

**LOUISIANA
DEPARTMENT OF
HEALTH AND HOSPITALS**

**OFFICE FOR CITIZENS
WITH
DEVELOPMENTAL
DISABILITIES**

**MEDICATION ADMINISTRATION
COURSE**

**INSTRUCTOR'S MANUAL,
SUPPLEMENTS, GUIDELINES
AND FORMS**

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STATE OF LOUISIANA
DEPARTMENT OF HEALTH AND HOSPITALS
OFFICE FOR CITIZENS WITH DEVELOPMENTAL DISABILITIES

MEDICATION ADMINISTRATION COURSE

Instructor's Manual

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MEDICATION ADMINISTRATION COURSE
INSTRUCTOR'S MANUAL

TABLE OF CONTENTS

	INTRODUCTION	1
	A. Medication Attendant Law	3
	B. Responsibilities and Prohibited Functions of the Medication Attendant	6
PART I	LESSON CONTENT	
Lesson 1	Responsibilities in the Area of Medication Administration and Legal Mandates	9
Lesson 2	Fundamentals of Basic Pharmacology	21
Lesson 3	Fundamentals of Medication Therapy	33
Lesson 4	Principles and Fundamentals of Administering Medications	41
Lesson 5	The Medication Cycle	56
	A. Observing for Physical and Behavioral Problems and/or Changes	58
	B. Reporting and Recording Changes	65
	C. Assisting in Visit to Physician and Pharmacist	68
	D. Recording and Storage of Medications	72
Lesson 6	Medication Administration	74
Lesson 7	Documentation	90
Lesson 8	Introduction to the Use of Medication References	93

Lesson 9	Medication Classifications--Overview	95
Lesson 10	Medication Classifications--Specifics	
Section 1	Vitamins and Minerals	107
Section 2	Respiratory System	109
Section 3	General and Local Anti-Infectives	115
Section 4	Cardiovascular System.	123
Section 5	Urinary System	132
Section 6	Nervous System	135
Section 7	Endocrine System	158
Section 8	Gastrointestinal System	165
Section 9	Skin and Mucous Membranes	170
Section 10	Eye and Ear	173
PART II	GLOSSARY	178
PART III	SELF- TEST STUDY GUIDES	195
	SELF- TEST STUDY ANSWERS	230
PART IV	PRACTICAL CHECKLISTS	265

Medication Administration Course

INSTRUCTOR'S MANUAL

INTRODUCTION

PREFACE

The Medication Administration Course has been designed for instruction by combined classroom lecture and self study. As the instructor, and in consideration of your agency's policy, you will be the best judge of how to use your time during the 40 hours of theory. The trainee's background will influence this decision. The Curriculum Guide of Teaching Techniques and Supplemental Guide Manual will assist you in designing your individual curriculum.

ORGANIZATION

The format of this course has been designed to facilitate the learning of essential content and the mastery of entry level skills in administering medication. Each lesson begins with learning objectives and ends with self study questions. A glossary is provided at the end of the course. Your instructor's manual has the same course content as the trainee's manual except for the insertion of "Instructor's Notes". The insertions guide you to additional information, charts, and diagrams that you may choose to use in your lecture. The supplements give you a resource for questions the trainee may have that is not covered in the course content. For example, when lecturing on cardiovascular medications, the supplement will give you a narrative on the anatomy and physiology of the heart, as well as a diagram of the heart with circulation. The supplements may also be used for your quarterly in services required after the trainee has been certified. Use these supplements anyway that will benefit you. Many of the diagrams can be converted to transparencies and used as overheads during this course or during an in service.

The Instructor's Manual has the following sections which are not included in the Trainee Manual: Self Test Answers, and Practical Checklists. There are 25 Practical Checklists specific to administering different types of medication, vital signs and hand washing. Directions for administering the practical portion of this course are located at the beginning of the Practical Checklists section of the Instructor's Manual.

REMEMBER

It is up to you to take this course and the resources we have made available to you and enhance the course content through your teaching method. The trainee may not have a medical background and it will be up to you to present this material in a manner the trainee can relate to. The successful completion of the course by the trainee will largely depend on how interesting you can make the course. Support the trainee by showing your interest and enthusiasm in his/her work through out the course and both you and the trainee will be rewarded by knowing that the individuals we work with are receiving their medications in a safe and proper manner.

