, digoxin, Diuril, Carafate
(b) Procardia, indomethacin, digoxin, Diuril
(c) four drugs, isoproterenol, Procardia, indomethacin, Carafate
(d) digoxin, Diuril
(e) Leon Ablon
(f) digoxin
(g) none, Carafate was not ordered until July 20

7. (a) 120 mg
(b) four times a day
(c) 2400 h (midnight)
(d) 30 mL
(e) 10/12/13

8. (a) Declomycin
(b) 3 to 6 mg per pound of body weight per day, depending on the severity of the disease, and divided into two to four doses.
(c) 3 grams
(d) 150-mg capsules

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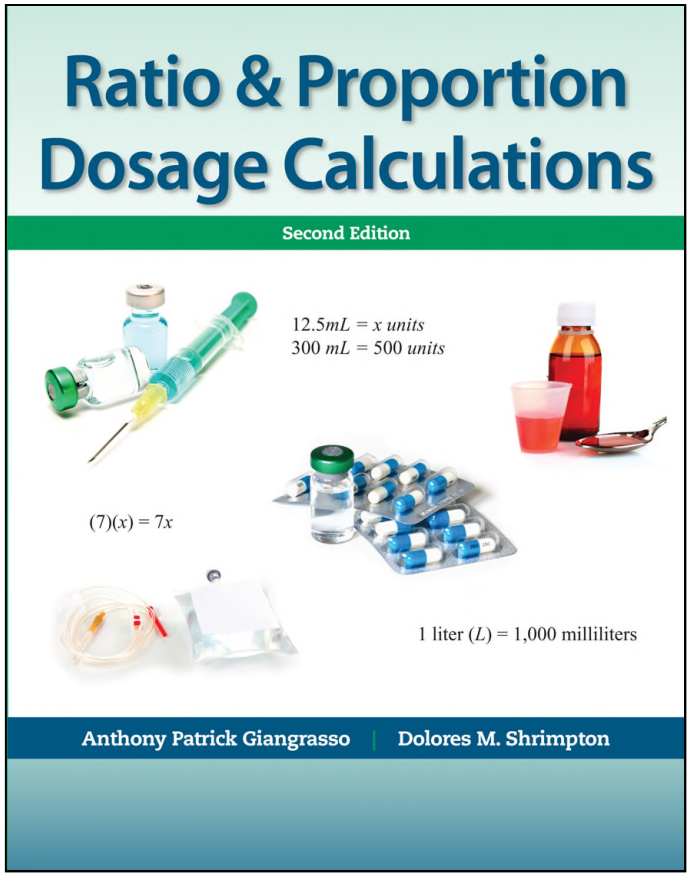
Ratio & Proportion Dosage Calculations

SECOND EDITION



CHAPTER 2

Safe and Accurate Drug Administration

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Learning Outcomes

1. Describe the six "rights" of safe medication administration.
2. Explain the legal implications of medication administration.
3. Describe the routes of medication administration.
4. Identify common abbreviations used in medication administration.

Learning Outcomes

5. Compare the trade name and generic name of drugs.
6. Describe the forms in which medications are supplied.

Learning Outcomes

7. Identify and interpret the components of a drug prescription, physician's order, and medication administration record.
8. Interpret information found on drug labels and drug package inserts.

Who Administers Drugs?

Drug Administration

- Drug administration involves a chain of health care professionals:
  - Prescriber who legally writes the drug order
  - Pharmacist who fills the order
  - Nurse who administers the drug to the patient

Drug Administration

- Each professional is responsible for order accuracy. To ensure patient safety, he or she must understand how a patient's drugs act and interact.
- The person who administers the drug has the last opportunity to identify an error.
- Be familiar with applicable state laws, policies, and procedures.

The Drug Administration Process

Six Rights of Medication Administration

- In order to prepare and administer drugs, it is imperative that you understand and follow the "Six Rights of Medication Administration."
  1. Right drug
  2. Right dose
  3. Right route

Six Rights of Medication Administration

- In order to prepare and administer drugs, it is imperative that you understand and follow the "Six Rights of Medication Administration."
  4. Right time
  5. Right patient
  6. Right documentation

Generic Name

- The generic name is the official accepted name of a drug as listed in the United States Pharmacopeia (USP). The designation of USP after a drug name indicates that the drug meets government standards.
- A drug has only one generic name, but it can have many trade names. By law, generic names must be identified on all drug labels.

Trade Name

- Many companies manufacture the same drug using different *trade* (patented, brand, or proprietary) names. The drug's trade name is followed by the symbol for Trademark ™ or registration ®.

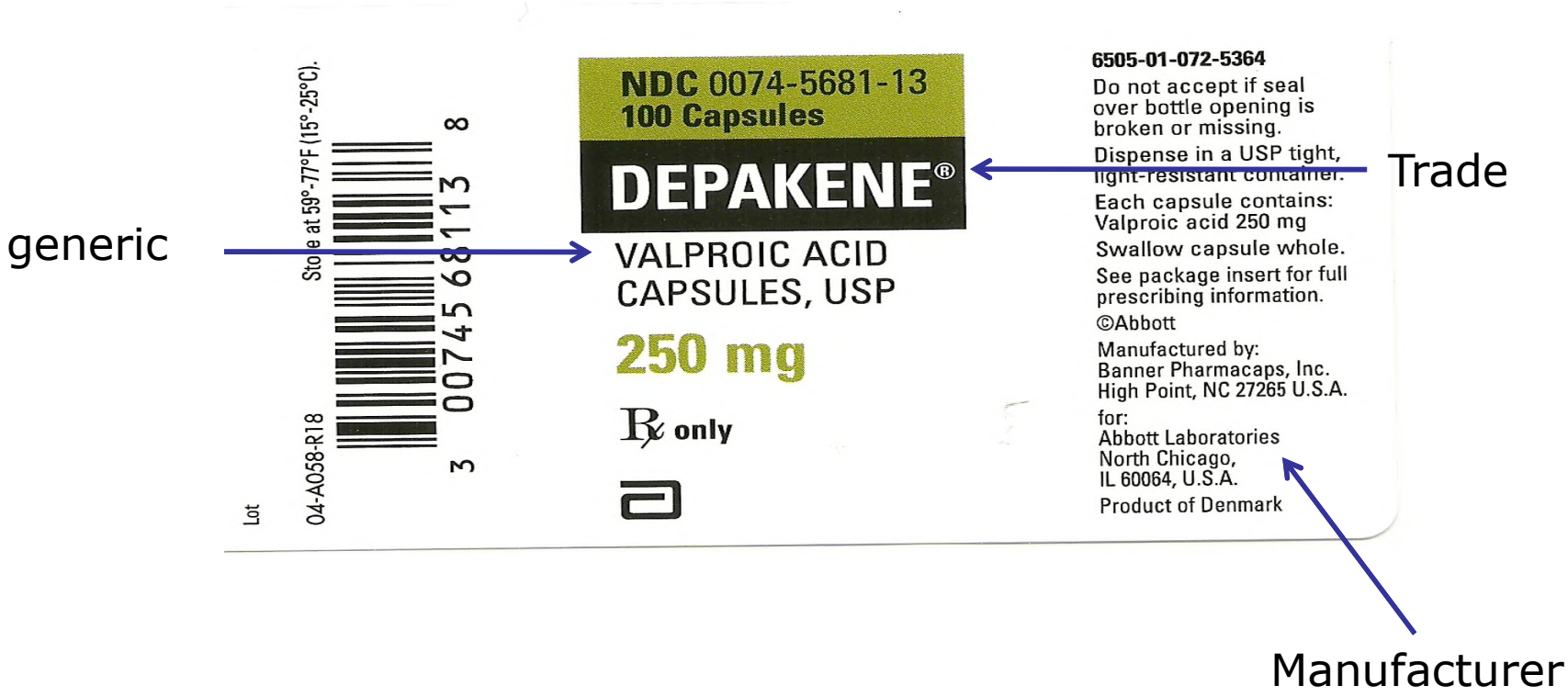
Trade Name

- A generic drug may be manufactured by different companies under different trade names. For example, the generic drug *ibuprofen* is manufactured under the trade names, Motrin and Advil. The active ingredients in Motrin and Advil are the same. However, the size, shape, color, or fillers may be different.

Table 2.1 Look-Alike/Sound-Alike Drugs with Tall Man Lettering

Drug Name	Confused with
aceta**ZOLAMIDE**	aceto**HEXAMIDE**
bu**PROP**ion	bus**PIR**one
chloropro**MAZINE**	chloropro**PAMIDE**
DAUNOrubicin	**DOXO**rubicin
DOBUTamine	**DOP**amine
EPINEPHrine	e**PHED**rine
fenta**NYL**	**SUF**entanil
glipi**ZIDE**	gly**BURIDE**
hydr**ALAZINE**	hydr**OXY**zine
Huma**LOG**	Humu**LIN**
ni**CAR**dipine	**NIFE**dipine
predniso**LONE**	prednisone
TOLAZamide	**TOLBUT**amide
vin**BLAS**tine	vin**CRIS**tine

Drug Labels


generic
Trade
Manufacturer
Store at 59°-77°F (15°-25°C).
3 00745681138
04-A058-R18
Lot
NDC 0074-5681-13
100 Capsules
DEPAKENE®
VALPROIC ACID
CAPSULES, USP
250 mg
℞ only
6505-01-072-5364
Do not accept if seal over bottle opening is broken or missing.
Dispense in a USP tight, light-resistant container.
Each capsule contains:
Valproic acid 250 mg
Swallow capsule whole.
See package insert for full prescribing information.
©Abbott
Manufactured by:
Banner Pharmacaps, Inc.
High Point, NC 27265 U.S.A.
for:
Abbott Laboratories
North Chicago,
IL 60064, U.S.A.
Product of Denmark

Drug Labels

The trade name, *Avodart,* is prominently displayed and can be identified by the ® to its right. The drug's generic name (*dutasteride*) usually appears in lowercase letters.

Dosage Strength

- Dosage strength indicates the amount of drug in a specific unit of measurement.
- The dosage strength of Avodart is 0.5 mg per capsule.

Dosage Strength

Figure 2.2 Unit-dose packages.

Figure 2.2 (continued) Unit-dose packages.

