

MEDICATION  
ADMINISTRATION  
RECORDS AND  
MEDICATION  
DISTRIBUTION  
SYSTEMS

# Chapter 8

# MARs and Distribution Systems: Objectives

## Learning Objectives:

1. State the components of a medication order. Identify the necessary components of a Medication Administration Record (MAR).
2. Read a MAR and identify medications that are to be administered on a routine basis, including the name of the medication, the dosage, the route of administration, and the time of administration.
3. Identify various medication distribution systems.



# Types of Medication Orders

- During hospital treatment, a physician examines a patient and then writes the first medication order on the patient's **medical chart**
  - ❖ the medical chart is commonly called the *medication administration record*, the *patient's chart* or, simply, the *chart*

# INSTITUTIONAL MEDICATION ORDER EXAMPLES

DOCTOR'S ORDERS		PATIENT IDENTIFICATION	
		099999999	675-01
		SMITH, JOHN	
		12/06/1950	
		DR. P. JOHNSON	
DATE	TIME	DOCTOR'S ORDERS	DATE/TIME INITIALS
1/2/13	0800	Admit patient to 6 <sup>th</sup> floor Pneumonia, Dehydration All: PCN-Rash  Order CBC, chem-7, blood cultures stat NS @ 125ml/hr IV  Dr Johnson x2222	
		DOCTOR'S ORDERS	DATE/TIME INITIALS
1/2/13	0845	Tylenol 650mg po q4-6 hrs PRN for Temp > 38°C  Verbal Order Dr Johnson/Jane Doe, RN	
		DOCTOR'S ORDERS	DATE/TIME INITIALS
1/2/13	0600	Start Clarithromycin 500mg po q12 Multivitamin po daily  Order CXR for this a.m.  Dr Johnson x2222	

COMMUNITY HOSPITAL Medication Administration Record			
Room/Bed: 675-01	From 0730 on 02/01/13 to 0700 on 02/02/13		
Patient: SMITH, JOHN	Diagnosis: PNEUMONIA, DEHYDRATION		
Account #: 099999999	Height: 5'11" weight: 75KG		
Sex: M	Ordered By: <i>Laura Smith, RN</i>		
Age: 48Y			
Doctor: JOHNSON, P.			
Allergies: PENICILLIN -> RASH			
	0730-1530	1600-2300	2330-0700
5% DEXTROSE/0.9% SODIUM CHLORIDE 1 LITER BAG DOSE: 125 ML/HR IV Q 8 HRS ORDER #2	0800 <i>SD</i>	1600 <i>SD</i>	2400
MULTIVITAMIN TABLET DOSE: 1 TABLET PO DAILY ORDER #4	1600 <i>SD</i>		
CLARITHROMYCIN 500 MG TABLET DOSE: 500MG PO Q 12 HRS ORDER #5	1600 <i>SD</i>	2200 <i>SD</i>	
ACETAMINOPHEN 325 MG TABLET DOSE: 650 MG PO Q 4-6 HRS PRN FOR TEMP > 38°C ORDER # 17	0845 <i>SD</i>		
Init / Signature		Init / Signature	
<i>SS, Laura Smith, RN</i>		/	
<i>JD, Jane Doe, RN</i>		/	
/		/	



# Medication Orders

- Medication orders are similar to prescriptions
  - ❖ exclusive to the institutional or hospital setting
- Medication orders entered directly into a computer by the physician are often called **eMARs** (electronic medication administration records)
- Just like other types of prescriptions, medication orders are legal documents that must be filed, usually based on the date the order was written, and kept on hand for up to two years

# Medication Orders

- ▶ Before medications are administered, there **MUST** be an order with:
  - ▶ Client's name
  - ▶ Name of medication
  - ▶ Dosage
  - ▶ Route, frequency, special instructions
  - ▶ Signature of prescriber
- ▶ Computerized prescriber order entry (CPOE)
- ▶ Medication orders are transcribed to the **Medication Administration Record (MAR)**.

# Ideal Medication Order

- Patient name
- Hospital identification #
- Room/bed location
- Generic drug name
- Brand drug name\*
- Route of administration
- Dosage form
- Dose/strength
- Frequency & duration
- Rate & time
- Indication
- Other instructions
- Prescriber's signature
- Printed name if needed
- Credentials
- Pager number
- Date & time of order

# Medication Administration Records

- ▶ Handwritten or electronic (eMAR) form used to document meds client has and will receive
- ▶ Method of charting varies per institution.
- ▶ MAR is also used to document patient refusals, delays in administration, and med responses.

Use MAR to:

- Check the med order
- Prepare the correct dosage
- Record the medication administered

# Documentation of Meds Administered

- ▶ Complete schedule written or in computer
- ▶ Initialed or computer signed in appropriate area by med administrator IMMEDIATELY after administration
- ▶ One-time doses
- ▶ PRN doses (may be a different record)
- ▶ Refused or held meds (special symbols may correspond to legend)

Remember:  
**If it wasn't documented, it wasn't done**

## SCHOOL MEDICATION ADMINISTRATION RECORD

Student \_\_\_\_\_ DOB \_\_\_\_\_ Grade \_\_\_\_\_ School \_\_\_\_\_ Year \_\_\_\_\_

Teacher Name/Phone \_\_\_\_\_ School Nurse Name/Phone \_\_\_\_\_

Medication \_\_\_\_\_ Dose \_\_\_\_\_ Days \_\_\_\_\_ Time \_\_\_\_\_ Route \_\_\_\_\_

Order from \_\_\_\_\_  Daily Med  PRN Med  Inhaler Physician Name/Phone \_\_\_\_\_

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Aug																																	
Sept																																	
Oct																																	
Nov																																	
Dec																																	
Jan																																	
Feb																																	
March																																	
April																																	
May																																	
June																																	
July																																	

Sample

Name	Initials	Date	Legend
_____	_____	_____	<b>Legend</b> A Absent      F Field Trip      S Snow Day B Daily Med    H Holiday            W Withheld Med C Dose Change   M Missed Dose    X No School D Discontinued   N New Available E Early Discontin   R Refill Needed
_____	_____		
_____	_____		
_____	_____		
_____	_____		

**Six Rights of Safe Medication Administration**

- Right Patient
- Right Medication
- Right Route
- Right Time
- Right Dose/Amount

# RIGHTS OF MEDICATION ADMINISTRATION

- 1) **Right Patient**
- 2) **Right Medication**
- 3) **Right Dosage**
- 4) **Right Route**
- 5) **Right Time**
- 6) **Right Documentation**
- 7) **Right Client Education**
- 8) **Right to Refuse**
- 9) **Right Assessment**
- 10) **Right Evaluation**

# **RIGHTS OF MEDICATION**

## **ADMINISTRATION**

- 1) Right Patient**
- 2) Right Medication**
- 3) Right Dosage**
- 4) Right Route**
- 5) Right Time**
- 6) Right Documentation**

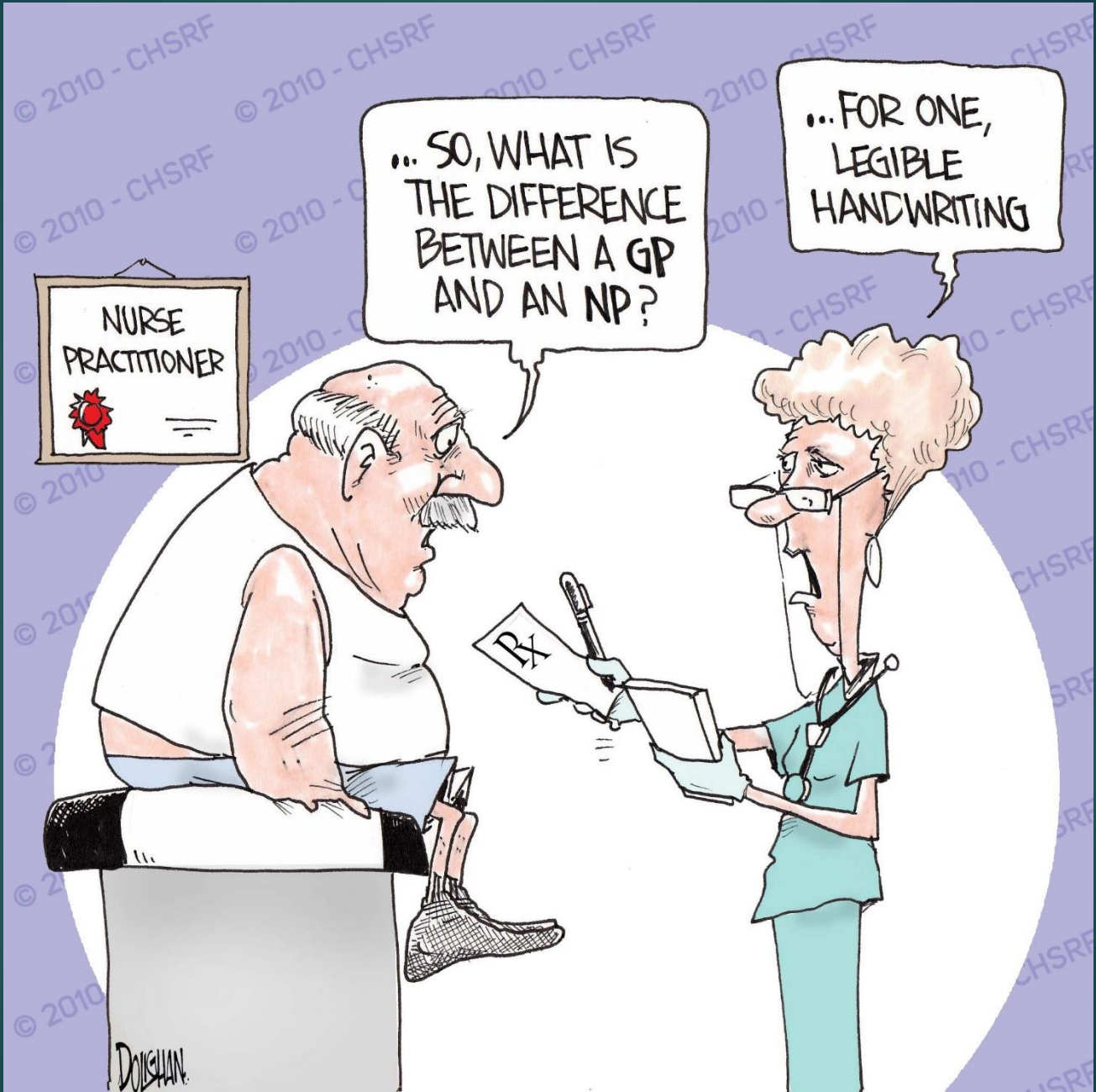
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- 7) Right Client Education**
- 8) Right to Refuse**
- 9) Right Assessment**
- 10) Right Evaluation**

# Documentation: Sixth “Right”

SPECIAL CONSIDERATIONS to avoid errors:

- ▶ Transcribe carefully.
- ▶ Document immediately after medication administration.
- ▶ Document accurately.
- ▶ Document legibly.
- ▶ Document timely.
- ▶ MAR is a legal record.
- ▶ MAR is verified against orders daily.



... SO, WHAT IS THE DIFFERENCE BETWEEN A GP AND AN NP?

... FOR ONE, LEGIBLE HANDWRITING

NURSE PRACTITIONER

DOUGLAS

DEPARTMENT OF NURSING  
 MEDICATION ADMINISTRATION RECORD

Identifying Client Information (Name,  
 Room Number, Date of Birth, Medical  
 Record Number)

Diagnosis:
<b>ALLERGIES: NKDA</b> <span style="float: right;">Date: 4/2/2017</span>

Order Date	Exp. Date	RN Initial	Medication-Dosage, Frequency, Route	Date 2017	4/2	4/3	4/4	4/5	4/6	4/7	4/8
					Time	Initial	Initial	Initial	Initial	Initial	Initial
4/2/17	5/2/17	DG	Colace 100 mg po bid	0900	DG	JN					
				1700	NN	NN					
4/2/17	5/2/17	DG	Furosemide 40 mg po daily	0900	DG						
4/2/17	5/2/17	DG	K - Dur 10 mEq po bid	0900	DG	JN					
				1700	NN	NN					
4/2/17	5/2/17	DG	Digoxin 0.125 mg po daily	0900	DG	JN					
				Check apical pulse (AP)	AP	76	80				
			Hold if less than 60 or above 100 beats per minute (bpm)								

	Initial	Print Name/Title		Initial	Print Name/Title		Initial	Print Name/Title
1	DG	Deborah Gray RN	5				9	
2	NN	Nancy Nurse RN	6				10	
3	JN	Jane Nightingale RN	7				11	
4			8				12	

Medication administration record (MAR). Note: This MAR is intended to show the basic information that would be included in an MAR.