A. MEDICATION ATTENDANT LAW

Act 877, 1991, as amended by Acts 668 and 725, 1995

AN ACT

To amend and reenact R.S. 37:1021, 1023, 1024, and 1025, relative to medication attendants; to provide for applicability; to provide for the establishment of drug administration courses by the secretary of the Department of Health and Hospitals; to provide for the functions of medication attendants; to provide for qualifications for the drug administration course; and to provide for related matters.

Be it enacted by the Legislature of Louisiana: Section 1. R.S. 37:1021, 1023, 1024, and 1025 are hereby amended and reenacted to read as follows:

1021. Applicability

This Part shall apply to the Office for Citizens with Developmental Disabilities of the Department of Health and Hospitals and to community homes for persons with mental retardation funded through the Department of Health and Hospitals and intermediate care facilities for the mentally retarded, and to in-home Medicaid waiver services provided to persons with developmental disabilities. This Part shall apply to programs/agencies contracting for services with the Department of Health and Hospitals and/or the Department of Social Services except as specifically prohibited in R.S. 37:1024(B)(4). Participation on the part of private providers that contract with the Department of Health and Hospitals or the Department of Social Services is strictly voluntary.

1023. Drug administration course; fees

A. Drug administration courses shall be established by the office of the secretary of the Department of Health and Hospitals in conjunction with the Louisiana State Board of Nursing and the Louisiana State Board of Practical Nurse Examiners and as approved by the secretary of the Department of Health and Hospitals. Persons who have successfully completed the course and passed a qualifying examination shall be permitted to administer certain medications to residents of facilities operated by the Office for Citizens with Developmental Disabilities or community homes for persons with mental retardation funded through the Department of Health and Hospitals or the Department of Social Services and to persons with developmental disabilities receiving in-home Medicaid waiver services and shall be known as medication attendants. The course shall include but not be limited to instruction of legal aspects, roles, and responsibilities of drug administration, definitions, terminology, classification, measurement, identification, effects, distribution, and the care and handling of drugs.

B. Fees for the drug administration course shall be determined by the office of the secretary of the Department of Health and Hospitals. The cost of implementation will be reimbursed to providers with contract by the Department of Health and Hospitals or the Department of Social Services.

C. The Department of Health and Hospitals shall promulgate rules in accordance with the Administrative Procedure Act to provide for the certification of medication attendants, the renewal, suspension, or revocation of such certification and an appeals process for persons who have been denied certification or renewal, or whose certification has been suspended or revoked. The department shall also promulgate rules for the assessment of fees for instructor training courses.

1024. Authorized and prohibited functions of medication attendants.

A. The authorized functions of the medication attendant are:

1. Deliver and administer medications ordered by a physician or dentist to residents with the supervision of a registered nurse.
2. Record in the client's chart doses delivered to and/or administered to the client.
3. Chart drug effects and side effects; obtain vital signs as indicated or ordered.
4. Deliver pro re nata "PRN", as needed, medications when authorized by a licensed physician, dentist, or registered nurse. This authorization must be documented in writing within twenty-four hours.

B. The prohibited functions of the medication attendant are:

1. May not give medications by intramuscular, intravenous, or subcutaneous routes.
2. May not administer medications by the oral inhalant aerosol route unless administering a pre measured dosage unit provided by the manufacturer.
3. May not receive or assume responsibility for reducing to writing oral or telephone orders from a physician.
4. May not alter medication dosages as delivered from the pharmacy, unless authorized by a physician or dentist.
5. May not administer medication in an acute care unit funded or operated by the Department of Health and Hospitals and/or the Department of Social Services.