Three Checks

- In order to avoid medication errors, carefully read drug labels at the following times, even if the dose is prepackaged, labeled, and ready to be administered:

1. When reaching for the container
2. Immediately before preparing the dose
3. When replacing or discarding the container

Drug Administration

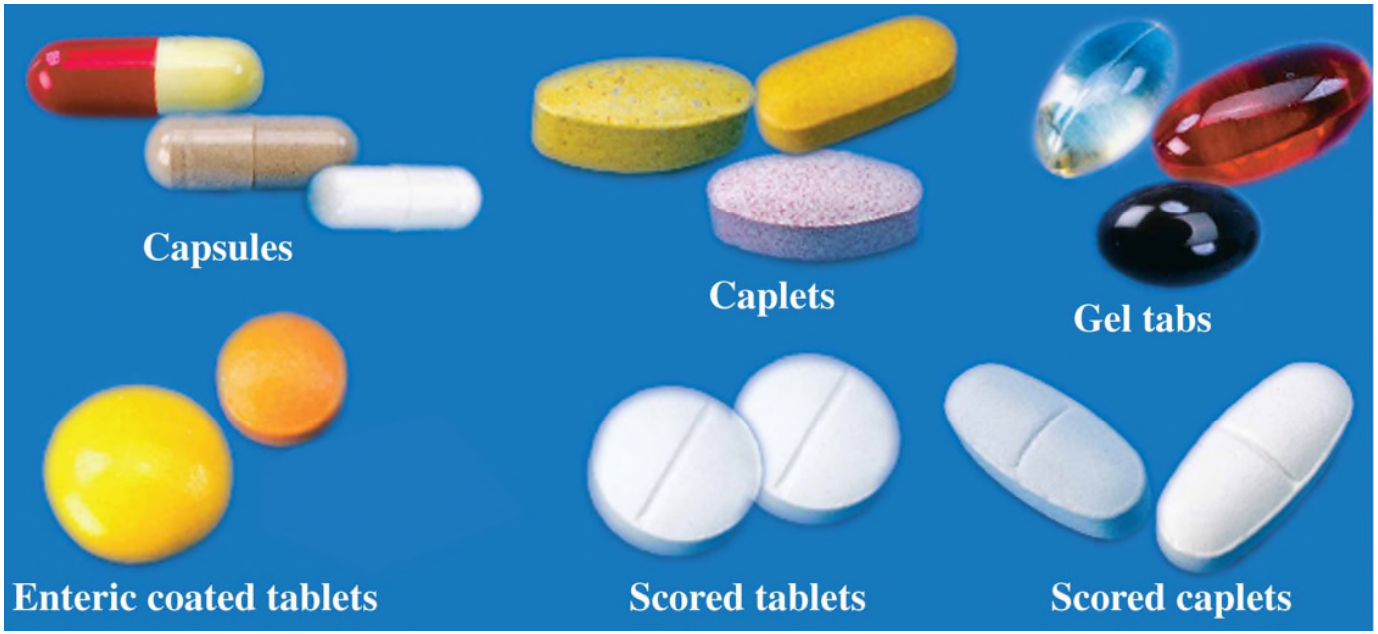
- *Always question the patient concerning any allergies to medications.*
- *Make sure the drug is not expired. Never give a drug from a container that is unlabeled or has an unreadable label.*

Drug Administration

- Right Route
  - Medications must be administered in the form and via the route specified by the prescriber.

Oral Medications

Oral medications are administered) *by mouth* (PO).
Oral drugs are supplied in both *solid* and *liquid* form.



Tablets or Caplets

- *Tablets* (tab) or *caplets*
  - *Scored tablets* may be broken in half.
  - *Enteric-coated* to enable dissolving in the intestine – never to be chewed or crushed
  - *Buccal tablets* for absorption by the mucosa of the mouth
  - *Sublingual* (SL) for absorption under the tongue – never to be swallowed

Tablets or Caplets

- *Tablets* (tab) or *caplets*
  - Capsules (cap) containing powder, liquid, or granules in a gelatin case
  - Sustained-release (SR) or extended-release (XL) to slowly release a controlled amount of medication into the body over a period of time.

Liquid Forms

- Liquid forms
  - Elixir, a medication in an alcohol solution
  - Syrup, a medication dissolved in a sugar and water solution
  - Suspension, an insoluble drug in a liquid base

Figure 2.5 Buccal route: Tablet between cheek and teeth.

Figure 2.6 Sublingual route: Tablet under tongue.

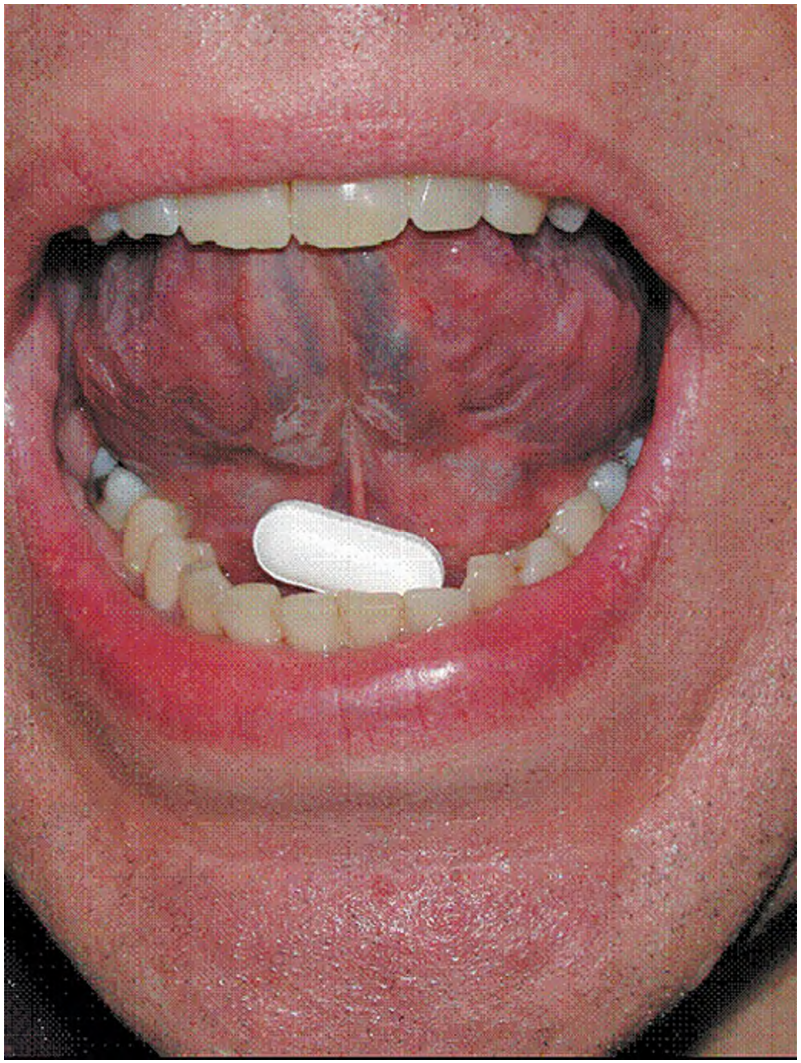
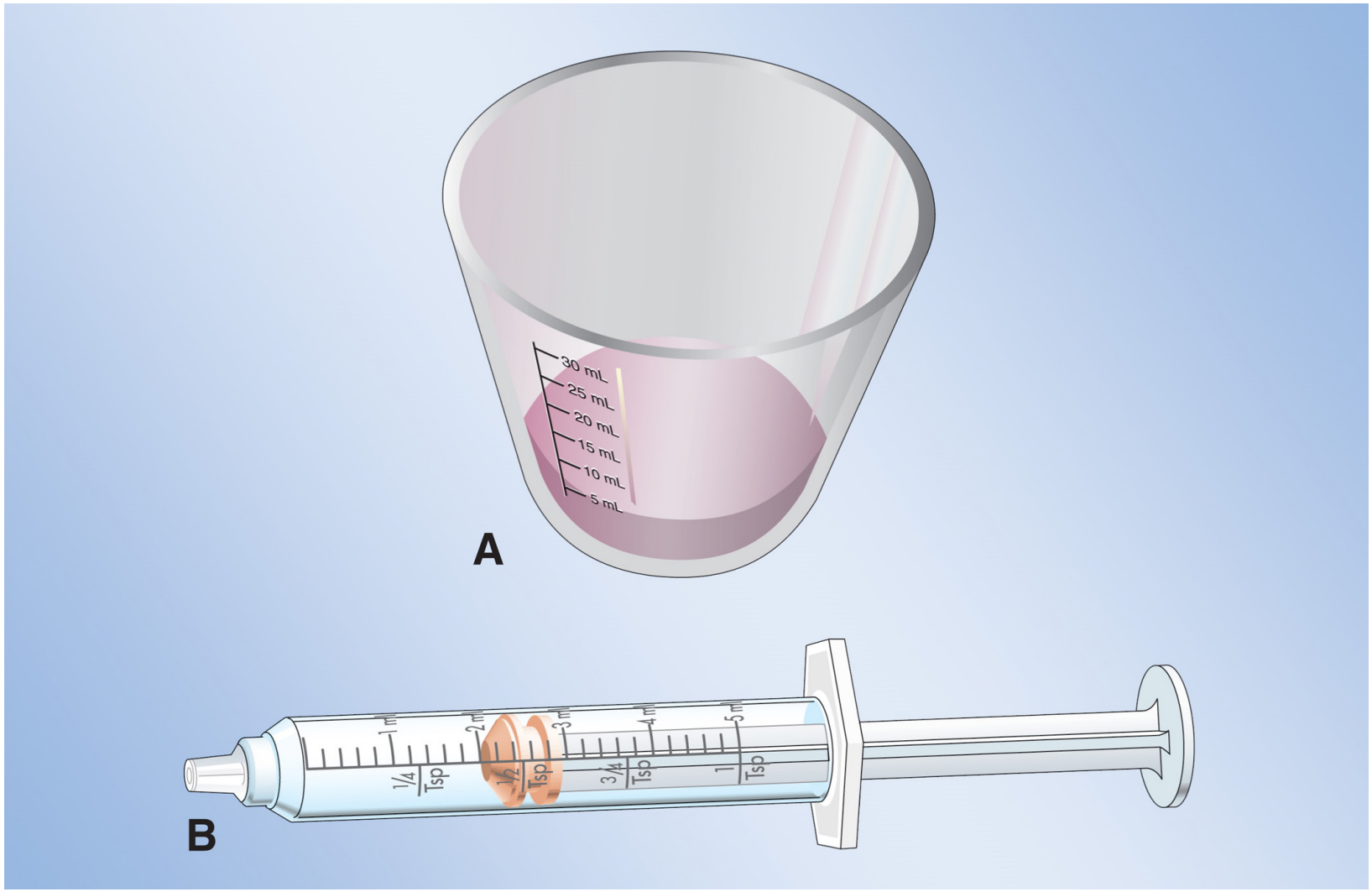
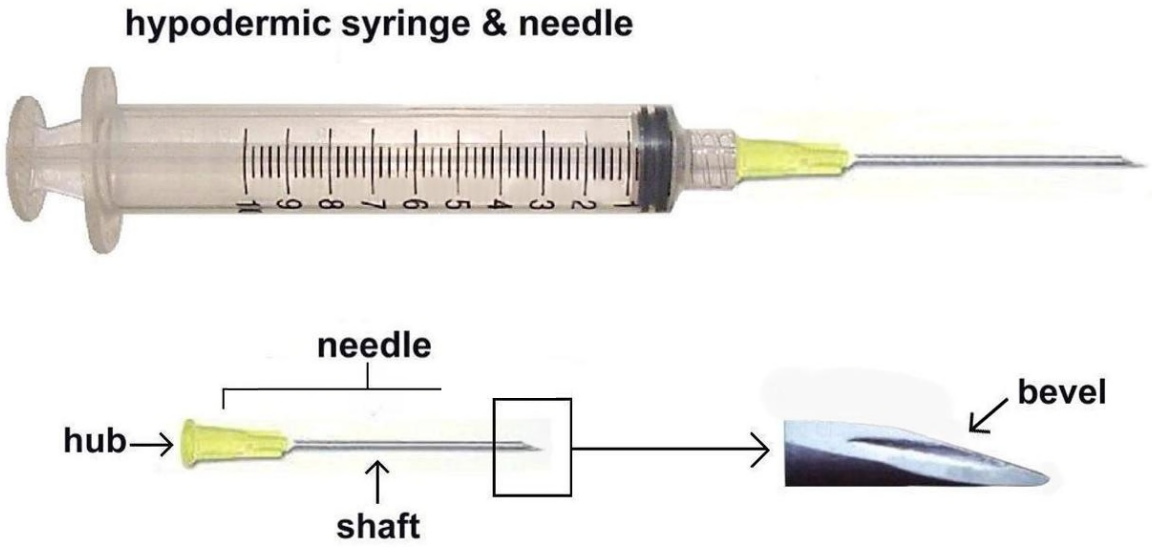