# Explanation of MAR

- ▶ MAR is always verified with the prescriber's order.
- ▶ Despite variety in forms, contain the same essential information
  - ▶ Name of the client and pertinent data related to the client
  - ▶ Medication (dosage, route)
  - ▶ Time/frequency desired for administration
  - ▶ Allergies
  - ▶ Date, administrator, initial and/or name

# Essential Components on an MAR

- ▶ Client information
  - ▶ Name, DOB, medical record #, ALLERGIES
- ▶ Dates (when written, start and stop)
- ▶ Medication information
- ▶ Time of administration
- ▶ Initials (transcriber, person giving med)
- ▶ Special instructions
  - ▶ Data such as BP, “Hold if ...,” etc. (For metoprolol)
- ▶ Legends—describe abbreviations



Before administering  
any medication...



**STOP!**

# Three Checks of Drug Administration

- Checking the drug with the MAR or the medication information system when pulling it from storage
- Checking the drug when preparing it, pouring it, taking it out of the unit-dose container, or connecting the IV tubing to the bag
- Checking the drug before administering it to the patient

# Case Study

You have new orders to discontinue the NGT and advance Mr. Ross's diet from NPO status to clear liquids as tolerated. The physician writes the order:

*Phenergan Supp 12.5 mg PR q4h prn nausea*

After pharmacy transcribes the order, you compare the MAR with the order to verify. What components do you expect to see when reviewing the MAR?

# Case Study (Cont.)

ANS:

- ▶ Mr. Ross's full Name, DOB, medical record #, **ALLERGIES**
- ▶ Today's date
- ▶ Medication information
- ▶ Time of administration
- ▶ Initials (transcriber, person giving med)
- ▶ Special instructions
- ▶ Legends—describe abbreviations

MED ALERT!  
Avoid giving Phenergan IV because it may cause severe tissue injury

FRIDAY 10/12/12 - 0700 thru SATURDAY 10/13/12 - 0659

ST ANNE HOSPITAL  
 MEDICATION ADMINISTRATION RECORD  
 Acct#: \_\_\_\_\_ Page: 1  
 Attending Dr: Thomas Smith, MD  
 Run Date/Time: 10/12/12 - 2237  
 DOB: 06/23/1934

Meyer, Lois M. Unit#: \_\_\_\_\_  
 WESOF W303-2 Admitted: 10/12/12  
 Age: 78 Sex: F Ht: 152.40 cm Wt: kg  
 Primary Dx: CP

ALLERGIES: Drug: PCN. ERYTHROMYCIN. IV DYE  
 Other: NO ALLERGIES RECORDED  
 Pharmacy: IODINE (INCLUDES RADIOPAQUE AGENTS W/IODINE). MACROLIDE ANTIBIOTICS, PENICILLINS

Init	IV Flushes: Routine	0700-1459	1500-2259	2300-0659
	<b>Sodium Chloride 0.9% IV</b> Flush peripheral IV lines with 5 mls 0.9 NS q 8 hours and central lines per protocol.	Time _____ Init _____ # Flushed _____	Time _____ Init _____ # Flushed _____	Time _____ Init _____ # Flushed _____

Init	SCHED MEDS	DOSE	0700-1459	1500-2259	2300-0659
	<b>DOCUSATE SODIUM</b> (DOCUSATE SODIUM) START: 10/12 D/C: 11/11/12 AT 2244	<b>100 MG</b> PO Q12 RX 002306792			
	<b>PRAVACHOL</b> (PRAVASTATIN SODIUM) Give at: BEDTIME START: 10/12 D/C: 11/11/12 AT 2244	<b>80 MG</b> PO RX 002306793			
	<b>METOPROLOL TARTRATE</b> (METOPROLOL TARTRATE) HOLD FOR SBP<110 OR HR<55 Check apical rate and BP before drug admin. START: 10/12 D/C: 11/11/12 AT 2244	<b>50 MG</b> PO Q12 RX 002306794			
	<b>ACCUPRIL</b> (QUINAPRIL HCL) HOLD FOR SBP<120 START: 10/12 D/C: 11/11/12 AT 2244	<b>40 MG</b> PO Q12 RX 002306795			
	<b>NITROGLYCERIN 2%</b> (NITROGLYCERIN 2%) HOLD FOR SBP<100 START: 10/12 D/C: 11/11/12 AT 2244	<b>1 INCH</b> TP Q6 RX 002306796			0000 0600
	<b>ALPRAZOLAM</b> (ALPRAZOLAM) START: 10/12 D/C: 10/14/12 AT 1601	<b>0.25 MG</b> PO Q8 RX 002306791			0000

Init	PRN MEDS	DOSE	0700-1459	1500-2259	2300-0659
	<b>NITROSTAT 25 TABS/BOTTLE</b> (NITROGLYCERIN) Chest discomfort. May repeat q 5 min x 3. If no relief after 3 doses. Stat ECG & call Physician. START: 10/12 D/C: 11/11/12 at 1833	<b>0.4 MG</b> SL STAT RX 002306718 PRN			

# Use of Computers

- ▶ Handwritten transcription and documentation are common causes of med errors.
- ▶ Goal is to eliminate errors and keep electronic records.
- ▶ Systems utilize Computerized Prescriber Order Entry (CPOE) and electronic Medicine Administration Record (MAR.)
- ▶ Speaks to two QSEN competencies: safety to reduce risk of harm to clients, and the use of technology to mitigate errors

**NURSING  
SCIENCE**

**NURSING  
INFORMATICS**

**COMPUTER  
SCIENCE**

**INFORMATION  
SCIENCE**

# This is the eMAR, the electronic Medication Admistration Record.

PHA, HHH (B/TEST.5.61.MIS/74/HHH) - SUPERVISOR, NURSE

eMAR Desktop Total # orders 6

FANTASTIC, I AM 01/01/01 V00000000097/M00000063 MAS 302-1 ADM IN  
 6/F 01/01/01 No Height or Weight entered. CrCl No Results on File

Allergy PLEASE ENTER PATIENT'S ALLERGIES. AdvReac

Thursday August 2, 2007 1141

A	Start	Medication	Sched Time	Today		
				Wed	Thu	Fri
✓	08/01/07 1400	Ud Albuterol Sulfate N... 1 each IH Q4H Ud Albuter... (Give 1 VIAL.NEB. of ...)		1400 1800 2200	0200 0600 1000 1400 1800 2200	0200 0600 1000 1400 1800 2200
	Active New Order					
	08/01/07 1600	Albuterol Sulfate/Iprat... 3 ml IH Q4H Albuterol Sulfa... (Give 1 SOL of 3 ml)		1600 2000	0000 0400 0800 1200 1600 2000	0000 0400 0800 1200 1600 2000
	Active New Order					
	08/01/07 1345	Warfarin Sodium 3 mg PO 1600 Warfarin Sodium (Give 1 TABLET of 3 mg) HIGH ALERT MEDICATION		1600	1600	1600
	Active New Order					

Document | Ack | Preferences | Drug Data | eMAR Reports | Change Order | Other | Submit

# eMAR

## (Electronic-Medication Administration Record)

### Provides Detailed Information

To improve efficiency and safety

- Start and Stop Dates
- List Trade and Generic name
- List dosage, route, and frequency.
- List when the medication was last given.
- List when the medication is next scheduled.

### Associated Data

- The user can access related information from nursing assessments and labs.

### Monograph

- Detailed information regarding the use of the medication.

The screenshot displays the eMAR software interface. At the top, it shows the patient's name 'Test Record' and the date '001 08-11-2010 08:57'. Below this, there are several rows of medication administration records. Each row includes a date, a medication name (e.g., 'MORPHINE SULFATE CONTROLLED SUBSTANCE'), a dosage (e.g., '4 MG'), a route (e.g., 'PO'), and a frequency (e.g., 'Q4H'). The interface also features a sidebar on the right with various navigation options and a bottom toolbar with icons for search, print, and other functions.

Date	Medication	Dose	Route	Frequency	Time	Status
08/11/2010	MORPHINE SULFATE CONTROLLED SUBSTANCE	4 MG	PO	Q4H	08:00	OK
08/11/2010	MORPHINE SULFATE CONTROLLED SUBSTANCE	4 MG	PO	Q4H	12:00	OK
08/11/2010	MORPHINE SULFATE CONTROLLED SUBSTANCE	4 MG	PO	Q4H	16:00	OK
08/11/2010	MORPHINE SULFATE CONTROLLED SUBSTANCE	4 MG	PO	Q4H	20:00	OK

# “YOU DID NOT SCAN” WARNING

The screenshot shows the eMAR Desktop interface. At the top, it displays patient information: KABUKI, DOLL, 26/F, 06/15/86, and physical characteristics: 167.64 cm, 75 kg, 1.88 m2. It also shows a medication order for Denadex 10 mg PO BID. A 'Text' dropdown menu is highlighted with a red circle. A 'Yes/No Confirmation' dialog box is open, asking 'You did not scan the medication. Do you want to do so now?' with 'Yes' and 'No' buttons. The background shows a list of medication orders with columns for Start, Stop, Status, Administration, Dose, Units, and User.

You will see this pop-up screen if you attempt to file documentation on a medication that has not been scanned.

Please note that you may choose to continue to document without scanning.

Remember to notify pharmacy and enter a comment in the text box if you are unable to scan a medication.

# Medication Distribution Systems

## ▶ **Unit dose**

- ▶ Prepared daily and sent to unit
- ▶ Packages provide a single dosage of medication.
- ▶ Not available for all products

## ▶ **Computer-controlled dispensing**

- ▶ Automated dispensing system (ADS)
- ▶ Detailed transaction records
- ▶ Linked to pharmacy dispensing system

## ▶ **Bar-code medication delivery**

- ▶ Studies show errors reduced by 65%-86%.
- ▶ Verifies 5 rights:
  - ▶ CLIENT, MED, DOSE, ROUTE, TIME



Unit dose cabinet



PYXIS Machine









NURSE JACKIE💊

# Controlled Substances Act, 1970

## Five Schedules:

- **Schedule I** drugs carry the most severe penalties; considered to have a “high potential for abuse” and have “no accepted medical use”
- **Schedule II** drugs have a high potential for abuse but have an accepted medical use
- **Schedules III – V** have an accepted medical use and decrease in potential for abuse

# Drug Scheduling Guide United States

**Schedule I** Most potential for abuse and dependence  
No medicinal qualities  
Heroin, LSD, Marijuana, Ecstasy, Peyote

**Schedule II** High potential for abuse and dependence  
Some medicinal qualities  
Vicodin, Cocaine, Meth, OxyContin, Adderall

**Schedule III** Moderate potential for abuse/dependence  
Acceptable medicinal qualities  
Doctor's prescription required  
Tylenol with Codeine, Ketamine, Steroids, Testosterone

**Schedule IV** Low potential for abuse and dependence  
Acceptable medicinal qualities  
Prescription required - fewer refill regulations  
Xanax, Darvon, Valium, Ativan, Ambien, Tramadol

**Schedule V** Lowest potential for abuse/dependence  
Acceptable medicinal qualities  
Prescription required - fewest refill regulations  
Robitussin AC, Lomotil, Motofen, Lyrica

Source: United States Drug Enforcement Agency

## Hierarchy of drugs controlled by the DEA

Drugs are classified into five categories, or schedules, by the federal Controlled Substance Act. Schedule I drugs are considered the most dangerous; Schedule V drugs are the least harmful ones to fall under the law. The higher the schedule, the more restrictions are placed on a drug.

**Schedule I** Drugs with no currently accepted medical use under federal law and with the highest potential for abuse. Some examples are heroin, LSD, marijuana, ecstasy, methaqualone and peyote.

**Schedule II** Drugs with a high potential for abuse and the most risky of those accepted for medical use. Some examples are cocaine, methamphetamine, methadone, Dilaudid, Demerol, oxycodone (which includes OxyContin and Percocet), fentanyl, Dexedrine, Adderall and Ritalin.