1025. Qualifications of applicants to the drug administration course.

Each person accepted to participate in the drug administration course shall be a citizen of the United States and a resident of this state and in addition:

1. Must be employed in a facility operated by the office for citizens with developmental disabilities in a community home for persons with mental retardation funded through the Department of Health and Hospitals or the Department of Social Services or in intermediate care facilities for the mentally retarded, or be a person who provides in-home Medicaid waiver services to a person with a developmental disability.
2. Must be at least eighteen years of age.
3. Must be able to read, write, and comprehend the English language.
4. Must be free of communicable diseases and in suitable physical and emotional health to administer medications safely.
5. Must have no known record or history of drug abuse or record of conviction of a felony. Must be in compliance with the Americans with Disabilities Act (ADA).
6. There will be no discrimination in selection of medication attendants for reason of race, color, creed, religion, or national origin.

The above law was enacted from the Regular Session, 1991, House Bill No. 1258 by Representative Jetson and amended by Regular Session, 1995, House Bill No. 568 by Representative Brun and House Bill No. 2164 by Representative Thomas, Ackal, Alario, Copelin, and DeWitt and Senators Bagneris, Brinkhaus, and Kelly.

B. RESPONSIBILITIES AND PROHIBITED FUNCTIONS OF THE MEDICATION ATTENDANT

RESPONSIBILITIES:

The significance of your role as a staff person designated to administer medications to the clients in your agency's program should never be underestimated. It is important that you, as a direct care worker, understand all the legal issues, roles and responsibilities to which you have been assigned.

Many of the clients in your agency's program will need prescribed medications and drugs which you may not be familiar with and which are potentially dangerous.

When a service agency such as the one you work in, assumes responsibility for the care and protection of its clients, it is required by law to make special efforts to protect their safety. Serious medication errors are often made even in relatively uncomplicated family settings. Given the complexity of a typical service setting (many different staff and clients, staff turnover, etc.) , you can see that a ***systematic set of rules, regulations and laws is necessary to ensure that appropriate procedures are carried out on a consistent basis, and that your specific authorized and prohibited functions and responsibilities as outlined in this manual, the laws and other regulations will serve to protect you and your agency from errors which would have serious legal consequences.***

As you recall from your previous review of Act 877:

The Authorized functions of the medication attendant are:

1. The delivery of medications ordered by a physician or dentist to residents with the supervision of a registered nurse.
2. Record in the client's chart dosed delivered to and/or administered to the client.
3. Chart drug effects and side effects; obtain vital signs as indicated or ordered.
4. Deliver pro re nata "PRN", as needed, medications when authorized by a licensed physician, dentist, or registered nurse. This documentation must be documented in writing within twenty-four hours.

The Prohibited functions of the medication attendant are:

1. May not give medications by intramuscular(IM), intravenous(IV), or subcutaneous routes.
2. May not administer medications by the oral inhalant aerosol route unless administering a pre measured dosage unit provided by the manufacturer.
3. May not receive or assume responsibility for writing oral or telephone orders from a physician.
4. May not alter medication dosages as delivered from the pharmacy, unless authorized by a physician or dentist.

5. May not administer medication in an acute care unit funded or operated by the Department of Health and Hospitals and/or the Department of Social Services.

In addition to the authorized and prohibited functions as outlined in Act 877, and bearing in mind the necessity of assisting individuals who have developmental disabilities develop their abilities in various fields of activity, the following concepts are to be observed:

1. A client, if capable, is to be encouraged to self administer medication.
2. A client and/or the parents of a client under 18 years of age have a right to know what medication he is receiving, its actions and adverse reactions.
3. Only medications which a physician or dentist has prescribed or approved for the client should be given.
4. Medications should not be given for the convenience of the staff, but only for the benefit of the client.
5. Medications which do not show specific effects should be brought to the attention of the prescribing physician.
6. A positive approach should be taken when giving medications. If the use of physical force is necessary to administer medication, this situation must be brought to the physician and supervisor's attention.
7. All medication changes should be discussed with the clients and/or parents of a client under 18.

PARTICIPANTS SHOULD REVIEW THEIR OWN AGENCY'S POLICIES AND PROCEDURES FOR ANY ADDITIONAL RESPONSIBILITIES.

Answer Self Test Questions - Introduction

Medication Administration Course
TRAINEE MANUAL

PART 1

LESSON CONTENT

Lesson 1:
RESPONSIBILITIES IN THE AREAS OF MEDICATION ADMINISTRATION
and LEGAL MANDATES

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Discuss who is responsible for administration of medication
2. Discuss medication standards
3. Describe the purpose of medication legislation
4. Discuss legal obligations as it relates to neglect and malpractice
5. Discuss regulations pertinent to medication labeling

Who Is Responsible?