Figure 2.3 Liquid medication in a: a. medication cup, b. oral syringe



Parenteral Medications

- *Parenteral* medications are sterile, administered using aseptic (sterile) technique, and injected (via needle) into the body by various routes.



Major Parenteral Drug Administration Routes

- Intramuscular (IM)
  - Into the muscle
- Subcutaneous (subcut)
  - Into the subcutaneous tissue
- Intravenous (IV)
  - Into the vein

Cutaneous Medications

- *Cutaneous* medications are those that are administered through the skin or mucous membrane.
  - Topical: administered on the skin surface
  - Transdermal: contained in a patch or disk and applied to the skin
  - Inhalation: breathed into the respiratory tract through the nose or mouth

Figure 2.7 Transdermal patch: (a) protective coating removed

Figure 2.7 (continued) Transdermal patch: (b) patch immediately applied to clean, dry, hairless skin and labeled with date, time, and initials.

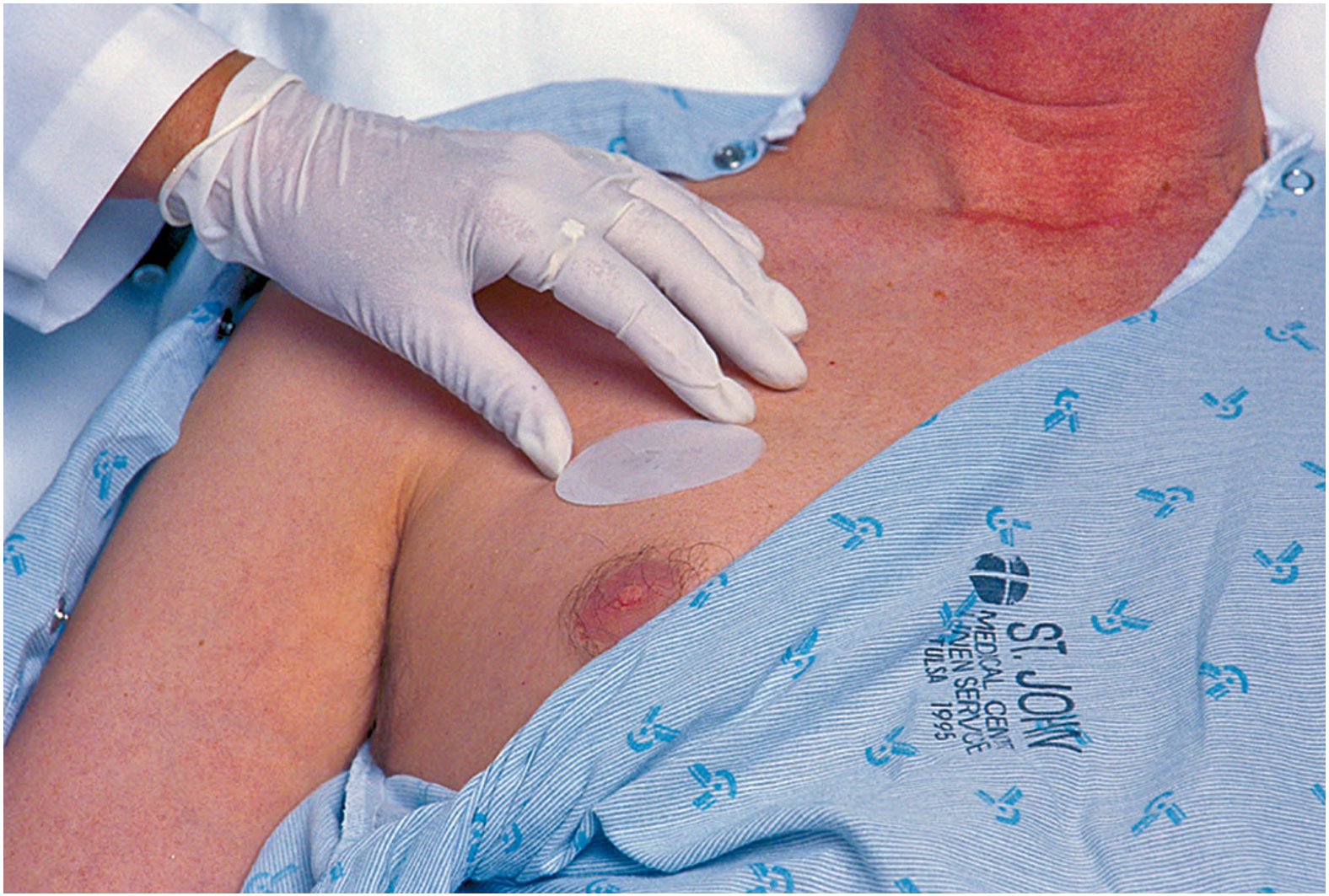


Figure 2.8 Inhalation devices: (a) nebulizer with face mask

Figure 2.8 (continued) Inhalation devices: (b) dry powder inhaler

Figure 2.8 (continued) Inhalation devices: (c) metered dose inhaler.

Cutaneous Medications

- Cutaneous medications are those that are administered through the skin or mucous membrane.
  - Solutions and ointments: applied to the mucosa of the eyes (optic), nose (nasal), ears (otic), or mouth
  - Suppositories: dissolve at body temperature and shaped for insertion into a body cavity (vagina, rectum, or urethra)

Right Time

- The prescriber will indicate when and how often a medication should be administered. Oral medications can be given either before or after meals, depending on the action of the drug.
- Medications can be ordered *once a day* (daily), *twice a day* (b.i.d.), *three times a day* (t.i.d.), or *four times a day* (q.i.d.).

Right Time

- Most healthcare facilities designate specific times for these administrations.
  - To maintain a more stable level of the drug in the patient, the period between administrations of the *drug should be prescribed at regular intervals,* such as q4h (every four hours), q6h, q8h, or q12h.

Right Time

- The dose should be given within 30 minutes of the time specified by the prescriber—up to 30 minutes before or 30 minutes after. Check the policy of the facility.
- Timing of medication administration can be critical for maintaining stable concentration of the drug in the blood and avoiding interactions with other drugs.

Right Patient

- Before administering any medication, it is essential to determine the recipient's identity. At least two identifiers are required by the Joint Commission:
  - Patient identification bracelet information
  - Verbalization of the patient's name by the patient or parent
  - Patient's hospital number or patient's home telephone number

Right Patient

- After identifying the patient, match the drug order, patient's name, and age to the Medication Administration Record (MAR). Some agencies use a scanner to match a bar code on the patient's ID bracelet to a bar code on the MAR.
  - Never use the patient's bed number or room number as an identifier.

Figure 2.9 Bar codes: (a) unit-dose drug

Figure 2.9 (continued) Bar codes: (b) scanner reading a patient's identification band.

Right Documentation

- Always document the name and dosage of the drug, as well as the route and time of administration, on the MAR.
  - Sign your initials immediately after, but never before, the dose is given and include any relevant information:
    - Patient allergies to medications
    - Heart rate (when giving digoxin)
    - Blood pressure (when giving antihypertensive drugs)

Right Documentation

- All documentation must be legible.
- Remember the axiom, "If it's not documented, it's not done."
- Anticipate side effects.

Common Abbreviations

- Safe drug administration requires a knowledge of common abbreviations.
  - The Joint Commission requires health care organizations to follow its official "Do Not Use List" that applies to all medication orders and all medication documentation.
  - Only approved abbreviations should be used.