**Schedule III** Drugs with a moderate to low potential for physical and psychological dependence. Some examples are **hydrocodone combination products\*** with less than 15 milligrams of hydrocodone per dose (including Vicodin and Lortab), drugs containing less than 90 milligrams of codeine per dose (Tylenol with codeine), ketamine, anabolic steroids and testosterone.

*\*Hydrocodone-based drugs are being reclassified*

**Schedule IV** Drugs with a low potential for abuse and low risk of dependence. Some examples are Xanax, Soma, Darvon, Darvocet, Valium, Ativan, Talwin, and Ambien.

**Schedule V** Drugs with a lower potential for abuse than Schedule IV and consisting of preparations containing limited quantities of certain narcotics. Some examples are cough medications with less than 200 milligrams of codeine or per 100 milliliters (Robitussin AC), Lomotil, Motofen, Lyrica, and Parepectolin.



# Black Box Warning Labels

# PROZAC

## Pharmaceutical Fats



Pharmwar © Created by Silvi Hoxha - Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)

The boxed warning (also known as ‘black box warning [BBW]’) is one of the strongest drug safety actions that the U.S. Food & Drug Administration (FDA) can implement, and often warns of serious risks



### **WARNING: SUICIDAL THOUGHTS AND BEHAVIORS**

*See full prescribing information for complete boxed warning.*

- Increased risk of suicidal thinking and behavior in children, adolescents, and young adults taking antidepressants (5.1).
- Monitor for worsening and emergence of suicidal thoughts and behaviors (5.1).

*When using PROZAC and olanzapine in combination, also refer to Boxed Warning section of the package insert for Symbyax.*

## **WARNINGS AND PRECAUTIONS**

### **Serious Warnings and Precautions**

- A higher number of deaths was seen in a study of gout patients with heart problems who were treated with ULORIC<sup>®</sup>. This was compared to patients treated with allopurinol.
- Your doctor will consider the side effects and benefits of ULORIC<sup>®</sup> before and during your treatment. ULORIC<sup>®</sup> should only be used when allopurinol has not worked well enough or when allopurinol is not right for you.

## ***Warnings***

**Ask a doctor before use if you have**

- glaucoma
- a breathing problem such as emphysema or chronic bronchitis
- trouble urinating due to an enlarged prostate gland

---

**Ask a doctor or pharmacist before use if you are taking tranquilizers or sedatives**

---

**When using this product**

- drowsiness may occur
- avoid alcoholic drinks
- alcohol, sedatives, and tranquilizers may increase drowsiness
- be careful when driving a motor vehicle or operating machinery
- excitability may occur, especially in children

---

**If pregnant or breast-feeding, ask a health professional before use.**

**Keep out of reach of children. In case of overdose, get medical help or contact a Poison Control Center right away.**

# RISPERDAL

**WARNING: INCREASED MORTALITY IN ELDERLY PATIENTS  
WITH DEMENTIA-RELATED PSYCHOSIS**

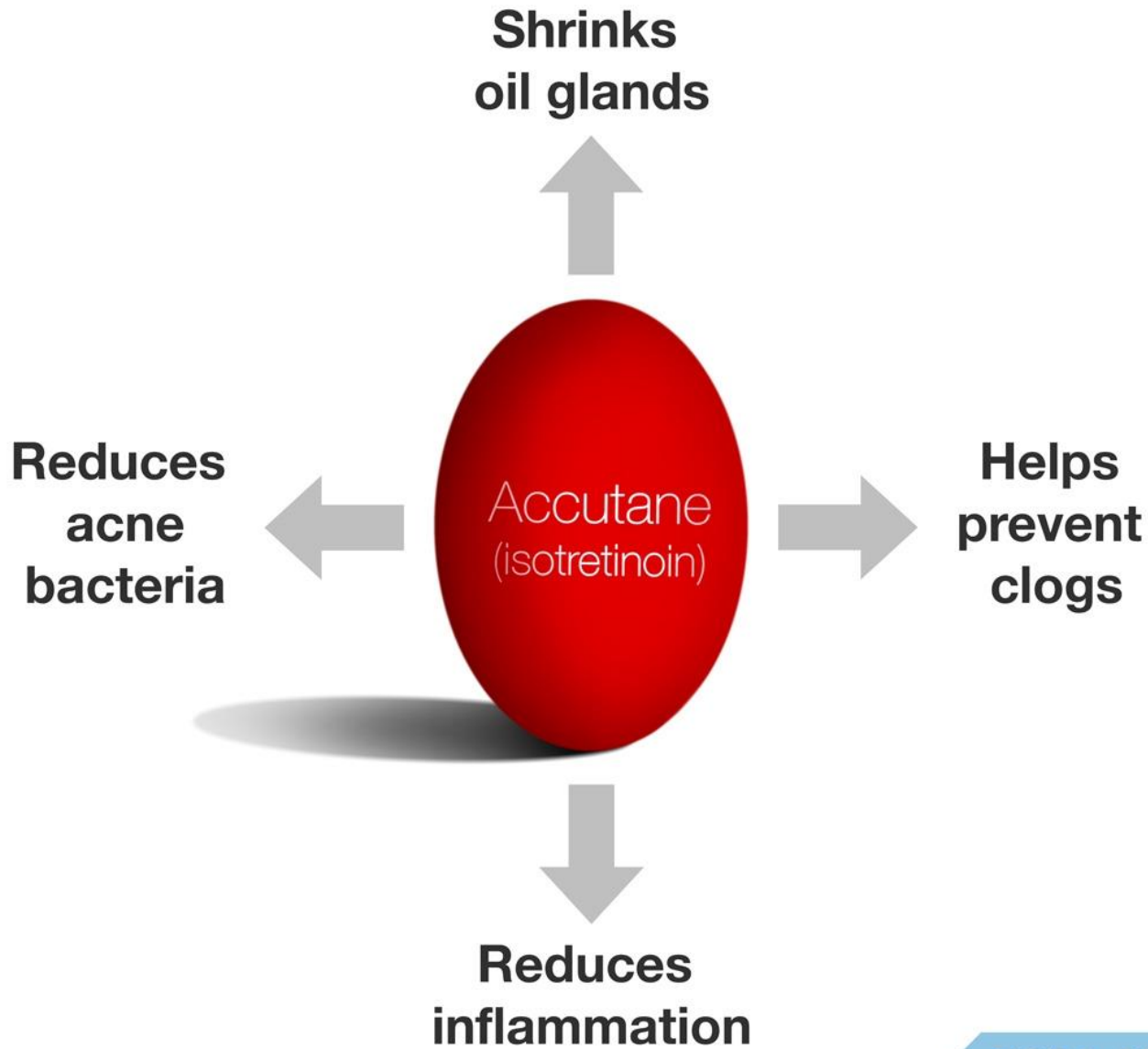
*See full prescribing information for complete boxed warning.*

Elderly patients with dementia-related psychosis treated with antipsychotic drugs are at an increased risk of death. RISPERDAL<sup>®</sup> is not approved for use in patients with dementia-related psychosis. (5.1)



Isotretinoin permanently changes the body. Use extreme caution when deciding to embark on an isotretinoin course.

# Cure Rate = 66%





**BEFORE**

**AFTER 3 mos.**

# ACCUTANE RESULTS





**EXTREME  
WARNING:**

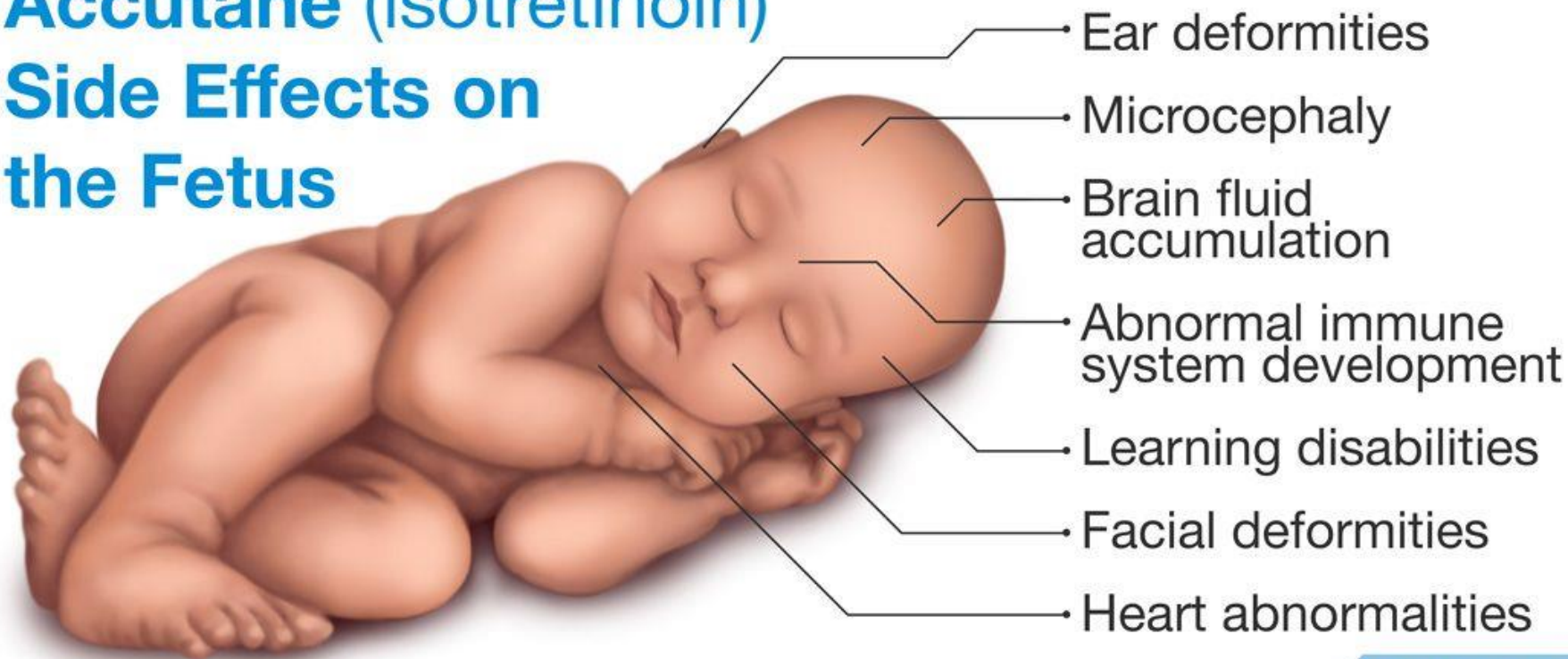
Accutane (isotretinoin)  
Causes **Birth Defects**

# Black box warning

50

- ▶ **Isotretinoin** carries a **black box** warning for birth defects.
- ▶ This medication should not be used by females who are or may become pregnant.
- ▶ Must be on birth control
- ▶ Must have continuous pregnancy tests

## Accutane (isotretinoin) Side Effects on the Fetus



Normal head size



Microcephaly







Photo example of baby born from Isotretinoin patient (source: <http://businessethicscases.blogspot.com>)

# Thalidomide





**Dr. Frances Oldham Kelsey**

# Thalidomide caused Phocomelia







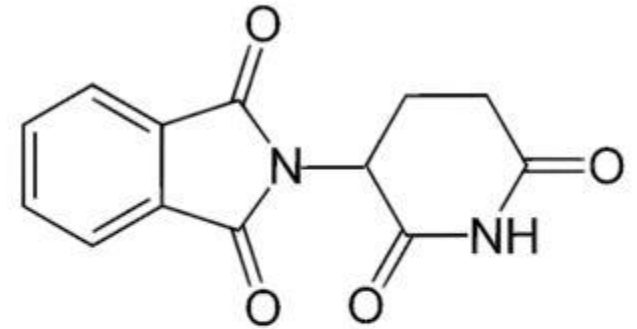
# Frances Oldham Kelsey

**“Her exceptional judgment in evaluating a new drug for safety for human use has prevented a major tragedy of birth deformities in the United States.” - President John F. Kennedy**



# Thalidomide and Leprosy

Thalidomide is used in the treatment of Erythema nodosum leprosum (ENL), a painful inflammatory dermatologic reaction of leprosy



Before



200 mg 1 week



200 mg 6 weeks



**Omnicell<sup>®</sup>**







Omnicell

TYLENOL  
EXTRA  
STRENGTH



Bar code for unit drug dose. (From Kee JL, Marshall SM: *Clinical calculations: with applications to general and specialty areas*, ed 8, St Louis, 2016, Saunders.)