Doctors, pharmacists, nurses and other specified residential staff are all members of a team that is responsible for giving individuals the correct medications. All staff must be aware of their legal responsibilities regarding the administration of medication. You must therefore understand how to properly give (administer) medications and record their actions (effects).

In addition to understanding the correct method of administration and documentation, the staff must be aware of policies and procedures regarding omitted and refused medications. The material in this lesson will be supplemented with your agency's specific policies and procedures.

I. People Responsible for Medication

- A. **Physicians**--determine need for and orders medication.
- B. **Pharmacists**--fills the order and provides information about medications to the residential staff, individuals, monthly medication administration, storage, use and appropriateness of therapy by performing quarterly drug reviews.
- C. **Registered nurses, licensed practical nurses**--administer medications ordered by the physician, transfer, telephone orders to writing and monitors the accuracy of medication administration to clients.

D. Certified Medication Attendants--Administer only those medications for which they are so authorized to administer by law.

1. Responsibilities before administering medication:
 - a. Check the original medication order and MAR for accuracy.
 - b. Prepare the medication for administration.
 - c. Use the proper equipment.
 - d. Prepare the medications accurately by using the "Rule of Three" (discussed in Lesson 4).

2. Responsibilities during the administration of medications:
 - a. Identify the individual (use Photo Identification).
 - b. Explain the procedure to the individual.
 - c. Administer the medication correctly. (Pour only one medication at a time.)

3. Responsibilities following administration of medications:
 - a. Record the administration of the medication on the MAR.
 - b. Clean the equipment.
 - c. Observe and record the effects of the medication.
 - d. Record and report the adverse effects or poor response to the medication.

LEGAL MANDATES

I. Medication Standards and Legislation

Standardization is needed to ensure uniformity of the purity and potency of medication. Their primary purpose is to provide standards for identity, strength, and purity of substances used in the practice of health care.

Medication legislation is designed to protect the public from fraud, false advertising and untested drugs and to regulate the manufacture and dispensing of drugs.

The Federal Food, Drug, and Cosmetic Act, June 25, 1938, spells out regulations concerning the purity, strength, effectiveness, safety, labeling, and packaging of medications.

The amendment of 1952 allows certain medications to be dispensed only by prescription and to be refilled only on a doctor's order; it also recognizes over the counter medications (OTC) as medications that do not require a prescription.

The labeling aspect is an important part of this act. Warning statements must appear on the label of certain medications. For example, laxatives must bear a statement that "such medications should not be taken in the presence of abdominal pain or cramps and that they may be habit forming". Requirements like these go a long way in protection of the public.

II. Legal Obligations of Medical Personnel

- A. State and Federal regulation set forth the **rights of individuals**.
- B. Agencies and all personnel are required to respect **individuals' rights** which include: (Not to be confused with the 6 Rights of Medication Administration.)
 - 1. The right to refuse medication and treatment.
 - 2. The right to be informed on consequences of refusing medication and treatment.
 - 3. Freedom from physical and mental abuse and neglect.
 - 4. Freedom from restraint without a physician's written order.
 - 5. The right to privacy.
 - 6. The right to confidential treatment.
- C. All individuals are legally protected from:
 - 1. Libel and slander.
 - 2. Assault and battery.

III. Malpractice and Negligence

- A. Malpractice is an act of negligence as applied to a **PROFESSIONAL** person, such as a physician, nurse and dentist.
 - 1. Malpractice is any improper or injurious practice or any unskillful or faulty medical treatment.
- B. Negligence is performing an act that a reasonably prudent person under similar circumstances would not do, or failing to perform an act that a reasonably prudent person under similar circumstances would do.
 - 1. By law, individuals can expect safe and efficient care.
 - 2. Individuals expect medication personnel to administer medication accurately.
 - 3. The residential staff is obligated to perform care that meets minimum standards.