Table 2.3 JCAHO Official "Do Not Use List"[1]

Do Not Use	Potential Problem	Use Instead
U (for unit)	Mistaken for "0" (zero), the number "4" (four) or "cc"	Write "unit"
IU (International Unit)	Mistaken for IV (intravenous) or the number 10 (ten)	Write "International Unit"
Q.D., QD, q.d., qd (daily)	Mistaken for each other	Write "daily"
Q.O.D., QOD, q.o.d, qod (every other day)	Period after the Q mistaken for "I" and the "O" mistaken for "I"	Write "every other day"
Trailing zero (X.0 mg)[2]	Decimal point is missed	Write X mg
Lack of leading zero (.X mg)		Write 0.X mg
MS	Can mean morphine sulfate or magnesium sulfate	Write "morphine sulfate" Write "magnesium sulfate"
MSO_4 and $MgSO_4$	Confused for one another	

[1] Applies to all orders and all medication-related documentation that is handwritten (including free-text computer entry) or on preprinted forms.

[2] **Exception:** A "trailing zero" may be used only where required to demonstrate the level of precision of the value being reported, such as for laboratory results, imaging studies that report size of lesions, or catheter/tube sizes. It may not be used in medication orders or other medication-related documentation.

Table 2.3 JCAHO Official "Do Not Use List"[1]

Additional Abbreviations, Acronyms, and Symbols
(For *possible* future inclusion in the Official "Do Not Use" List)

Do Not Use	Potential Problem	Use Instead
> (greater than)	Misinterpreted as the number	Write "greater than"
< (less than)	"7" (seven) or the letter "L" Confused for one another	Write "less than"
Abbreviations for drug names	Misinterpreted due to similar abbreviations for multiple drugs	Write drug names in full
Apothecary units	Unfamiliar to many practitioners Confused with metric units	Use metric units
@	Mistaken for the number "2" (two)	Write "at"
cc	Mistaken for U (units) when poorly written	Write "mL" or "milliliters"
μg	Mistaken for mg (milligrams) resulting in one thousand-fold overdose	Write "mcg" or "micrograms"

Table 2.2 Common Abbreviations Used for Medication Administration

Abbreviation	Meaning	Abbreviation	Meaning
Route:		q12h	every twelve hours
GT	gastrostomy tube	Q.I.D. or q.i.d.	four times per day
ID	intradermal	Stat	immediately
IM	intramuscular	T.I.D. or t.i.d.	three times per day
IV	intravenous		
IVP	intravenous push	**General:**	
IVPB	intravenous piggyback	c	with
NGT	nasogastric tube	cap	capsule
PEG	percutaneous endoscopic-gastrostomy	d.a.w.	dispense as written
		DR	delayed release
PO	by mouth	ER	extended release
PR	by rectum	g	gram
SL	sublingual	gr	grain
subcut	subcutaneously	gtt	drop
Supp	suppository	kg	kilogram

Table 2.2 Common Abbreviations Used for Medication Administration

Abbreviation	Meaning	Abbreviation	Meaning
Frequency:		L	liter
ac	before meals	mcg	microgram
ad lib	as desired	mg	milligram
B.I.D. or b.i.d.	two times a day	mL	milliliter
h, hr	hour	NKDA	no known drug allergies
hs	at bedtime	NPO	nothing by mouth
pc	after meals	s	without
prn	whenever needed or necessary	Sig	directions to patient
		Susp	suspension
q	every	SR	sustained release
q2h	every two hours	t or tsp	teaspoon
q4h	every four hours	T or tbs	tablespoon
q6h	every six hours	tab	tablet
q8h	every eight hours	XL or XR	extended release

Drug Prescriptions

- A drug prescription is a directive to the pharmacist for a drug to be given to a patient who is being seen in a medical office or clinic or is being discharged from a healthcare facility.
- A prescription can be written, faxed, phoned, or emailed from a secure encrypted computer system to a pharmacist.

Drug Prescriptions (cont'd)

- All prescriptions should contain the following:
  - Prescriber's full name, address, and telephone number
  - Drug Enforcement Administration (DEA) number, if it is a controlled substance
  - Date the prescription is written

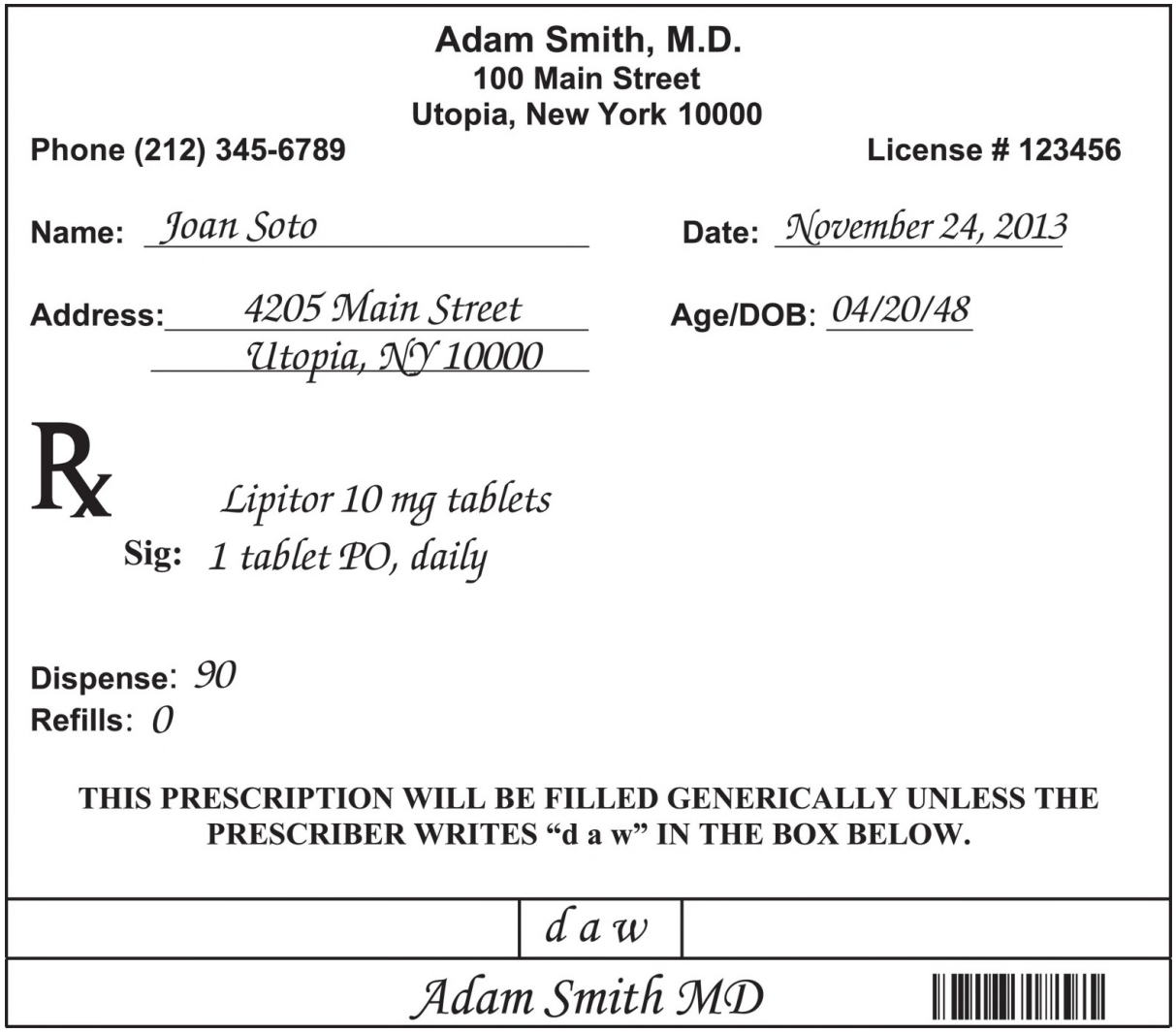
Drug Prescriptions (cont'd)

- All prescriptions should contain the following:
  - Patient's full name, address, and age or date of birth
  - Drug name (generic name should be included), dosage, route, frequency, and amount to be dispensed

Drug Prescriptions (cont'd)

- All prescriptions should contain the following:
  - If only the trade name is written, the prescriber must indicate weather it is acceptable to substitute a generic form
  - Number of refills permitted
  - Directions to the patient that must appear on the drug container

Figure 2.10 Drug prescription for Lipitor.



Adam Smith, M.D.
100 Main Street
Utopia, New York 10000

Phone (212) 345-6789 License # 123456

Name: *Joan Soto* Date: *November 24, 2013*

Address: *4205 Main Street*
Utopia, NY 10000 Age/DOB: *04/20/48*

Rx *Lipitor 10 mg tablets*

Sig: *1 tablet PO, daily*

Dispense: *90*
Refills: *0*

THIS PRESCRIPTION WILL BE FILLED GENERICALLY UNLESS THE PRESCRIBER WRITES "d a w" IN THE BOX BELOW.

	d a w	

Adam Smith MD

Medication Orders

- Medication orders (drug orders, physician's orders) are directives to the pharmacist for the drugs used in a hospital or other healthcare facility. Orders are written in the sequence: drug name, dose, route, frequency.
  - Written medication orders are stated in a special book for doctor's orders, on a physician's order sheet in the patient's chart or in a computer.

Medication Orders

- Verbal orders must contain the same components as a written order and are generally only acceptable in an emergency. They must eventually be written and signed by the physician. They contain drug name, dose, route, and frequency.