Bar code reader. (From Kee JL, Marshall SM: *Clinical calculations: with applications to general and specialty areas*, ed 8, St Louis, 2016, Saunders.)

# Nursing Considerations: Medication Administration Safety

## Three Checks

- Before you pour
  - Check the medication label against the MAR
- After you pour
  - Verify the label against the MAR
- At the bedside
  - Check the medication again

# Case Study 3

Mr. Ross is feeling nauseous after a popsicle and apple juice. You decide to medicate per MD order.

(Phenergan Supp 12.5 mg PR q4h prn nausea)

The facility where you work uses an eMAR with Bar-Code Medication Delivery system. What are the 6 rights you will check when scanning bar codes on Mr. Ross' wristband and on the medication?

# Case Study 3 (Cont.)

ANS:

1. Client—2 identifiers  
Mr. Jared Ross, DOB 01/02/1951
2. Medication—Phenergan Suppository
3. Dosage—12.5 mg
4. Route—PR (rectal)
5. Time—now
6. Documentation

# Advantages and Disadvantages of Technology

- ▶ Designed to prevent med errors
- ▶ Provides safeguards
- ▶ Should NOT substitute for knowledge of the practitioner
- ▶ **Should NOT eliminate the taking of basic safety precautions**

# Advantages and Disadvantages of Technology (Cont.)

## ▶ Advantages

- ▶ Improves accuracy and efficiency
- ▶ Safeguards the 6 rights (especially Bar-Code)
- ▶ Records can be readily accessed.

## ▶ Disadvantages

- ▶ Human component in USE of system
- ▶ Human component in RELYING solely on system
- ▶ Requires extensive up-front design and use planning

# Scheduling Times

**TABLE 12-1** Commonly Used Abbreviations for Scheduling Medications

<b>Abbreviation</b>	<b>Meaning</b>
a.c.*	before meals
b.i.d	twice a day
p.c.*	after meals
p.r.n.	as needed (when necessary/required)
q	every
q.h.	every hour
q2h, q3h, q4h	every 2 hours, 3 hours, 4 hours
q6h, q8h, q12h, q24h	every 6 hours, 8 hours, 12 hours, 24 hours
q.i.d.	four times a day
stat	immediately (at once), now
t.i.d.	three times a day

\*Based on mealtimes.

# Military Time

- ▶ The FDA recommends the use of military time when documenting the administration of medications on the MAR.
- ▶ Day begins after 0000 and ends at 2400 (which is 12 midnight).
- ▶ To convert am, omit the colon and am and ensure that a 4-digit number is written, adding a zero in the beginning as needed.
- ▶ For each hour beginning with 1 pm standard time, add 12 hours to convert to military.



# Practice Problems

1. List three uses for the MAR.
2. What types of systems are the Pyxis and Omnicel?
3. What does CPOE stand for?
4. What do the following scheduling abbreviations mean?
  - a. p.c.
  - b. a.c.
  - c. qh

# Practice Problems

1. List three uses for the MAR.

**Check the order**

**Prepare the correct dose**

**Record administration after giving**

2. What types of systems are the Pyxis and Omnicel?
3. What does CPOE stand for?
4. What do the following scheduling abbreviations mean?
  - a. p.c.
  - b. a.c.
  - c. qh

# Practice Problems

1. List three uses for the MAR.

**Check the order**

**Prepare the correct dose**

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2. What types of systems are the Pyxis and Omnicel?  
**Computer controlled dispensing or automated dispensing**
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# Practice Problems

1. List three uses for the MAR.

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**Computer controlled dispensing or automated dispensing**

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**Computerized Prescriber Order Entry**

4. What do the following scheduling abbreviations mean?

a. p.c.

b. a.c.

c. qh

# Practice Problems

1. List three uses for the MAR.

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**Record after administration**

2. What types of systems are the Pyxis and Omnicel?

**Computer controlled dispensing or automated dispensing**

3. What does CPOE stand for?

**Computerized Prescriber Order Entry**

4. What do the following scheduling abbreviations mean?

a. p.c. – **after meals**

b. a.c. – **before meals**

c. qh – **every hour**

# Oral Medications

# Background

- ▶ Enteral: meds administered directly into GI tract
  - ▶ Oral, rectal, through tube (NGT, PEG Tube)
- ▶ Oral Medications:
  - ▶ Most economical
  - ▶ Easiest to administer
  - ▶ Most common type of medication given
  - ▶ Available as solids and liquids
  - ▶ Unit dose and bulk packaging
  - ▶ Usually simple calculations

# Forms of Solid Medications

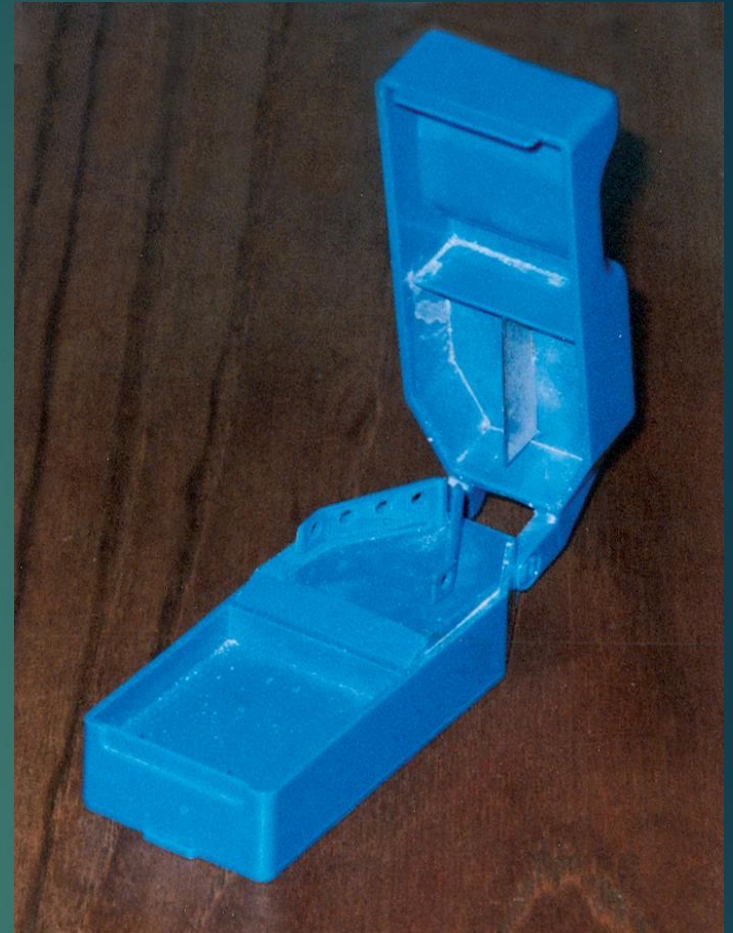
- ▶ Tablets
  - ▶ Powdered medications molded in shapes
- ▶ Caplets
  - ▶ Elongated tablets coated to ease swallowing
- ▶ Scored tablets—use pill cutter
  - ▶ Tablets with indented markings designed to cut and deliver  $\frac{1}{2}$  or  $\frac{1}{4}$  what is in a whole tablet

**SAFETY ALERT!** 

Breaking an unscored tablet is dangerous  
and can result in an unintended dose.



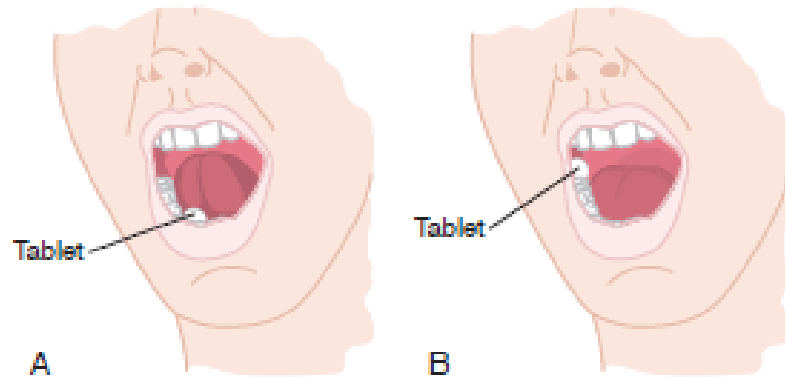
**Figure 17-1** Clonazepam tablet scored.



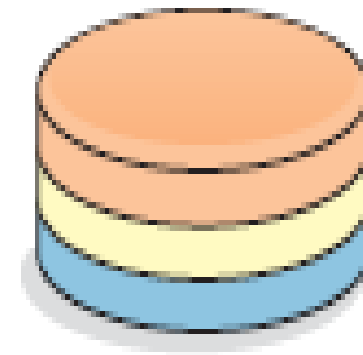
**Figure 17-2** Pill/tablet cutter. (From Kee JL, Marshall SM: *Clinical calculations: with applications to general and specialty areas*, ed 8, St Louis, 2016, Saunders.)

# Forms of Solid Medications (Cont.)

- ▶ Enteric-coated tablets and film tablets
  - ▶ Special coating protects against gastric secretions
  - ▶ NEVER crush EC tablets—defeats the purpose
- ▶ Sublingual tablets
  - ▶ Placed under tongue for direct absorption
  - ▶ Buccal tablets placed between gums and cheek
  - ▶ NEVER swallow SL or Buccal tablets—prevents desired effect
- ▶ Layered tablets
  - ▶ Two meds with different components
- ▶ Film Tab
  - ▶ Tablet sealed with a film. The special coating helps to protect the stomach.
- ▶ Disintegrating and chewable tablets



**Figure 17-3** Sublingual (A) and buccal (B) tablets. (From Potter PA, Perry AG, Stockert P, Hall A: *Fundamentals of nursing*, ed 9, St Louis, 2016, Mosby.)



**Figure 17-4** Layered tablet.

# Forms of Solid Medications (Cont.)

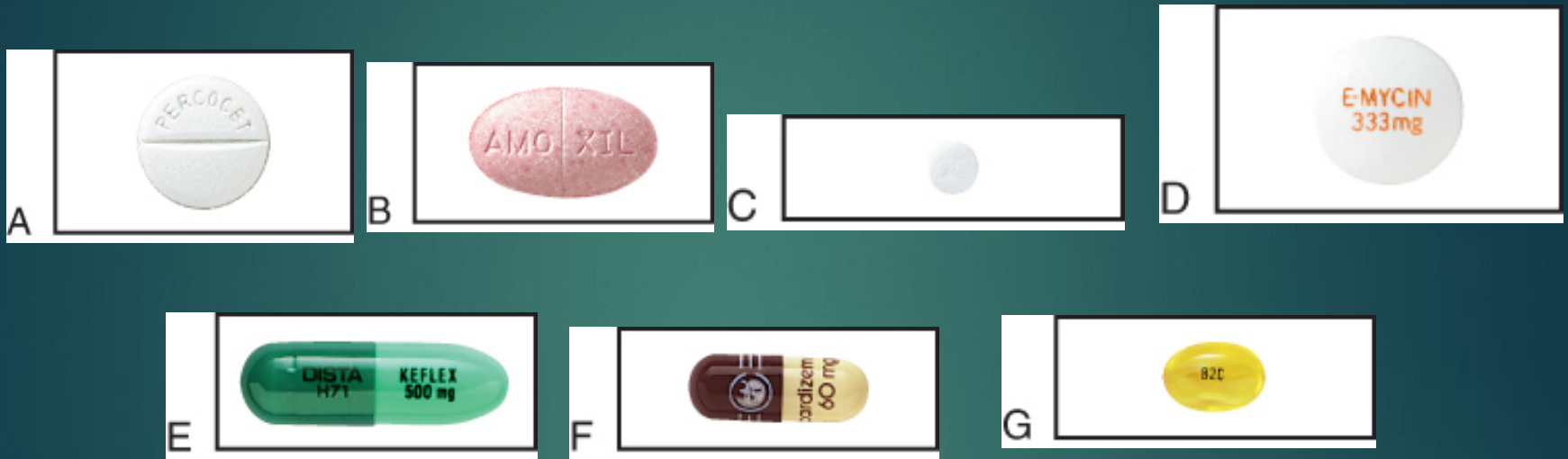
- ▶ Time-release and extended-release tablets
  - ▶ Labeled SA, LA, XL, SR, or ER
  - ▶ Released over a period of time
  - ▶ NEVER crush, chew, or break
- ▶ Capsules
  - ▶ Contains powder, liquid, or oil with hard/soft gelatin coating
  - ▶ NEVER crush, chew, or break without consulting a pharmacist.
- ▶ Others: troches, lozenges, pulvules, spansules, sprinkle capsules