- C. Individuals are protected from health care negligence/malpractice by a law called "Duty of Care."
1. The residential staff is negligent if REASONABLE care is NOT given or if UNREASONABLE care IS given.
- D. Both residential staff and individuals are protected by the standard of "Reasonable Care."
1. Individuals can expect "reasonable care." Reasonable care is doing only that which you have been trained to do; acting as others would act in the same or similar situations.
 2. Residential staff are required to provide care based on this minimum standard of "reasonable care."
- E. To avoid being negligent:
1. Do only those things you have been trained to do.
 2. Observe the legal rights of every individual.
 3. Complete all records carefully.
 4. Be informed about the medications including their actions and adverse effects.
 5. Follow the policies of your agency.
- F. Examples of negligence include:
1. Leaving a dependent individual unattended in a shower or bath.
 2. Giving the wrong medication to an individual.
 3. Failing to report an observation or adverse effect to the staff nurse that later has profound consequences for the individual's health.
 4. Causing an injury by using defective/broken equipment or supplies.
 5. Failing to give a medication at the prescribed time (Unless otherwise instructed by physician or RN due to extenuating circumstances.)
- G. Accountability for negligence:
1. All persons are accountable for their own actions.
 2. Supervisory personnel are accountable for the actions of whomever they direct and supervise.
 3. The agency is legally obligated to ensure all individuals are free from physical and mental abuse and restraints.

H. Legal action:

1. May result from claims of negligence and/or malpractice.
2. Action can be brought against the agency, supervisory personnel, and/or an individual who is considered negligent.
3. If the residential staff had "no intent to harm," then a financial settlement may be made.
4. If the individual proves an "intent to harm" or the individual's injury is severe, the residential staff person may be fired.
5. Criminal action may also be taken if a crime is committed, such as:
 - a. **Assault:** a threat or attempt to make bodily contact with another person without that persons consent.
 - b. **Battery:** an assault that is carried out.
 - c. **Neglect:** omission of any reasonable precaution, care or action.
 - d. **Misuse of controlled substances:** The use of a controlled substance for any other purpose then the prescribed purpose.

IV. Ethical Considerations

- A. A "Code of Ethics" is a voluntary set of rules that influence relationships between people based on dignity and respect for each individual's rights.
- B. Words that describe ethical behavior:
 1. Honesty
 2. Sincerity
 3. Loyalty
 4. Dependability
- C. Unethical behavior results in:
 1. Discipline of the worker or group
 2. Feelings of guilt
- D. "Golden Rule" for ethical behavior: "Do unto others as you would have them do unto you, or one of yours."

V. Purpose of the Individual's Record (Chart)

- A. Provides a medical picture of the individual
- B. Provides a legal record that is admissible evidence in a legal action

VI. Legal and Ethical Considerations Concerning Charting

- A. Charts contain confidential information that is available only to people authorized by the agency.
- B. Entries should present an accurate, readable picture of the individual's care.
- C. Legally, the chart is considered accurate. Every medication given must be charted. Residential staff are held responsible for any medications signed out but not charted. Refer to the six rights of administering medications that are listed in Lesson 6.
- D. Your signature on an entry means that you assume responsibility for the entry. You administered or supervised the administration of the medication, made the observation, knew that the care was given as charted.
- E. State law or regulation determines the length of time records must be kept.
- F. PRN medications must be documented. Every entry must be signed and dated. **Results** of PRN medication must also be documented.

VII. Medication Errors

- A. Violation of "reasonable care," often results from not following the "six rights" of medication administration.
 - 1. The "**six rights**" of medication administration are:
 - 1) Give the Right Medication
 - 2) Give the Right Dose
 - 3) Give the medication to the Right Individual
 - 4) Give medication by the Right Route
 - 5) Give medication at the Right Time
 - 6) Provide the Right Documentation
- B. Errors in medication administration can be caused by:
 - 1. Lack of concentration
 - 2. Lack of knowledge
 - 3. Failure to follow correct procedure
 - 4. Poor communication
 - 5. Performing a job beyond your scope of duty

C. Responsibilities regarding medication errors:

1. Truthfully reporting an error is better legally than trying to cover it up.
 - a. Individual can be protected from harmful effects by immediate action.
 - b. Situation can be reviewed and similar errors avoided in the future.