Medication Orders

- Routine order: most common type of medication order where drug is administered until a discontinuation order is written or until a specified date is reached

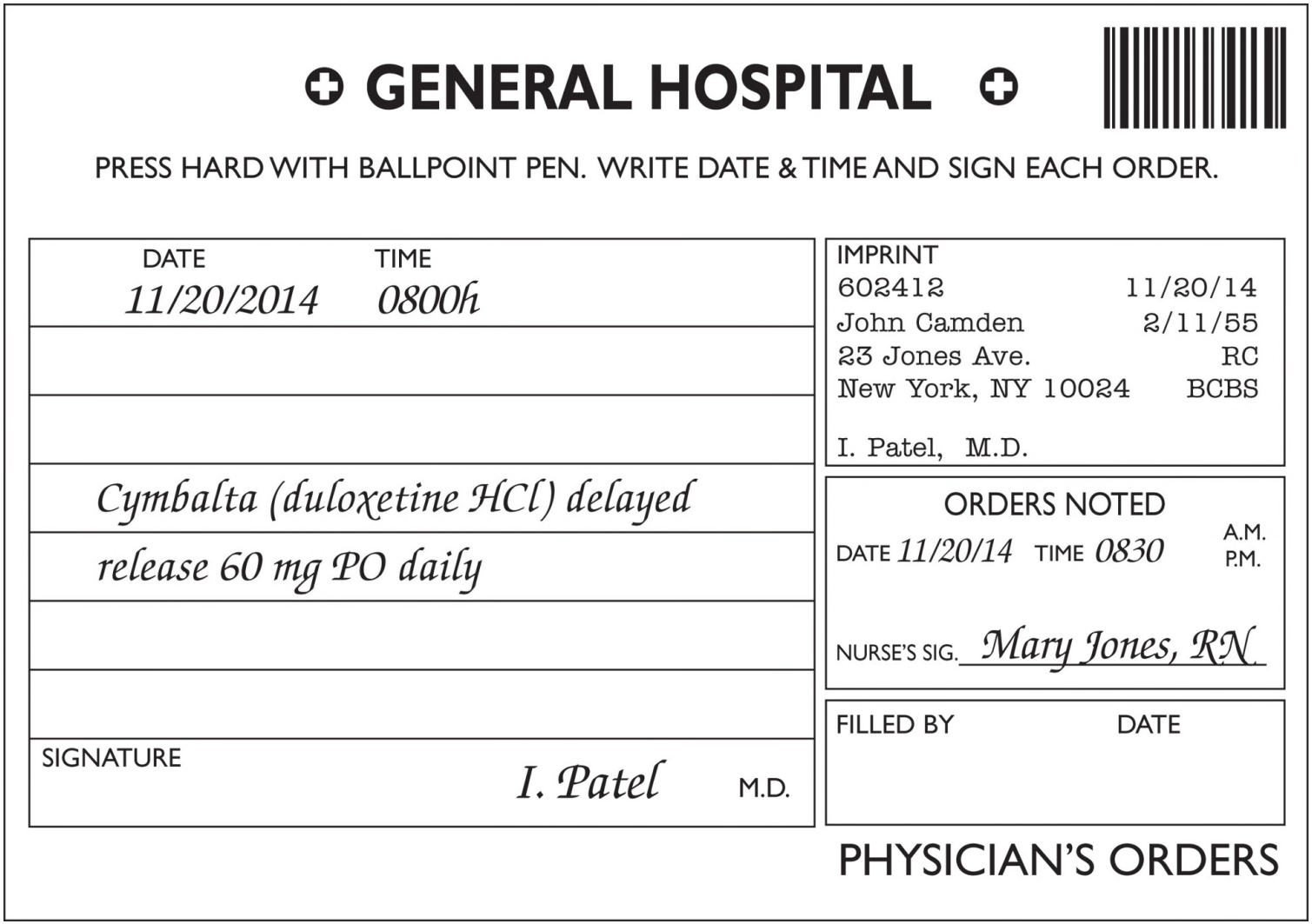
Medication Orders

- Standing order: prescribed in anticipation of sudden changes in a patient's condition, typically seen in critical care units where rapid changes occur requiring immediate action and in long term care facilities where a physician may not be readily available (e.g., "Tylenol 650 mg PO q 4 hrs for temperature of 101° F or higher").

Medication Orders

- Prn order: for a drug to be given when a patient needs it (e.g., Codeine 30 mg PO q4h prn mild–moderate pain.")
- Stat order: to be administered immediately in emergency situations or when a patient's condition suddenly changes (e.g., "Lasix 80 mg IV stat.")

Figure 2.13 Physician's order for Cymbalta (duloxetine HCl).



⊕ GENERAL HOSPITAL ⊕

PRESS HARD WITH BALLPOINT PEN. WRITE DATE & TIME AND SIGN EACH ORDER.

DATE *11/20/2014* TIME *0800h*

Cymbalta (duloxetine HCl) delayed release 60 mg PO daily

SIGNATURE *I. Patel* M.D.

IMPRINT
602412 11/20/14
John Camden 2/11/55
23 Jones Ave. RC
New York, NY 10024 BCBS

I. Patel, M.D.

ORDERS NOTED
DATE *11/20/14* TIME *0830* A.M. P.M.

NURSE'S SIG. *Mary Jones, RN*

FILLED BY DATE

PHYSICIAN'S ORDERS

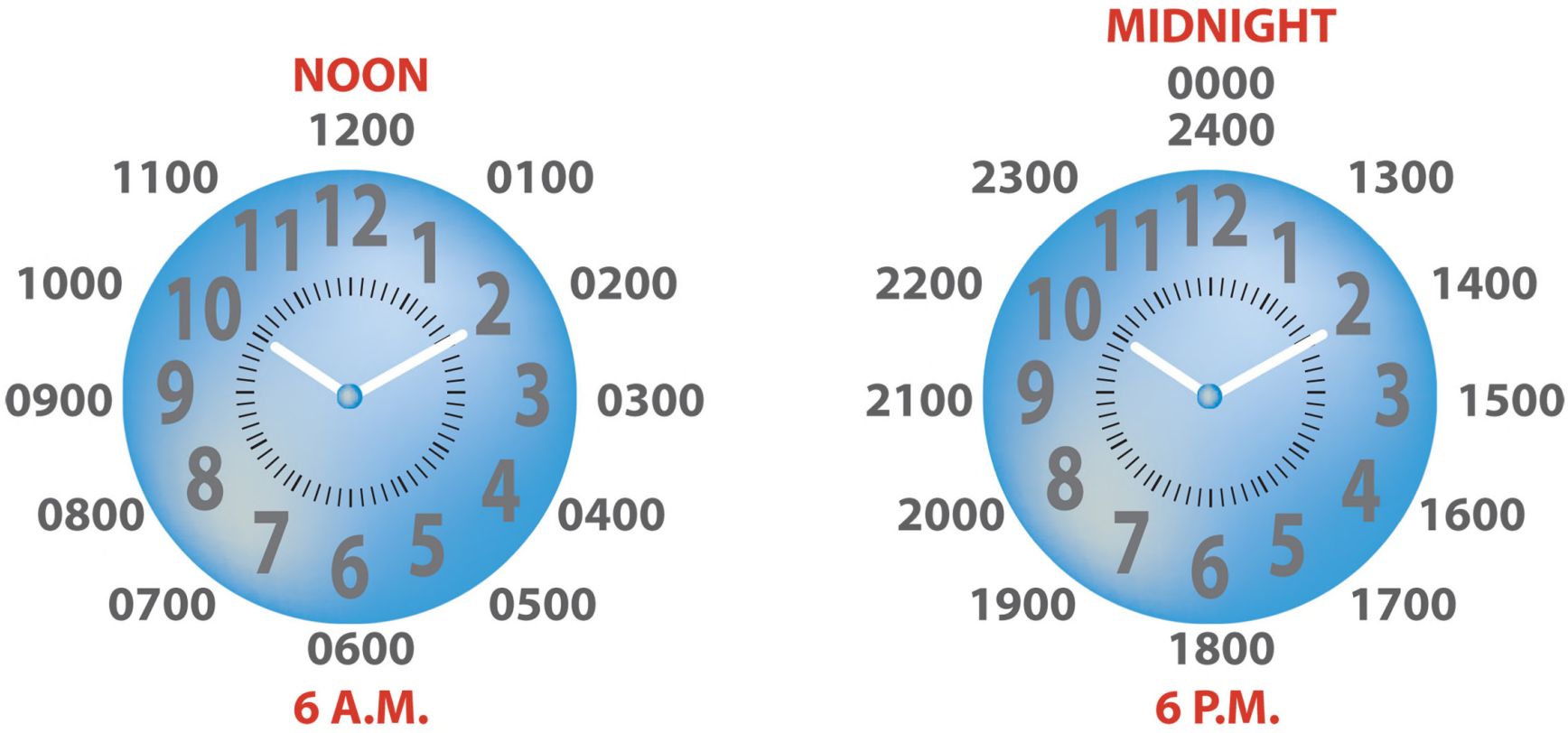
Medication Orders

- Date and time are necessary when an order is written.
  - Many institutions use military time, which is based on a "24 hour clock" that does not use a.m. or p.m. Military times are written as four-digit numbers.

Medication Orders

- Date and time are necessary when an order is written.
  - Thus, 2:00 am in military time is 0200h (pronounced "Oh two hundred hours"), 12 noon is 1200h (pronounced twelve hundred hours), 2:00 pm is 1400h (pronounced fourteen hundred hours), and midnight is 2400h, also written as 0000h.

Figure 2.12 Clocks Showing 10:10 a.m. (1010h) and 10:10 p.m. (2210h).



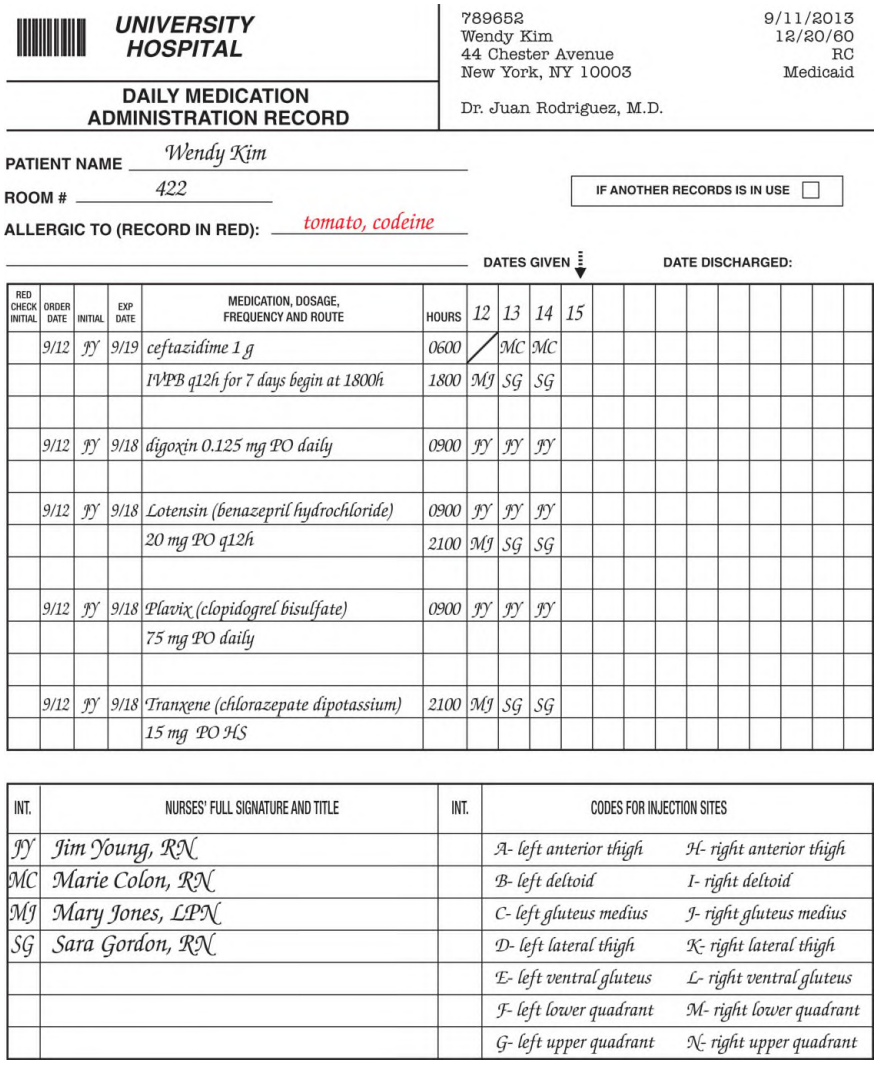
Medical Administration Record

- The MAR is a form (handwritten or computerized) that health care facilities use to document all of the drugs administered to a patient.
  - Routine, PRN, and STAT medications all may be written in separate locations on the MAR.