# Troche



# Spansule





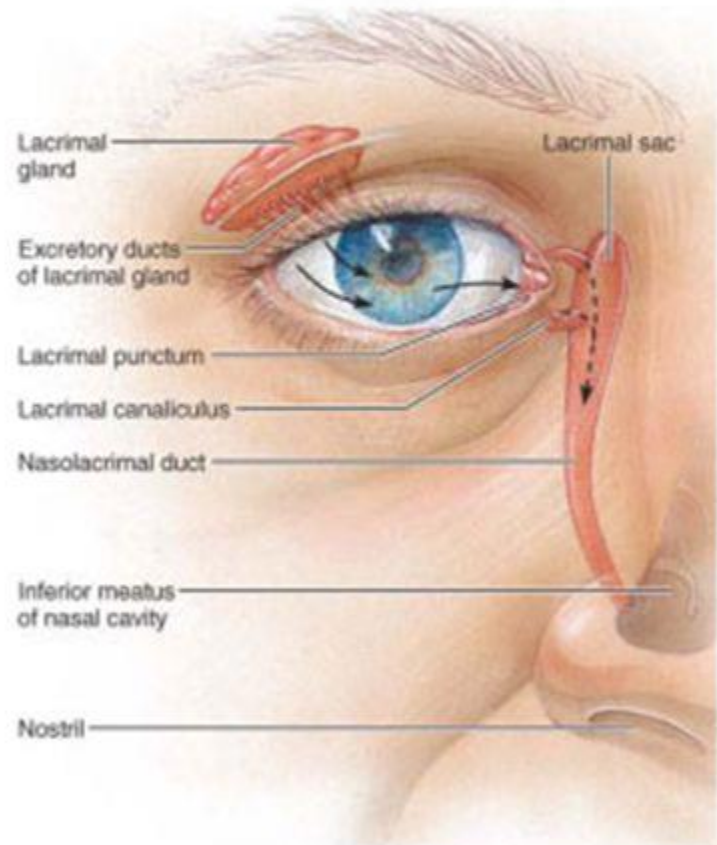
**Figure 17-5** Types of oral medications. A, Scored tablet. B, Chewable tablet. C, Sublingual. D, Timed-release tablet. E, Capsule. F, Timed-release capsule. G, Gelatin capsule.

# Eye drops

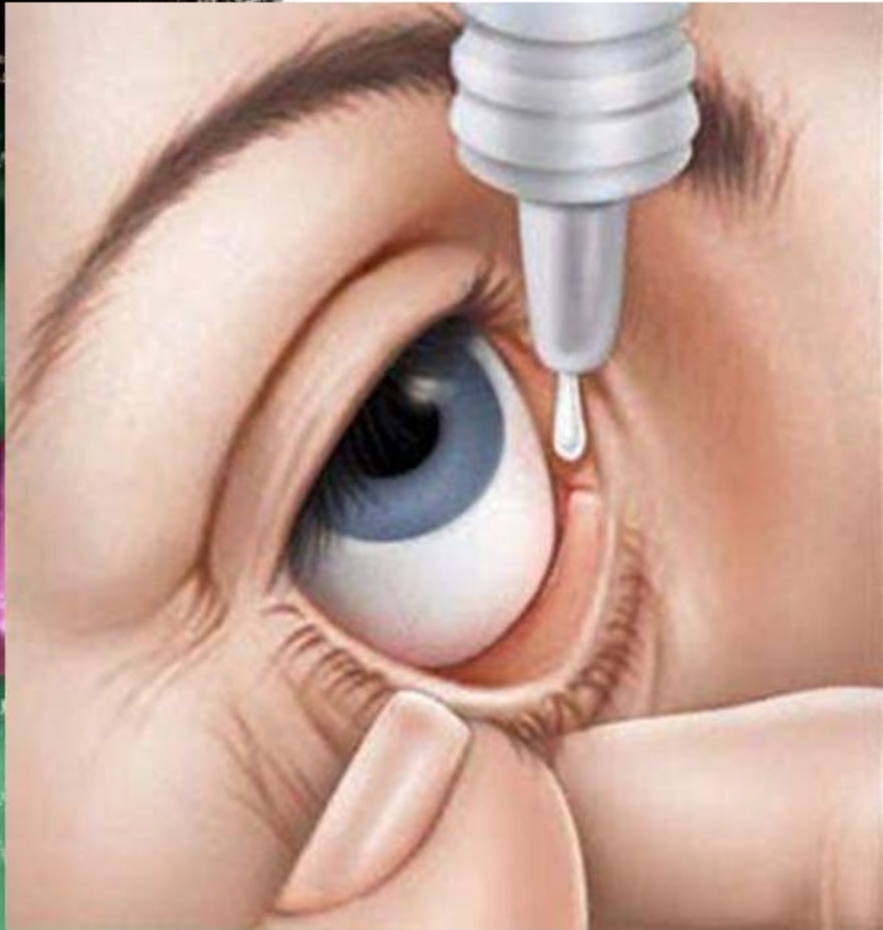
# Medication Administration



- Read the doctors orders
- Check the medication twice
  - Name
  - Dosage
  - Amount
  - Expiration date
- Wait 5 min between gtts



# Assisting with Eye Drops



- Check the order form and pharmacy label.
- Read the instructions carefully.
- Be certain you know which eye is to be treated. Initials may be used to specify the eye that requires treatment. O.D. = right eye; O.S. = left eye; O.U. = both eyes
- Assemble the necessary equipment.

# Instill eye drops

1. Identify pt. Compare name on medication sheet with pt ID band . Ask pt to state name.
2. Check prescribed medication order for number of drops (if a liquid) and eye

Rt. = O.D.

Lt. = O.S.

both = O.U.

# Eye drops

OD – Oculus Dexter (right eye)

OS – Oculus Sinister (left eye)

OU – Oculus Uterque (both eyes)

# Eye drops

## HOW TO CORRECTLY ADMINISTER CLINITAS EYE DROPS



1. Wash your hands. Tilt your head back and look at the ceiling



2. Using your index finger, gently pull down your lower eyelid to form a pocket



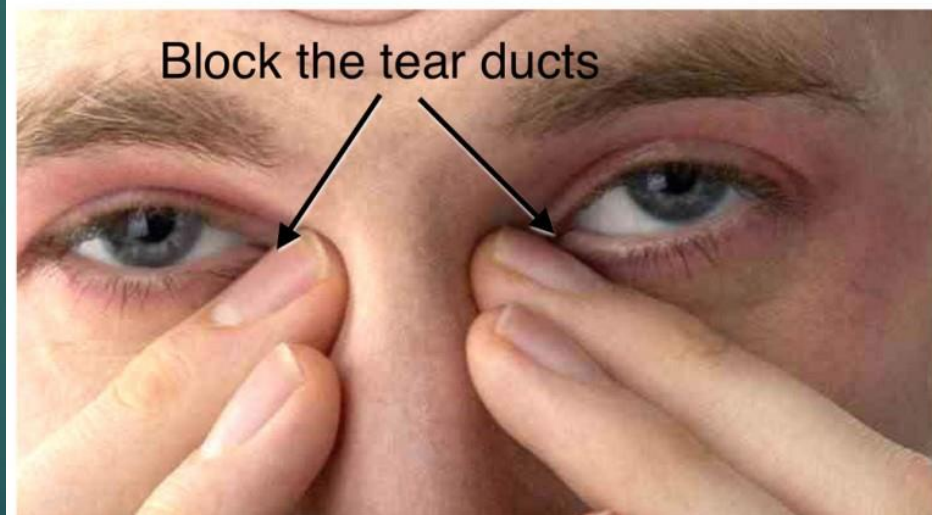
3. Gently squeeze 1 drop into the pocket, don't let the tip touch your eye, your finger or anything else.



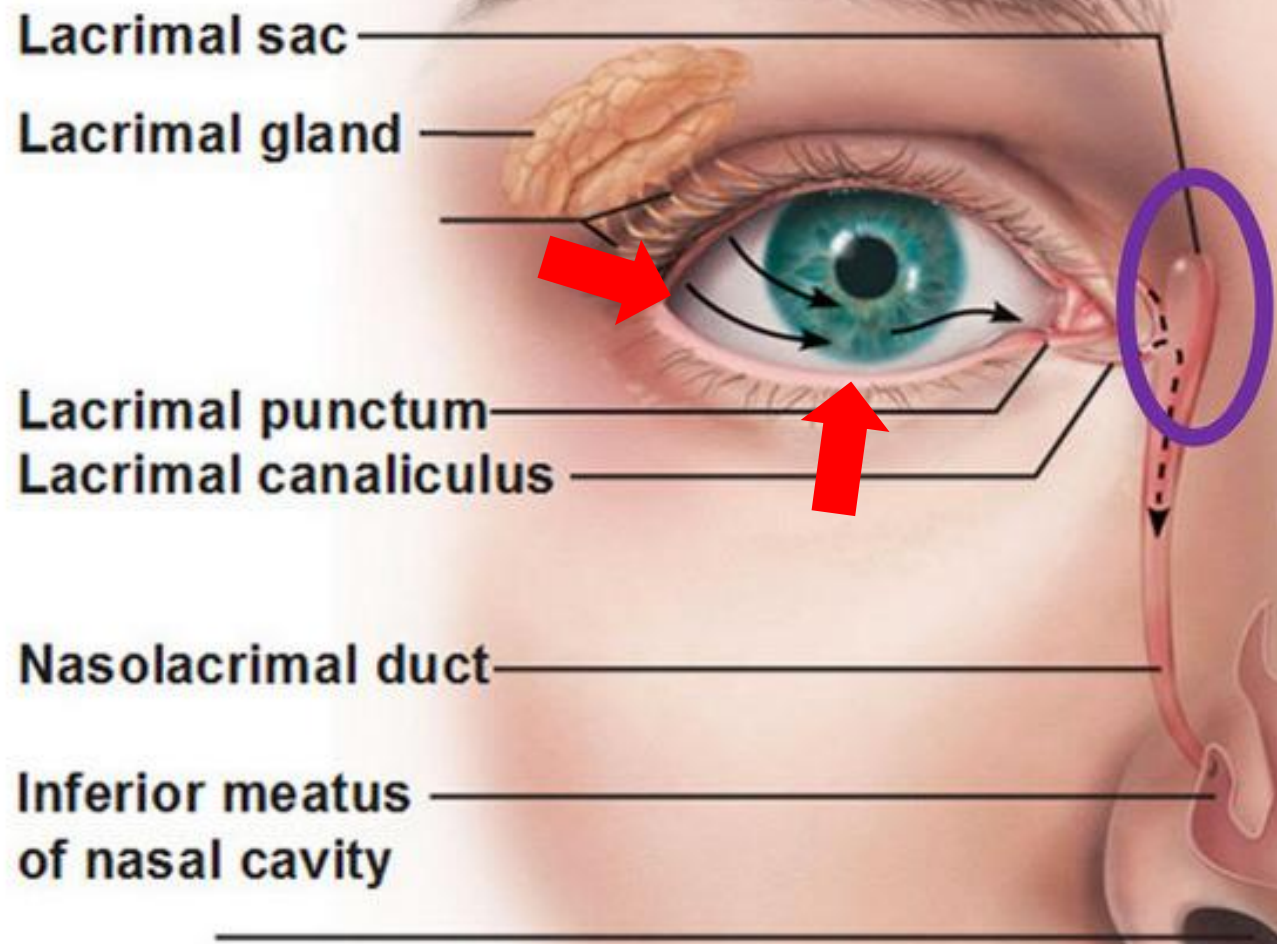
4. Gently close your eyes and lightly press on the inside corners of your eyes.