2. **REPORTING**--the FIRST thing to do if you make or discover a medication error is **REPORT IT TO YOUR STAFF NURSE**.
 - a. The staff nurse will notify the physician and receive orders.
 - b. The staff nurse will probably tell you to observe the individual and complete an incident report.

3. **OBSERVING THE INDIVIDUAL FOR UNDESIRABLE EFFECTS:**
 - a. Check the drug information source book for desired action, adverse effects, and toxic effects of the medication that was administered.
 - b. Watch for general symptoms, such as nausea, vomiting, difficult breathing, dizziness, itching, hives, drowsiness, and others listed in the drug information source book under the administered drug.
 - c. Record and report all information that is pertinent to the individual's care.

4. **DOCUMENTING**
 - a. Medication Error Report
 - i. Completed by whomever is the most familiar with the situation, usually the person who committed or discovered the error.
 - ii. Report is sent to the staff nurse or the agency director, and is not put on the chart. It will be signed by the individual's physician. Follow your agency's policy.
 - iii. Medication Error Reports are reviewed periodically by the agency director and the staff nurse, who designs plans that will avoid future errors.
 - iv. Answer all of the questions on the incident report form.

 - b. **Informing the individual of the error:**
 - i. A physician will decide if the individual is to be informed.
 - ii. A physician informs the individual.
 - iii. This decision is not the responsibility of the person administering the medication.

The following list of medications are commonly used look-alike and sound-alike drugs. Being familiar with these will assist you in preventing errors.

Note: We will discuss specific drugs later in the course.

COMMONLY USED LOOK-ALIKE AND SOUND-ALIKE DRUGS

A

Achromycin-----Aureomycin
 Actifed-----Actidil
 ADC-----AVC
 Afrin-----Aspirin
 Aldactone-----Aldactazide
 Aldoril-----Aldomet
 Ambenyl-----Aventyl
 Ambenyl-----Amvical
 Aminopyrine-----Aminopterin
 Ananase-----Orinase
 Ananase-----Tolinase
 Anusol-----Aguasol
 Aralen-----Arlidin
 Arlidin-----Aeroline
 Atarax-----Enarx
 Azotrex-----Afredex

B

Belladonna-----Belladenal
 Benadryl-----Belladenal
 Benadryl-----Bentyl
 Benadryl-----Benylin
 Benemid-----Beminal
 Bentyl-----Aventyl
 Benuron-----Enduron
 Betalin-----Benylin
 Bicillin-----V-Cillin
 Bontril-----Vontrol
 Brondecon-----Bronkotabs
 Butibel-----Butabell
 Butibel-----Butisol
 Butigetic-----Butagesic

C

Calamine-----Calomel
 Calcidin-----Calcidrine
 Calurin-----Saluron
 Capla-----Keflin
 Cedalanid-----Acetanilid
 Chloromycetin-----Chlor-Trimeton
 Codeine-----Cordran
 Combid-----Combex
 Compazine-----Compocillin

Compocillin-----Ampicillin
 Consotuss-----Cotussis
 Coramin-----Calamine

D

Daricon-----Darvon
 Decadron-----Percondan
 Decagesic-----Donnagesic
 Delalutin-----Deladumone
 Delta-Dome-----Deltasone
 Demerol-----Dicumarol
 Deprol-----Demerol
 Desbutal-----Desoxyn
 Desoxyn-----Digitoxin
 Dexameth-----Dexamyl
 Dialose-----Dialog
 Dialose-----Dialose
 Digoxin-----Desoxyn
 Dilantin-----Delalutin
 Digitoxin-----Digoxin
 Disophrol-----Isuprel
 Diuril-----Doriden
 Diutensen-----Salutensin
 Diutensen-----Unitensin
 Donnatal-----Dianabol
 Donnatal-----Donnagel
 Doriden-----Doxidan
 Doriden-----Loridine
 Doxan-----Dixidan
 Duragesic-----Duo-Gesic
 Dyazide-----Thiamide
 Dyrenium-----Pyridium