Medical Administration Record

- The nurse or other healthcare provider transcribes the order to the MAR.
- The healthcare worker initials the time of administration each time a dose is administered with a full name, title, and initials, recorded usually at the end of the MAR.

Figure 2.15 MAR for Wendy Kim.



UNIVERSITY HOSPITAL

DAILY MEDICATION ADMINISTRATION RECORD

789652
Wendy Kim
44 Chester Avenue
New York, NY 10003

9/11/2013
12/20/60
RC
Medicaid

Dr. Juan Rodriguez, M.D.

PATIENT NAME: Wendy Kim
ROOM #: 422
ALLERGIC TO (RECORD IN RED): tomato, codeine

IF ANOTHER RECORDS IS IN USE ☐

DATES GIVEN ▼ DATE DISCHARGED:

RED CHECK INITIAL	ORDER DATE	INITIAL	EXP DATE	MEDICATION, DOSAGE, FREQUENCY AND ROUTE	HOURS	12	13	14	15
	9/12	JY	9/19	ceftazidime 1 g	0600		MC	MC	
				IVPB q12h for 7 days begin at 1800h	1800	MJ	SG	SG	
	9/12	JY	9/18	digoxin 0.125 mg PO daily	0900	JY	JY	JY	
	9/12	JY	9/18	Lotensin (benazepril hydrochloride)	0900	JY	JY	JY	
				20 mg PO q12h	2100	MJ	SG	SG	
	9/12	JY	9/18	Plavix (clopidogrel bisulfate)	0900	JY	JY	JY	
				75 mg PO daily					
	9/12	JY	9/18	Tranxene (chlorazepate dipotassium)	2100	MJ	SG	SG	
				15 mg PO HS					

INT.	NURSES' FULL SIGNATURE AND TITLE	INT.	CODES FOR INJECTION SITES	
JY	Jim Young, RN		A- left anterior thigh	H- right anterior thigh
MC	Marie Colon, RN		B- left deltoid	I- right deltoid
MJ	Mary Jones, LPN		C- left gluteus medius	J- right gluteus medius
SG	Sara Gordon, RN		D- left lateral thigh	K- right lateral thigh
			E- left ventral gluteus	L- right ventral gluteus
			F- left lower quadrant	M- right lower quadrant
			G- left upper quadrant	N- right upper quadrant

Figure 2.18 A portion of a computerized MAR.

SCHEDULED	12/06/14–12/07/14 2301–0700	12/07/14 0701–1500	12/07/14 1501–2300
℞ Cefepime (Maxipime)		0840 2 g IVPB MAB	2015
℞ Emoxaparin Na (Lovenox)		1026 40 mg subcutaneous MAB	
℞ Furosemide (Lasix)	0611 20 mg IVP DJS		
℞ Hetastarch (he SPAN)		0920 250 mL IVPB MAB	
℞ KCl (Potassium chloride)		1026 20 mEq ER tab PO MAB	
℞ Metoprolol XL (Toprol XL)		1000 CANCEL MAB	2200
℞ Metronidazole (Flagyl)	0611 500 mg IVPB DJS	1324 500 mg IVPB MAB	2200
℞ NTG (Nitroglycerin)	0110 15 mg oint topical DJS 0611 15 mg oint topical DJS	1231 15 mg oint topical MAB	1800
℞ Pantoprazole (Protonix) 40 mg IVPB		1026 40 mg IVPB MAB	
PRN	**12/06/14–12/07/14 2301–0700**	**12/07/14 0701–1500**	**12/07/14 1501–2300**
℞ Saline flush	0110 2 mL IV flush DJS	0829 2 mL IV flush MAB	1600
℞ Morphine	0115 4 mg IVP DJS 0439 4 mg IVP DJS	1306 2 mg IVP MAB	
IV	**12/06/14–12/07/14 2301–0700**	**12/07/14 0701–1500**	**12/07/14 1501–2300**
℞ NS (NaCl, 0.9%, 1 L)		0810	2130

PRN ORDERS	
Hydrocodone 5 mg and Acetaminophen 500 mg	x 1–2 tab PO q4h prn process if pain
Saline flush	2 mL IV flush q8 at 0000/0800/1600 and prn
Insulin, human regular sliding scale {Novolin R SS}	See scale prn if BS 200–249 mg/dL give 4 Units of Reg insulin subcut

Drug Labels

NDC 0074-3956-46

Kaletra®

Lopinavir/Ritonavir
Oral Solution

80 mg/20 mg per mL

160 mL

ALERT: Find out about medicines that should NOT be taken with KALETRA

Attention Pharmacist: Do not cover ALERT box with pharmacy label.

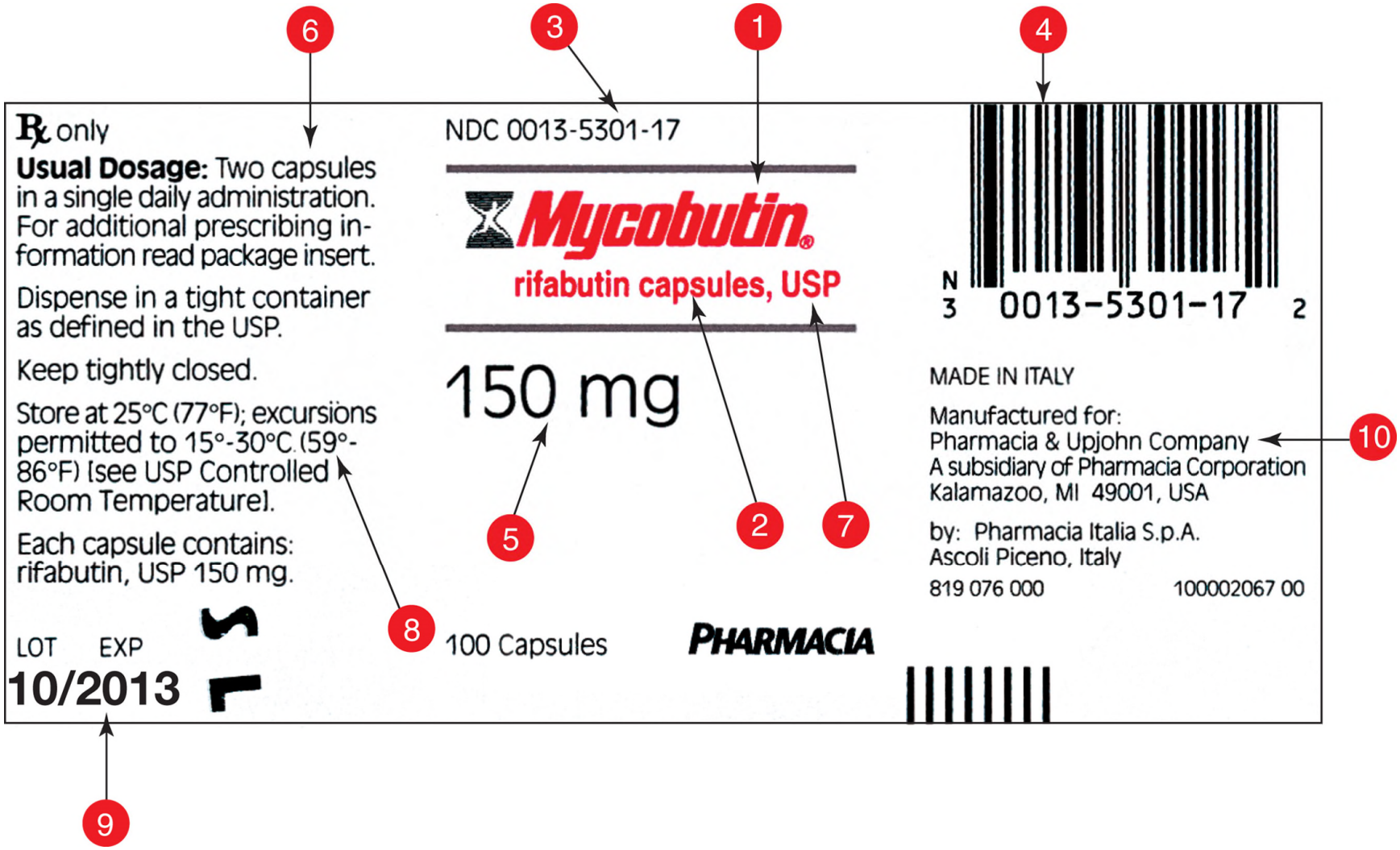
Dispense the enclosed Medication Guide to each patient.