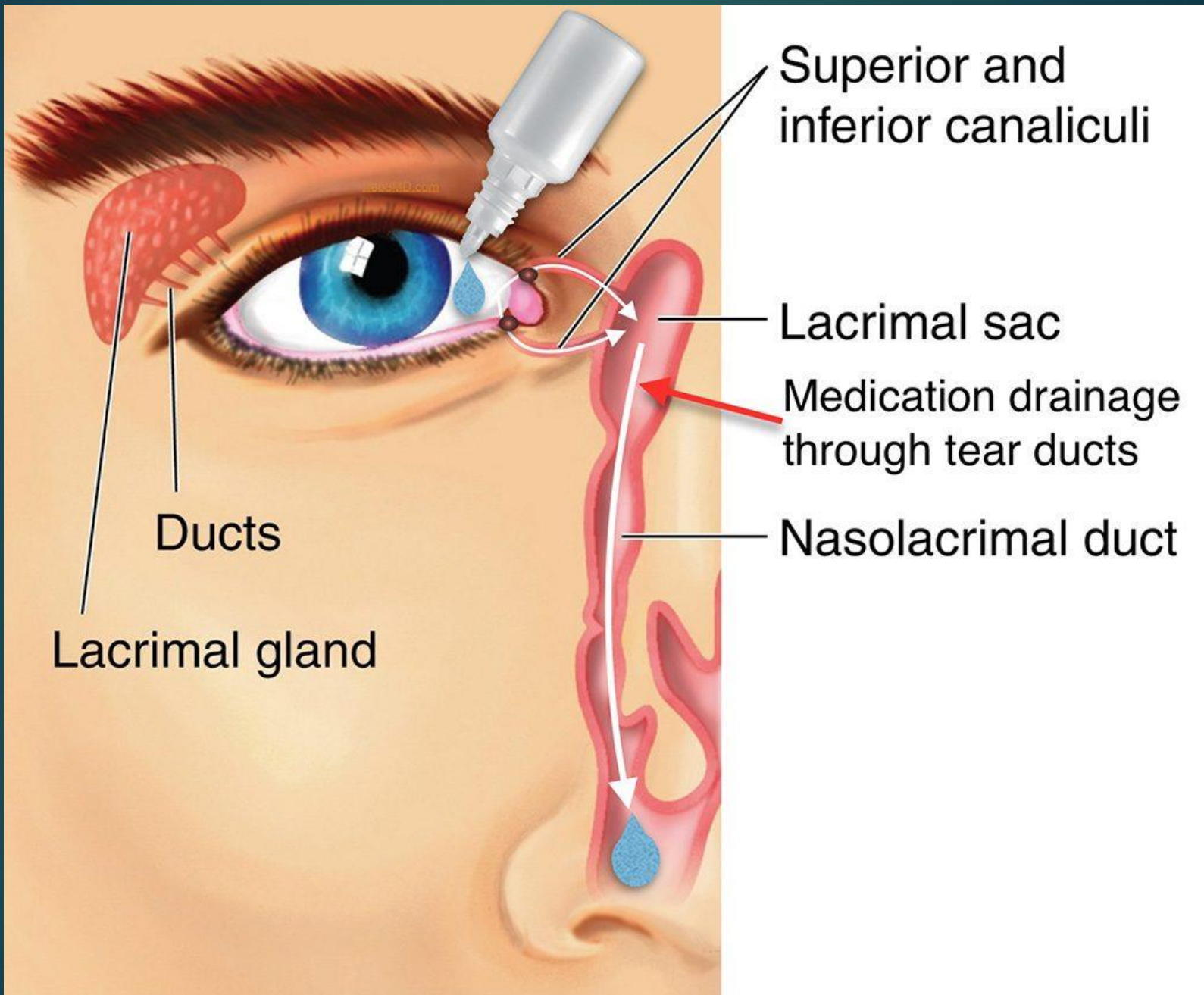


5. Then carefully blot away any excess liquid that may be on your skin.

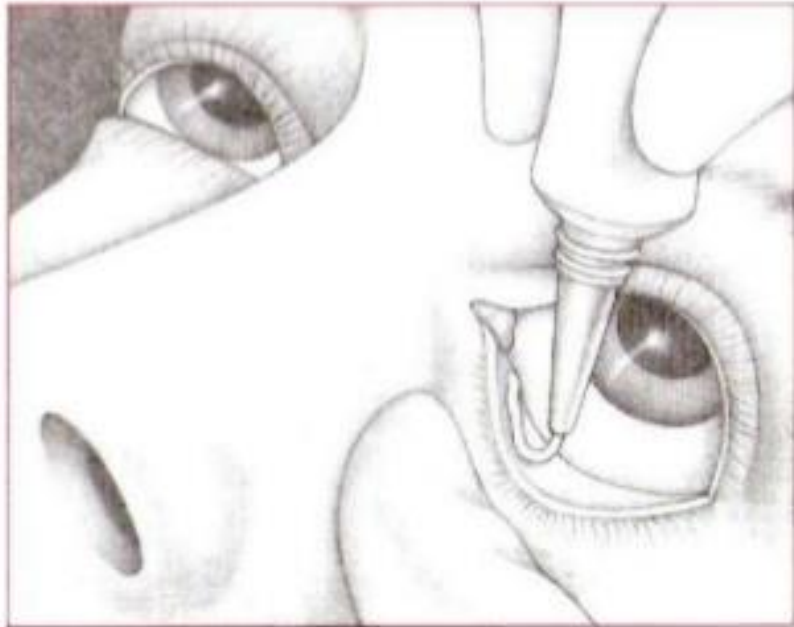


How to instill eye drops





# Instilling Eye Ointment



- Gently lay a thin strip of the medication along the conjunctival sac from the inner canthus to the outer canthus. avoid touching the tip of the tube to the patient's eye. then release the eye lid and have the patient roll his eye behind closed lids to distribute the medication.

# OTIC Medications

## Ear drops

## ***Ear Drops***

- Wash hands
- Explain procedure
- Lie on side/tilt to side
- Warm drops if possible
- Pull the pinna back and up
- Use separate bottles for R+L
- Insert prescribed drops
- Remain in position 2-3mins
- Record
- Wash hands



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# Adult ear drops



# Children's ear drops



# OTIC MEDICATIONS

Typically they are in the form of drops.  
This root is upsetting because child cannot see the procedure..



- Ensure that medication is at room temperature.
- Cold ear drops cause pain & vertigo

## PROCEDURE

- Place child in supine or side lying position with affected ear exposed.
- Pull pinna downward & back in children under 3 years.
- Pull pinna upward and back in children over 3 years.



# Topical Medications

(Always wear gloves!!!)

# Routes of administration

## **Topical administration:**

Medications applied to the skin and mucous membranes generally have local effects.

- Applied to skin.
- Rectal.
- Otic.
- Optic.
- Nasal.