E

Ecotrin-----Edecrin
 Elase-----Alidase
 Elavil-----Aldoril
 Elavil-----Marax
 Enduron-----Eutron
 Equagesic-----Decagesic
 Esimil-----Estinyl
 Esimil-----Ismelin
 Estomul-----Isomel
 Eutonyl-----Eutron

F

Feosol-----Feisol
 Feosol-----Feostat
 Feosol-----Fer-In-Sol
 Feosol-----Festal
 Fostex-----PhisoHex
 Fulvicin-----Furacin

G

Gantrex-----Kantrex
 Gantrisin-----Gantanol
 Garamycin-----Terramycin
 Gevral-----Gevrine
 Glucola-----Clural

H

Haldrone-----Haldol
 Halodrin-----Haldol
 Halotestin-----Halothane
 Hiprex-----Herplex
 Hyadrine-----Hydergine
 Hycomine-----Hycodan

I

Imferon-----Infron
 Imuran-----Imferon
 Inderal-----Isordil
 Indocin-----Lincocin
 Isordil-----Isuprel

K

Kaomin-----Kaon
 Kaon-----Kao-Con
 Kemadrin-----Coumadrin
 Keflex-----Keflin
 Ketostix-----Ketosox

L

Lidaform-----Vioform
 Londine-----Lertine
 Luride-----Loryl

M

Maalox-----Maolate
 Maalox-----Marax
 Marax-----Atarax
 Mebaral-----Mellaril
 Mebaral-----Tegretol
 Medaprin-----Edecrin
 Medaprin-----Ecotrin
 Medrol-----Mebaral
 Meprobamate-----Mepergan
 Meprobamate-----Mepridine
 Mesantoin-----Mestinin
 Methergine-----Methergine
 Methadone-----Maphyton
 Methortrexate-----Meprobamate
 Modane-----Mudrane

N

Nasocon-----Vasocon
 Negatan-----NegGram
 Nembutal-----Myambutal
 Niacin-----Niamid
 Nialex-----Nicolex
 Nico-Span-----Nitrospan
 Nilevar-----Noludar
 Nisine-----Visine
 Nitroglycerine-----Nitroglyin
 Norlestrin-----Novahistine
 Norlutate-----Norlutin

O

Omnadin-----Ominpen
 Omipen-----Unipen
 Orabiotic-----Otobiotic
 Orabiotic-----Urobiotic
 Oracon-----Oreton
 Orase-----Orinase
 Oretic-----Oreton
 Oridine-----Loridine
 Orinase-----Ornade
 Omex-----Ornade
 Otagine-----Auralgan
 Otobiotic-----Urbiotic
 Ovlin-----Ovulen

P

Palocillin-----Polycillin
 Pamcillin-----Polycillin
 Pantopon-----Percogesic
 Paregoric-----Percogesic
 Percodan-----Percobarb
 Percodan-----Percorten
 Periactin-----Taractan
 Periactin-----Percodan
 Phenobarbital-----Pentobarb
 Persantine-----Persistin
 Persantine-----Trasentin
 Persantine-----Tranxene
 Phenaphen-----Phenergan

Q

Quinidine-----Quinine
 Quinora-----Quinolor

R

Rabellon-----Robinul
 Regroton-----Hygroton
 Rifadin-----Ritalin
 Ritalin-----Ismelin

S

Sansert-----Cenasert
 Sansert-----Singoserp
 Sedatole-----Cidicol
 Serenium-----Dyrenium
 Spectrocin-----Spartocin
 Surfak-----Sur-bex
 Synar-----Synalar
 Synthroid-----Synthaloid

T

Taractan-----Tinactin
 Tedral-----Teldrin
 Tegopen-----Tegretol
 Tegopen-----Tegrin
 Termaril-----Demerol
 Tepanil-----Termaril

Tepanil-----Terfonyl
 Terfonyl-----Toleron
 Thiamine-----Thiomerin
 Triamcinalone-----Triaminacin
 Tuinal-----Tylenol
 Tyzine-----Visine