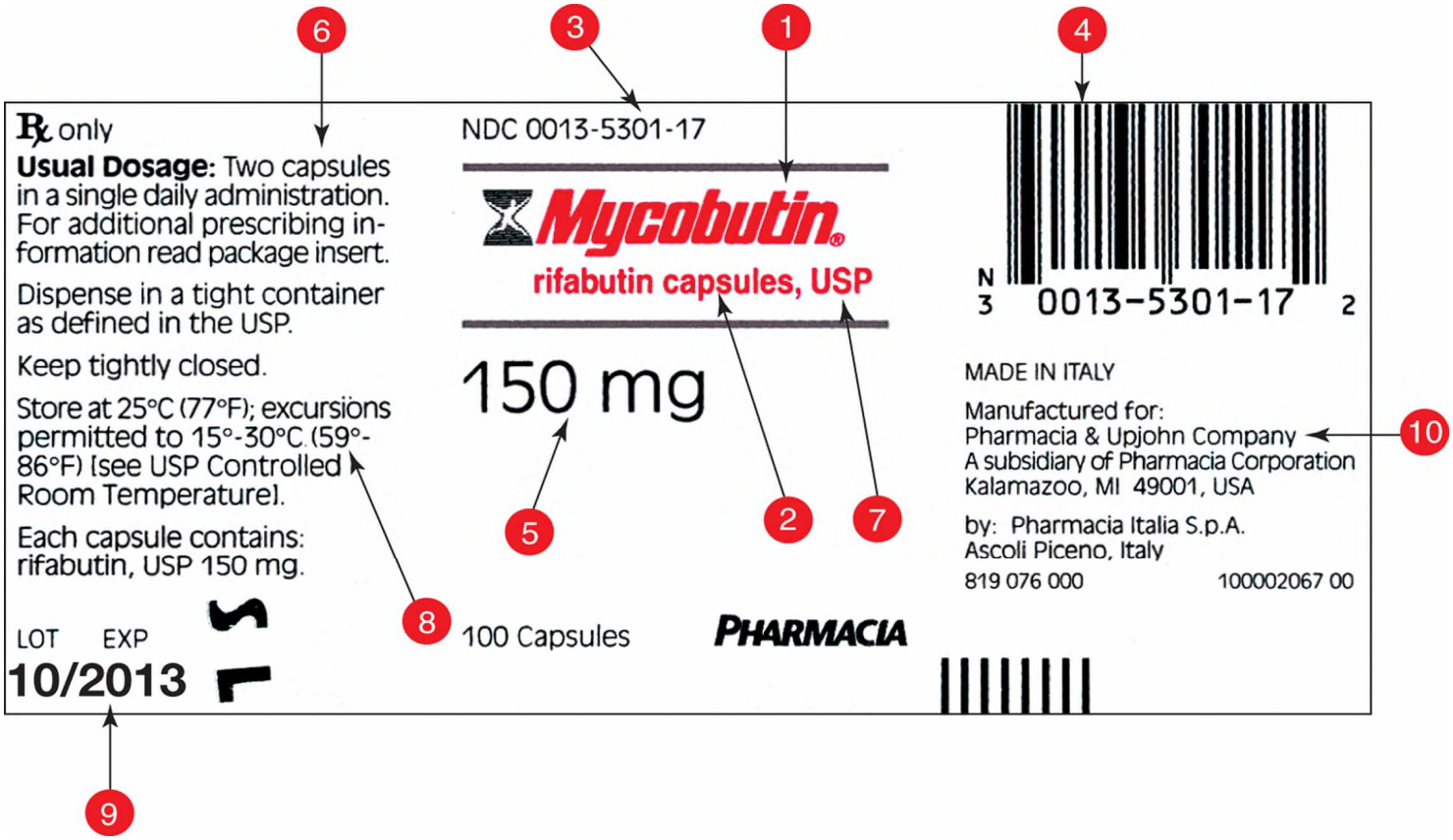
04-A315-2/R4

Rx only

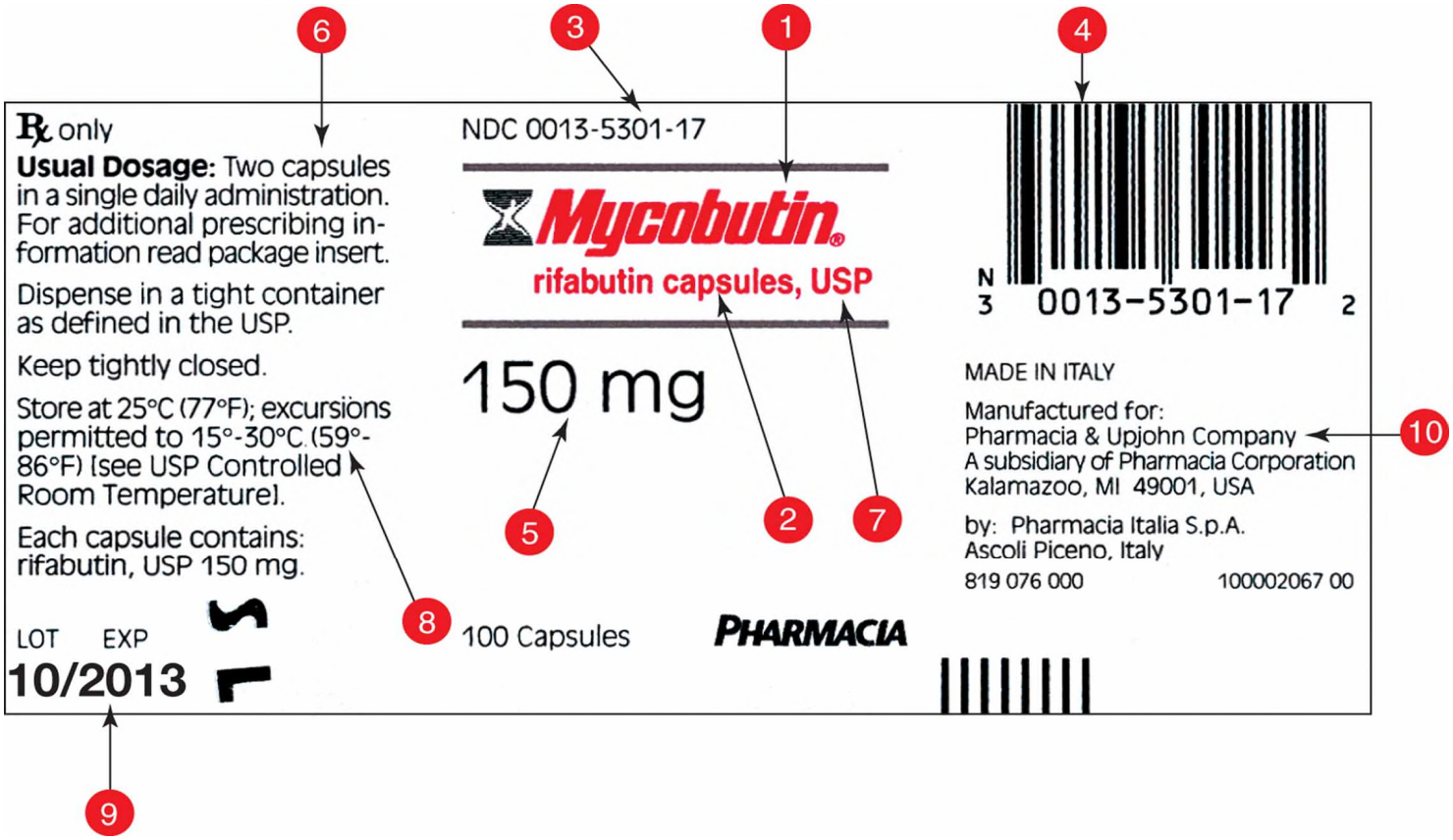
Abbott

Figure 2.19 Drug label for Mycobutin.
(Reg. Trademark of Pfizer Inc. Reproduced with permission.)

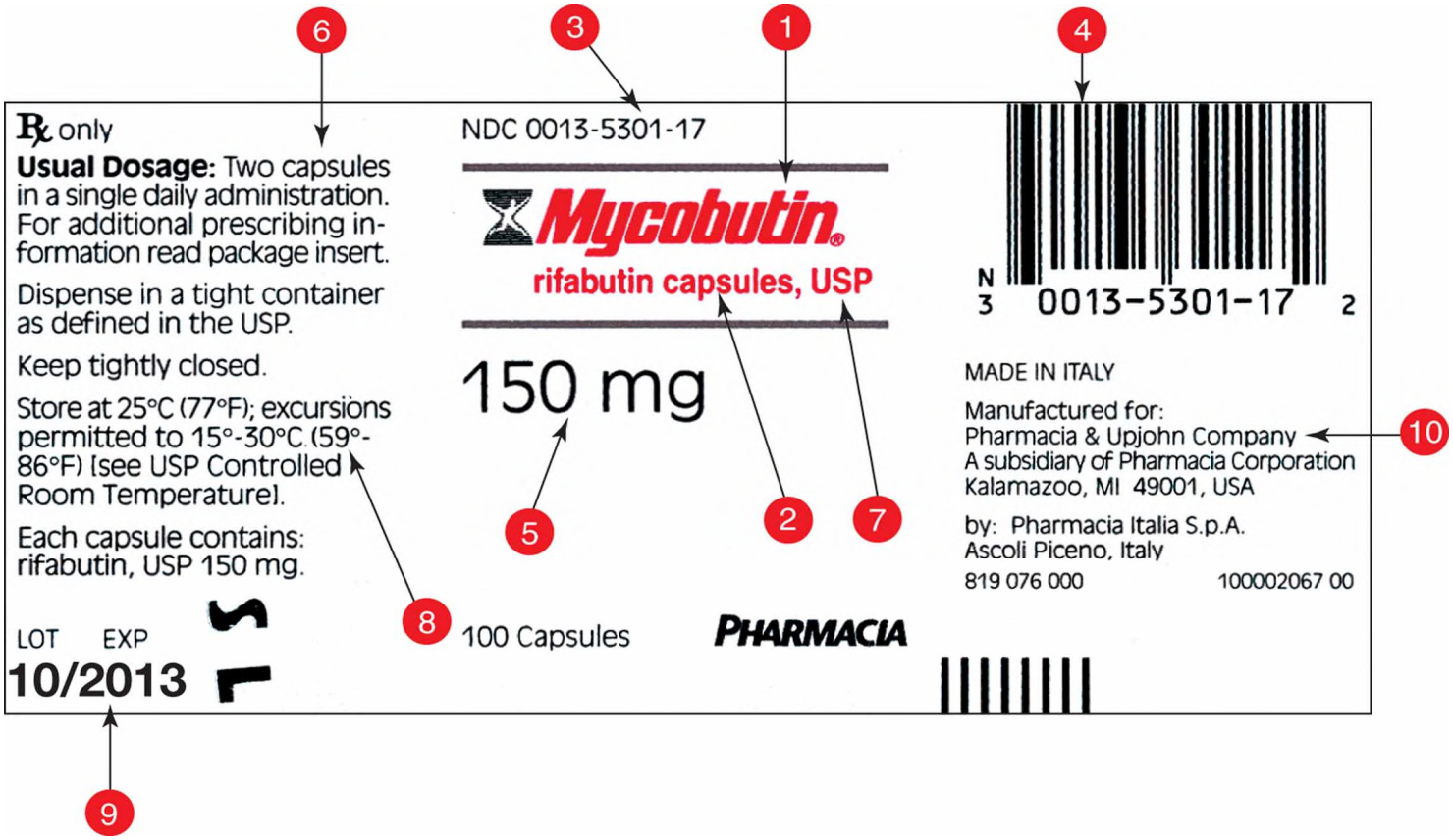




1. *Name of drug*: Mycobutin is the *trade* name.
   The *generic* name is rifabutin, written in lower case letters.
2. *Form of drug*: The drug is in the capsule form.
3. *National Drug Code (NDC) number*: 0013-5301-17.
4. *Bar code*: Has the NDC number encoded in it.
5. *Dosage Strength*: 150 mg of the drug are contained in one capsule.