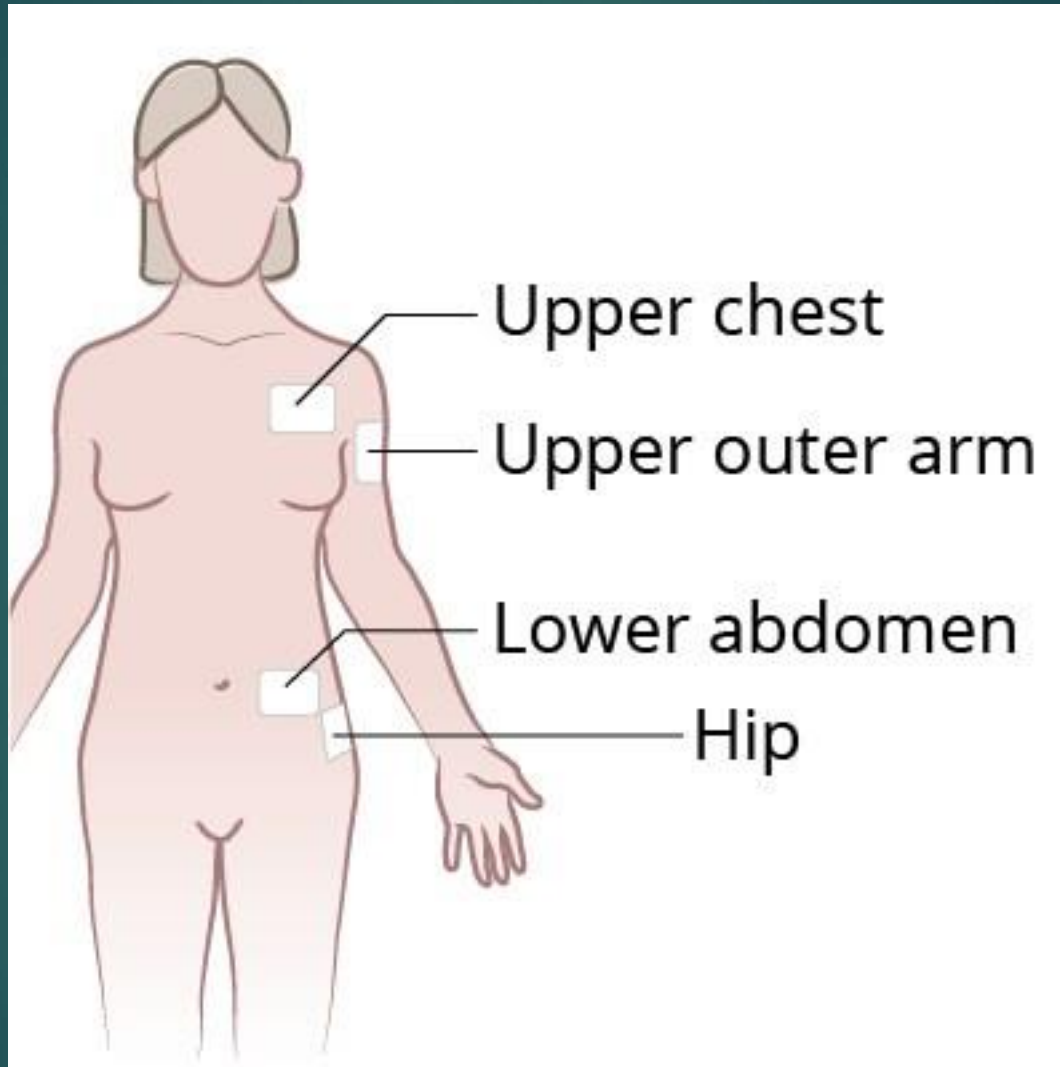


# Estrogen Patch

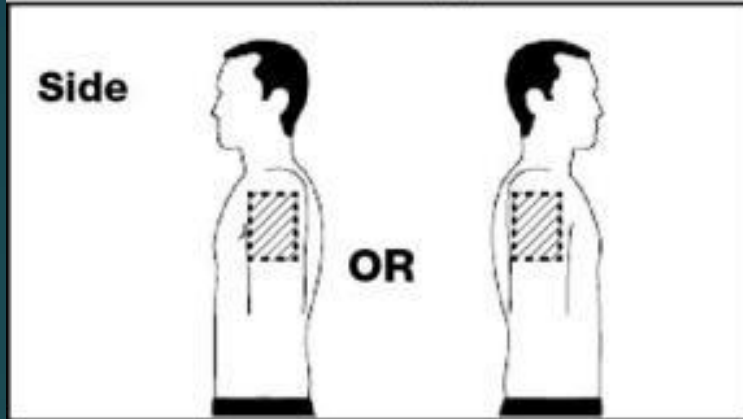


# Estrogen Patch

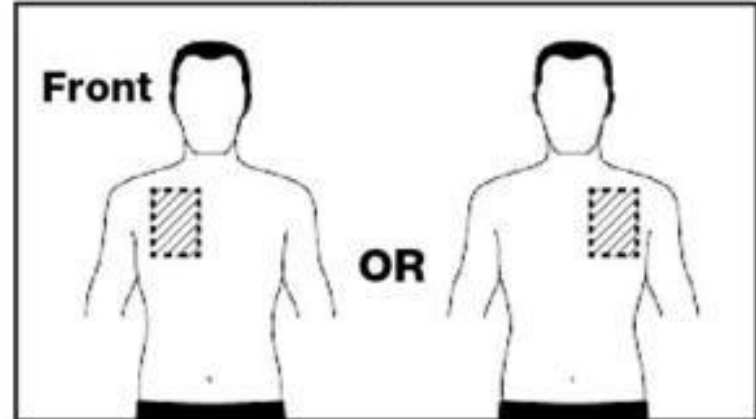




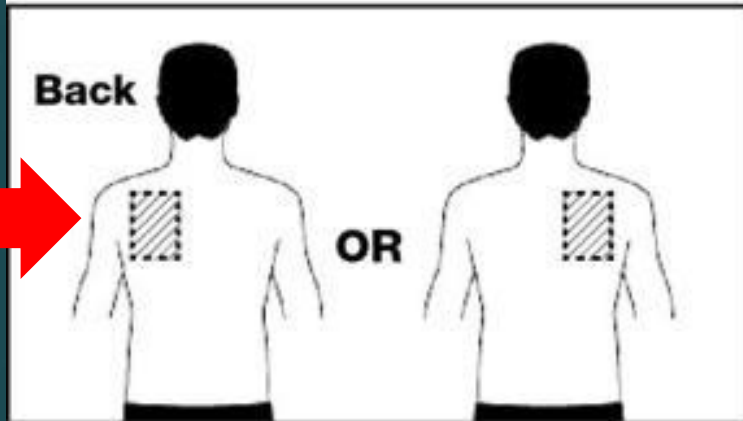
Left or Right Upper Arm



Left or Right Side of Chest

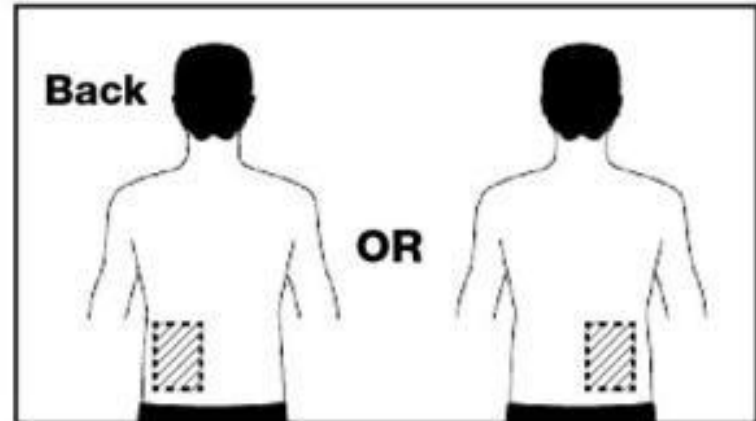


Back



Left or Right Upper Back

Back



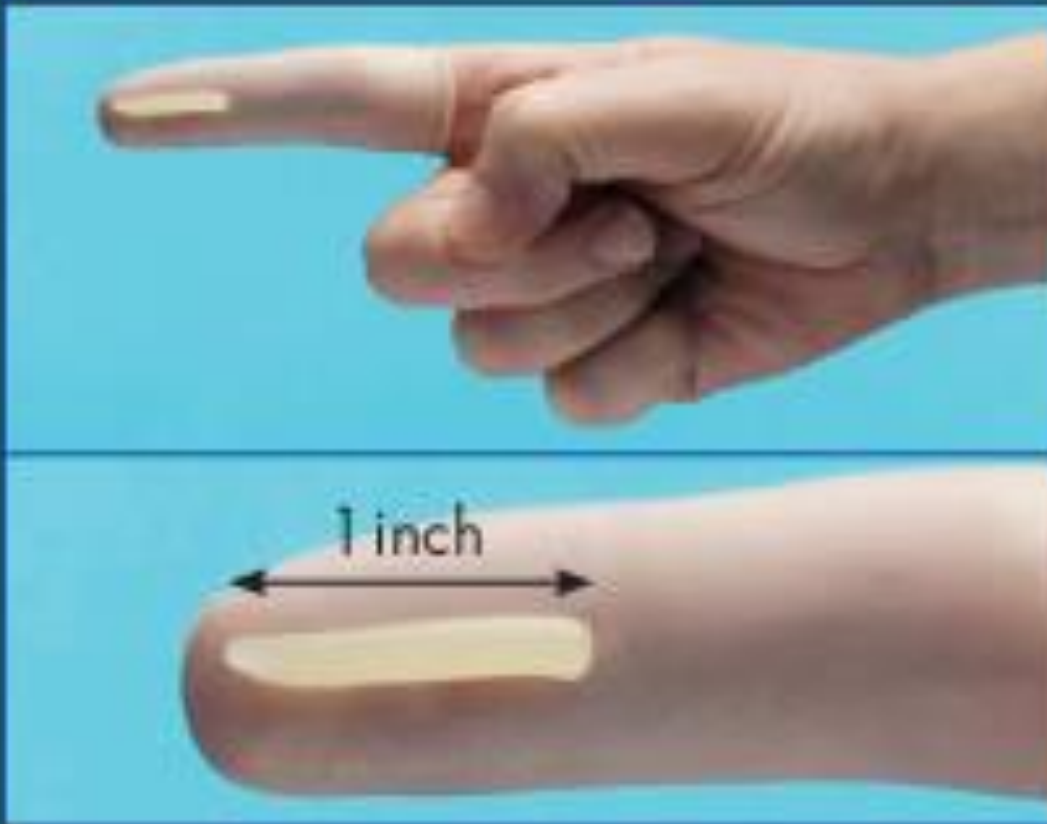
Left or Right Lower Back

**Fentanyl** – powerful synthetic opioid

# Nitroglycerin Ointment

# Nitroglycerin Ointment





**1 inch of  
RECTIV  
provides  
1.5 mg  
of NTG**



# Dry Powder Inhaler



inhaler  
with  
spacer



inhaler



**Using an inhaler**



**Open the  
inhaler.**



**Breathe out.**



**Breathe in  
deeply through  
the inhaler.**



**Hold your  
breath for a  
count of 10.**



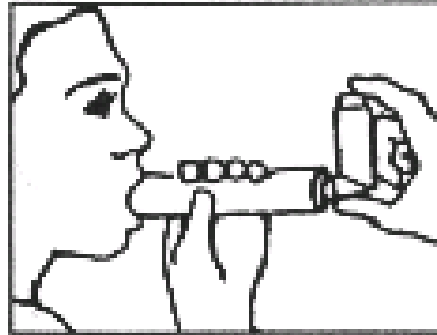
**Breathe out  
slowly.**



**Close the  
inhaler.**



A. Open mouth with inhaler 1 to 2 inches away



B. Use spacer/holding chamber (that is recommended especially for young children and for people using corticosteroids).



C. In the mouth. Do not use for corticosteroids.



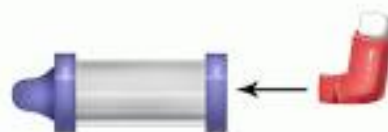
D. NOTE: Inhaled dry powder capsules require a different inhalation technique. To use a dry powder inhaler, it is important to close the mouth tightly around the mouthpiece of the inhaler and to inhale rapidly.

# Metered-Dose Inhaler

## How to Use a Metered-Dose Inhaler with a Valved Holding Chamber (Spacer)



1. Shake the medicine.



2. Insert the mouthpiece of the inhaler into the rubber-sealed end of the spacer.



3. Breathe all of the air out of your lungs. Then put the spacer into your mouth between your teeth. Make a tight seal around the mouthpiece with your lips.



4. Press the metered-dose inhaler down once to release a spray of medicine. The medicine will be trapped in the spacer. Breathe in slowly and deeply.



5. Hold your breath for 5 to 10 seconds and then breathe out slowly. If you cannot hold your breath, another method is to breathe in and out slowly for 3 to 5 breaths.

Inhaler order:

1<sup>st</sup> Bronchodilator (Albuterol)

then

2<sup>nd</sup> Steroid (Flovent)

# Rectal Suppository

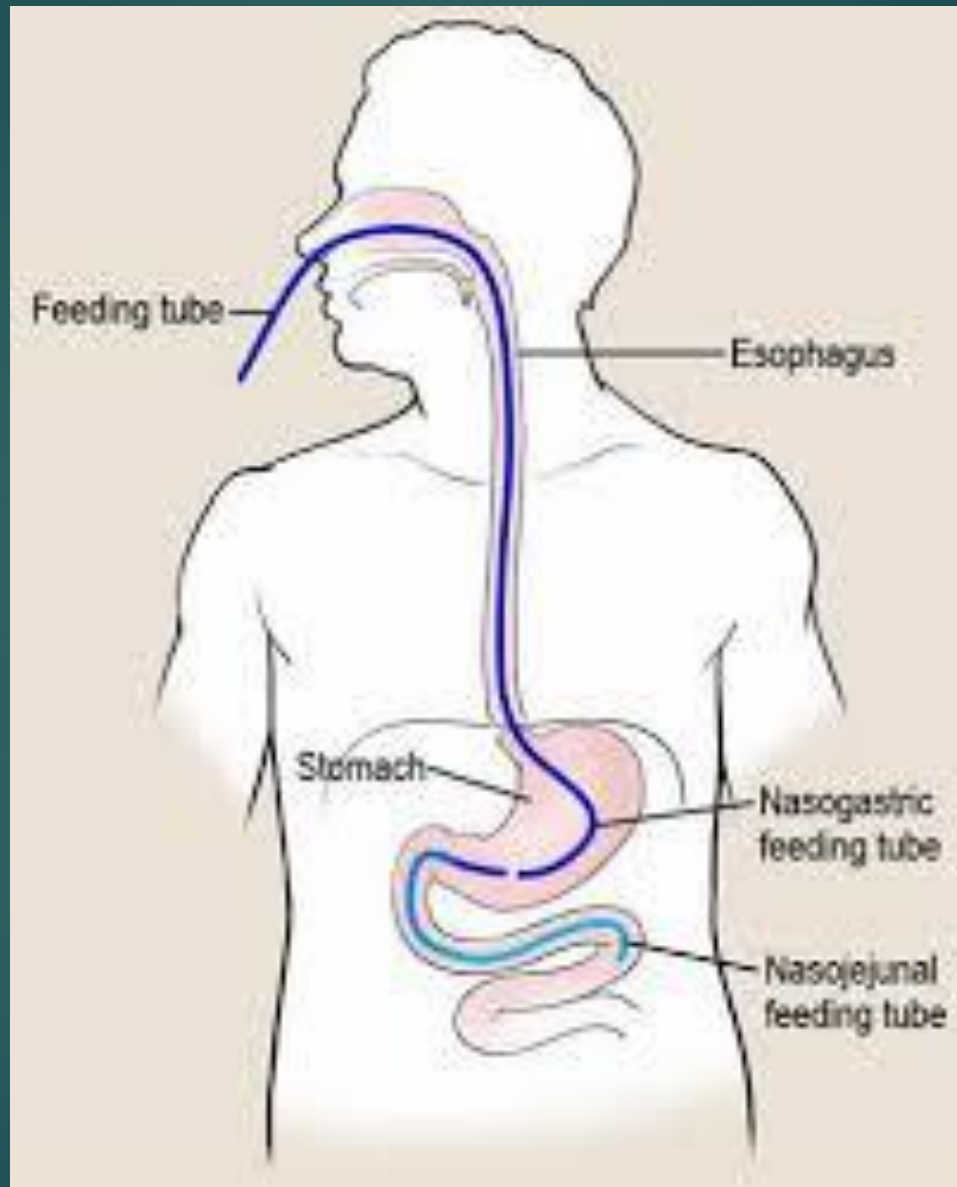
# Rectal Suppositories

Slide  
126

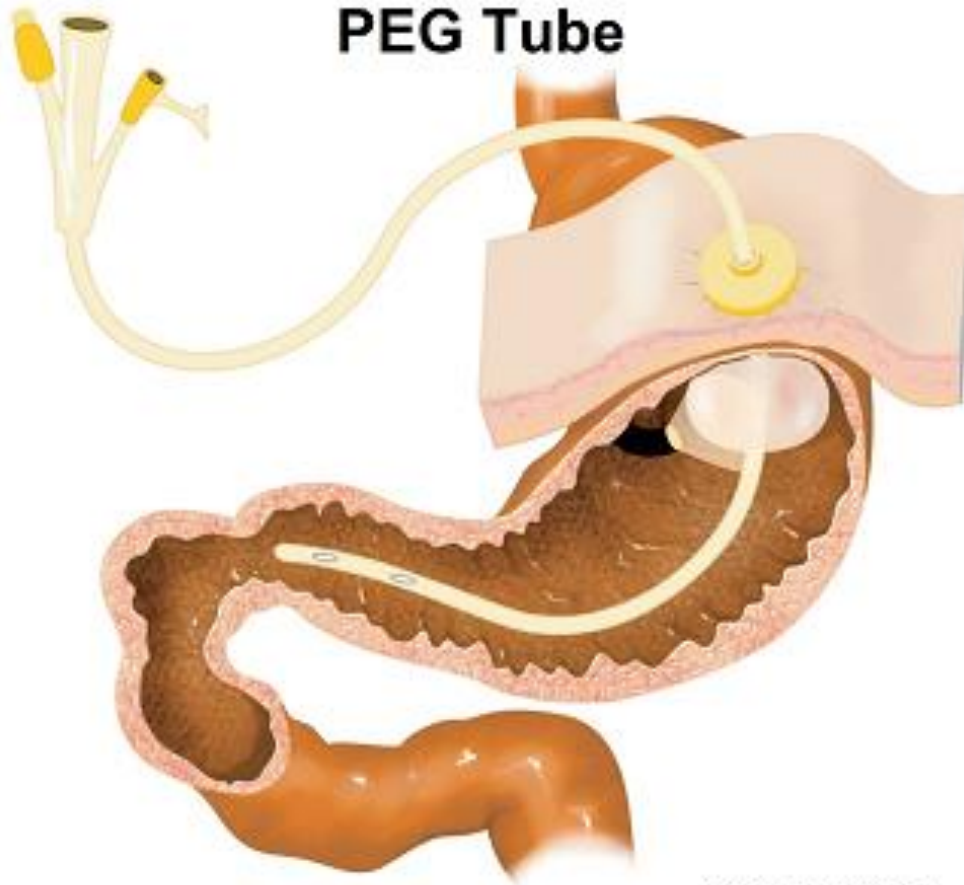
- ▶ Used to promote bowel movements
- ▶ Glycerin and bisacodyl suppositories
- ▶ Promote bowel evacuation
  - ▶ Stimulate the inner surface of the rectum and increasing the urge to defecate
  - ▶ Form gas that expands the rectum
  - ▶ Melt into a lubricating material to coat the stool for easier passage through the anal sphincter