6. *Dosage recommendations:* 2 capsules in a single daily administration. Note that the manufacturer informs you to read the package insert.
7. *USP:* This drug meets the standards of the United States Pharmacopeia.
8. *Storage directions:* Some drugs have to be stored under controlled conditions if they are to retain their effectiveness. This drug should be stored at 25ºC (77ºF)



9. *Expiration date:* The expiration date specifies when the drug should be discarded. After 10/2008 (October 31, 2008), the drug cannot be dispensed and should be discarded.
10. *Manufacturer:* Pharmacia & Upjohn

Figure 2.20 Drug label for Lexapro.

Figure 2.22 Drug label for Norvir.

Drug Package Inserts

- Sometimes the information needed to safely prepare, administer and store medications is not located on the drug label. In such cases, you may need to read the package insert.

Drug Package Inserts

- The pharmaceutical company includes a package insert with each container of a prescription drug. It may also be found on the pharmaceutical company's web site. The information on a drug package insert is intended for the prescriber, the pharmacist, and the person who administers the drug.

AVODART®
(dutasteride)

Soft Gelatin Capsules

DESCRIPTION

AVODART (dutasteride) is a synthetic 4-azasteroid compound that is a selective inhibitor of both the type 1 and type 2 isoforms of steroid 5α-reductase (5AR), an intracellular enzyme that converts testosterone to 5α-dihydrotestosterone (DHT).

Dutasteride is chemically designated as (5α,17β)-N-{2,5 bis(trifluoromethyl)phenyl}-3-oxo-4-azaandrost-1-ene-17-carboxamide. The empirical formula of dutasteride is C27H30F6N2O2, representing a molecular weight of 528.5 with the following structural formula:

NOHHHHNOHCF3HCF3**

Dutasteride is a white to pale yellow powder with a melting point of 242° to 250° C. It is soluble in ethanol (44 mg/mL), methanol (64 mg/mL), and polyethylene glycol 400 (3 mg/mL), but it is insoluble in water.

AVODART Soft Gelatin Capsules for oral administration contain 0.5 mg of the active ingredient dutasteride in yellow capsules with red print. Each capsule contains 0.5 mg of dutasteride dissolved in a mixture of mono-di-glycerides of caprylic/capric acid and butylated hydroxytoluene. The inactive excipients in the capsule shell are gelatin (from certified BSE-free bovine sources), glycerin, and ferric oxide (yellow). The soft gelatin capsules are printed with edible red ink.

Drug Package Insert Excerpts for AVODART

INDICATIONS AND USAGE

AVODART is indicated for the treatment of symptomatic benign prostatic hyperplasia (BPH) in men with an enlarged prostate to:

- Improve symptoms
- Reduce the risk of acute urinary retention
- Reduce the risk of the need for BPH-related surgery

Drug Package Insert Excerpts for AVODART

CONTRAINDICATIONS

AVODART is contraindicated for use in women and children.

AVODART is contraindicated for patients with known hypersensitivity to dutasteride, other 5α-reductase inhibitors, or any component of the preparation.

PRECAUTIONS

General: Lower urinary tract symptoms of BPH can be indicative of other urological diseases, including prostate cancer. Patients should be assessed to rule out other urological diseases prior to treatment with AVODART. Patients with a large residual urinary volume and/or severely diminished urinary flow may not be good candidates for 5α-reductase inhibitor therapy and should be carefully monitored for obstructive uropathy.

Blood Donation: Men being treated with dutasteride should not donate blood until at least 6 months have passed following their last dose. The purpose of this deferred period is to prevent administration of dutasteride to a pregnant female transfusion recipient.

Use in Hepatic Impairment: The effect of hepatic impairment on dutasteride pharmacokinetics has not been studied. Because dutasteride is extensively metabolized and has a half-life of approximately 5 weeks at steady state, caution should be used in the administration of dutasteride to patients with liver disease.

Drug Package Insert Excerpts for AVODART

Use with Potent CYP3A4 Inhibitors: Although dutasteride is extensively metabolized, no metabolically based drug interaction studies have been conducted. The effect of potent CYP3A4 inhibitors has not been studied. Because of the potential for drug-drug interactions, care should be taken when administering dutasteride to patients taking potent, chronic CYP3A4 enzyme inhibitors (e.g., ritonavir).

Effects on Prostate-Specific Antigen and Prostate Cancer Detection: Digital rectal examinations, as well as other evaluations for prostate cancer, should be performed on patients with BPH prior to initiating therapy with AVODART and periodically thereafter.

Drug Package Insert Excerpts for AVODART

DOSAGE AND ADMINISTRATION

The recommended dose of AVODART is 1 capsule (0.5 mg) taken orally once a day. The capsules should be swallowed whole. AVODART may be administered with or without food.

No dosage adjustment is necessary for subjects with renal impairment or for the elderly (see CLINICAL PHARMACOLOGY: Pharmacokinetics: Special Populations: Geriatric and Renal Impairment). Due to the absence of data in patients with hepatic impairment, no dosage recommendation can be made (see PRECAUTIONS: General).

HOW SUPPLIED

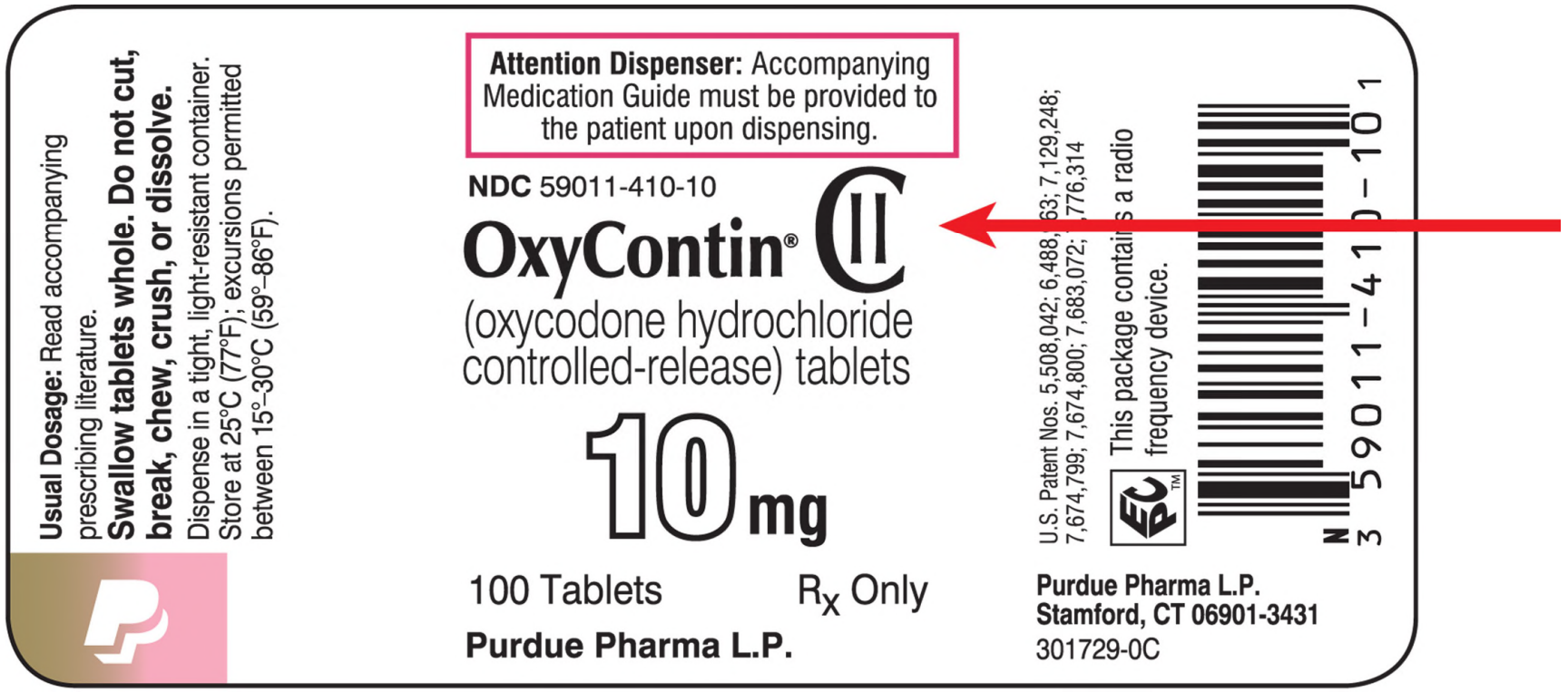
AVODART Soft Gelatin Capsules 0.5 mg are oblong, opaque, dull yellow, gelatin capsules imprinted with "GX CE2" in red ink on one side packaged in bottles of 30 (NDC 0173-0712-15) and 90 (NDC 0173-0712-04) with child-resistant closures.

Storage and Handling: Store at 25° C (77° F); excursions permitted to 15-30° C (59-86° F) [see USP Controlled Room Temperature].

Drug Package Insert Excerpts for AVODART

http://testbanklive.com/download/ratio-and-proportion-dosage-calculations-2nd-edition-giangrasso-solutions-manual/

Figure 2.26 Drug label for OxyContin.



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