# Nasogastric Tube

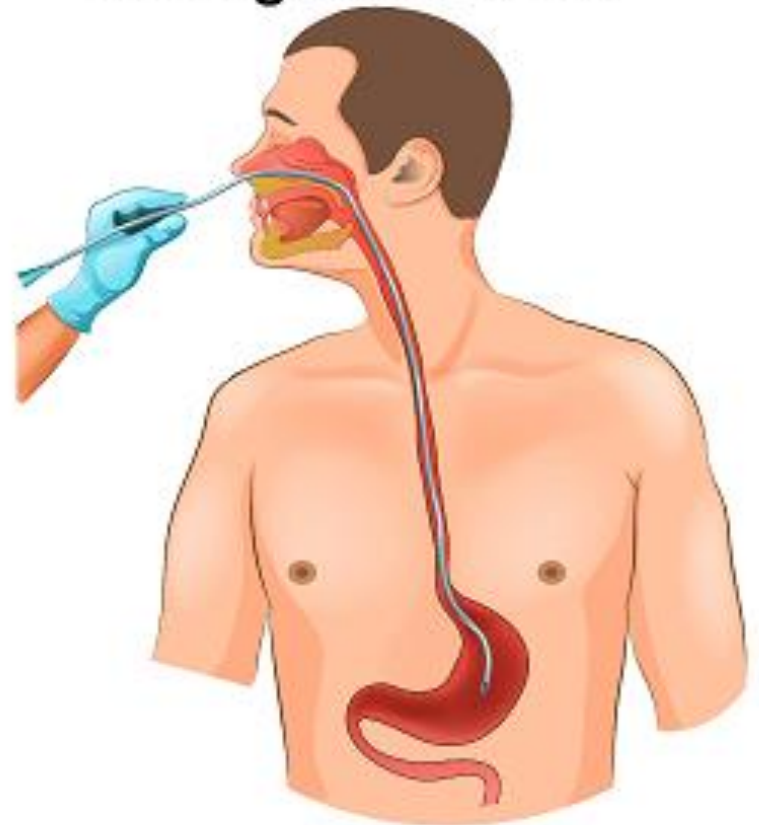


## PEG Tube



Credit: ElenaShutterstock.com

## Nasogastric Tube



Credit: Credit: Artemida-puyti/Shutterstock.com

# Enteral Feeding

# Checking NG Tube Placement

- Try pulling back syringe of gastric fluid
- ~~• Inject air and listen with stethoscope for “whooshing” sound~~
- Tape in place
- Perform x-ray fluoroscopy

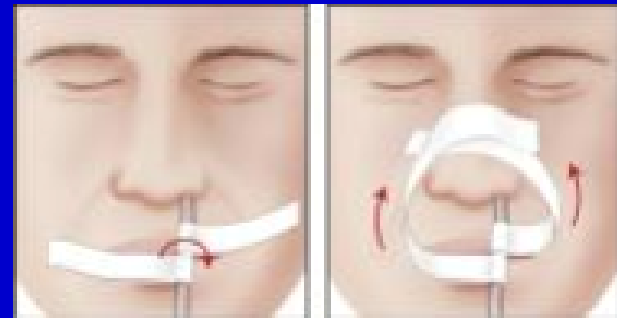


Fig. 18-3 Taping nasogastric tube properly with 1 inch of hypoallergenic tape.

# Confirm NG Tube Placement


- **X-ray**
  - Most reliable if tube is radiopaque
  - Requires order from physician
- **Injecting air**
  - 60 cc catheter syringe
  - Place stethoscope over LUQ of abdomen
  - Inject air into lumen of tube, NOT blue pigtail
  - Listen for “swoosh” sound

# Placement Verification



Figure 30

- ~~○ Nasogastric tube placement can be confirmed by injecting air into the distal end of the tube via a syringe or chest x-ray.~~

 Most facilities require that nasogastric tube placement be confirmed via chest x-ray prior to its use

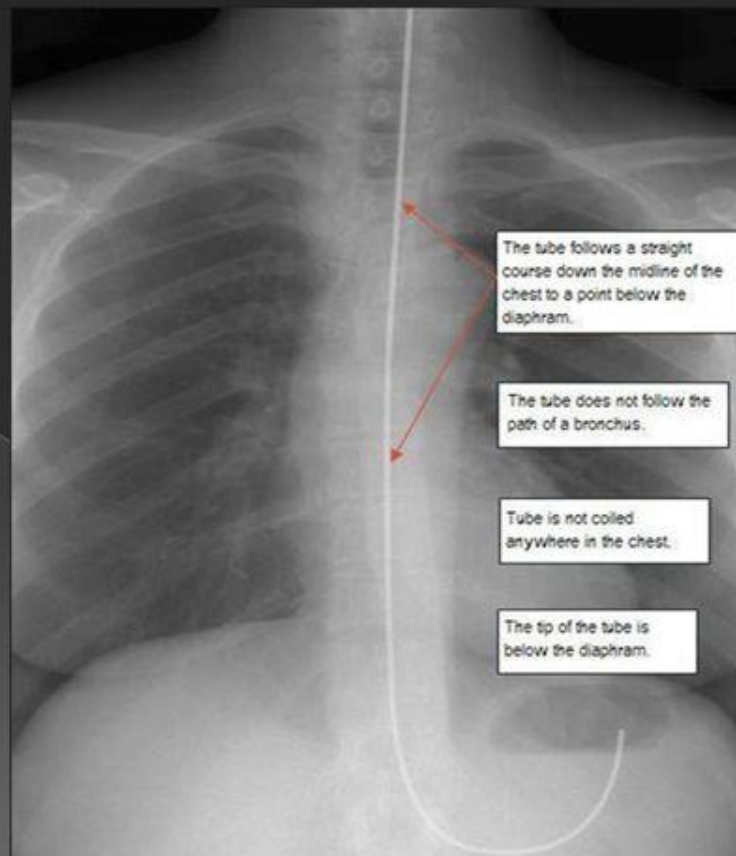


Figure 1. Chest Radiograph Representing Properly Placed Nasogastric Feeding Tube with Tip Visible

Figure 31

# [ Checking pH ]

- Flush the NG tube with 20ml of air – to clear any substance already in tube
- Aspirate 2ml of stomach content and test on pH strip. (blue litmus paper should not be used)
- pH should be  $\leq 5.5$  (acidic)
- If checking pH in tube already in place, wait 1 hour after feed or medication as these can affect pH reading.
- If pH of  $>5.5$  is obtained – & pt is asymptomatic send for X-ray

# REMEMBER

- DO NOT use the 'whoosh' test
- DO NOT use blue litmus paper
- DO NOT use absence of respiratory distress
- DO NOT monitor bubbling at end of tube
- DO NOT use appearance of fluid aspirate





# Kangaroo Pump



# Enteral Feeding Tube

- **Duo Tube** - smaller lumen
  - weighted end
  - goes past stomach into duodenum
  - placement must be verified by x-ray before removing insertion wire.



# Nasogastric Tube Insertion

# PROCEDURE- NASOGASTRIC INSERTION :



- ❑ Wash hand thoroughly
- ❑ Measure distance of tube from tip of patient's ear lobe to nose to tip of xiphoid process.
- ❑ Mark the distance of the tube
- ❑ Lubricate the tube of about 6 to 8 inches with the lubricant using a rag piece or a paper square.
- ❑ Hold the tube coiled in the right hand and introduce the tip into the left nostril.
- ❑ Pass the tube gently but quickly backwards; momentary resistance may occur as the tube is passed into the naso-pharynx.

# Nasogastric Tube Insertion

- Done by physician or nurse
- Consent signed
- Pt in high Fowler's position
- Measure distance from nose to stomach
- Use lots of lubricant
- Pt instructed to swallow (H<sub>2</sub>O or air)
- DO NOT force
- Tube placement verified by fluoroscopy or radiograph

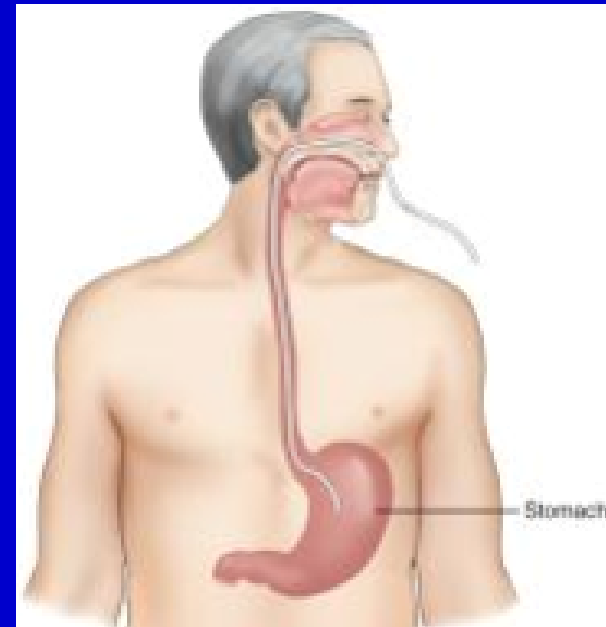


Fig. 18-2 Proper nasogastric tube position.

# Inserting NG Tube

- **Insert tube**
  - Along floor of nose
  - Straight back
  - Advance until resistance felt (nasopharynx)



# PROCEDURE- NASOGASTRIC INSERTION :

- When the tube reaches to pharynx the patient may gag. Allow him to rest for a moment.
- Have the patient take the sips of water on command advance the tube 3-4 inches each time swallows.
- Make sure tube is in stomach.
- Once location of NG tube insured close other end of tube with spigot, secure adhesive in 'T' or butterfly



# Securing the Tube

- **Secure to patient's nose**
  - Tape to nose and coil around tube
  - Avoid pressure to nares
  - Secure to patient's clothing near shoulder area
  - Blue pigtail must be above level of patient's stomach





### **Step 1:**

Place the intact half of the tape strip over the bridge of the patient's nose



### **Step 2:**

Wrap one end of the split portion of the tape strip around the NGT



### **Step 3:**

Wrap the remaining end of the tape strip around the NGT in the opposite direction



### **Step 4:**

Place a tape strip over the bridge of the patient's nose horizontally

## **:Preparation**

- **Check physician's order for removal of NG tube.**
- **Explain procedure to client.**
- **Assist to semi- Fowler's position.**
- **Prepare equipment.**
- **Wash hands.**
- **Wear clean disposable gloves.**
- **Place disposable pad across client's chest.**
- **Give emesis basin and tissues to client.**
- **Attach syringe and flush with 10 ml of water or normal saline solution.**