U

Unipen-----Unicap
 Unitensen-----Salutensin

V

Vigran-----Wigraine

W

Wyamine-----Wydase

Z

Zactirin-----Saccharin
 Zarotin-----Zentron

VIII. Regulations Pertaining to Labeling

A. General Provisions

1. Regulations pertaining to labeling apply to all medications not just prescription medications. A common medication like aspirin will have the following information on its label:
 - a. No false or misleading statement.
 - b. Dosages and frequency must be clearly stated and must not be dangerous to health when used as recommended on the label.
 - c. Name, business address, and lot number of the manufacturer.
 - d. An accurate statement of the contents.
 - e. A warning if the medication is habit forming.
 - f. Quantity, kind, and proportion of specific ingredients.
 - g. Directions for use and contraindications, with adequate warnings for:
 - i. children
 - ii. persons with disease conditions
 - h. Expiration date of the medication
2. However, when medications are dispensed in a prescription bottle, some information will be excluded. Check your facility policy for further information.

B. Controlled Substance Act, 1970

1. The Comprehensive Drug Prevention and Control Act was passed by Congress in the fall of 1970. This new statute, commonly referred to as the "Controlled Substances Act," is designed to improve the administration and regulation of the manufacturing, distributing, and dispensing of "MEDICATIONS THAT PRODUCE OR SUSTAIN EITHER MENTAL OR PHYSICAL DEPENDENCE" (habit forming).

TABLE 1.1

**MAJOR FEATURES OF THE FEDERAL COMPREHENSIVE DRUG ABUSE
PREVENTION AND CONTROL ACT OF 1970**

<u>SCHEDULE</u>	<u>CONTROLLED DRUGS (as of 10/82)</u>
Schedule I - drugs with high abuse potential and no accepted medical use.	Heroin, Hallucinogens.
Schedule II - drugs with high abuse potential and accepted medical use.	Narcotics (morphine and pure codeine), cocaine, amphetamines, short-acting barbiturates, (Percodan, Tylox, Nemutal).
Schedule III - drugs with moderate abuse potential and accepted medical use.	Moderate and intermediate acting barbiturates, preparations containing codeine plus another drug, (Tylenol #3 and Codeine, Dalmane, Restonil).
Schedule IV - drugs with low abuse potential and accepted medical use/prescription needed.	Phenobarbital, chloral hydrate, anti-anxiety drugs (Valium, Librium).
Schedule V - drugs with low abuse potential and accepted medical use/OTC-sign out for drug on the narcotic register.	Narcotic drugs used in limited quantities for antitussive and anti-diarrhea purposes. Donnagel PG) some cough syrups.

LESSON 1

INSTRUCTOR'S NOTE

SEE SUPPLEMENT #1 FOR PROFESSIONAL AND OCCUPATIONAL STANDARDS FOR PHARMACIST

RECOMMENDATIONS:

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LESSON 2: BASIC PHARMACOLOGY

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Define medication therapy.
2. Name the four sources of medications.
3. Define medication names.
4. Know the most common abbreviations used to designate time and frequency of drug administration.
5. Describe six factors that can influence the effectiveness of a medication.

Medication is an important part of health care for many individuals in group homes. The individuals and residential staff must be knowledgeable regarding the different names, uses, actions, and adverse effects of all medication that is being administered. Each individual reacts differently to medication. Factors such as health, age, body size, and internal functions can and do alter the effectiveness of medications. Residential staff members must recognize the limits of their ability and knowledge, and seek the advice and assistance of the staff nurse, pharmacist, or doctor when needed.

I. Medication Therapy

Medication therapy may be defined as treatment by the use of substances that cure, relieve, prevent and diagnose disease. Many of the medications used today have been in use for thousands of years. Ancient records show that herbs, seeds, barks, and other substances were collected and steeped into potions for treating the sick.

II. Four Sources of Medications

"Fire properly controlled" is "Man's best friend", uncontrolled it's his worst enemy. The same statement might well be applied to drugs. Properly used, drugs are a great blessing to mankind; indiscriminately or improperly used, they could destroy the race.

Pharmacology is as old as the story of mankind. Humans have always experienced illness and injury. They have searched for the means of combating disease and caring for the wounded. This search for healing techniques marks the progress of civilization.

Mankind's early attempts at using remedies resulted in several discoveries. By observing animals, they learned the **therapeutic** properties of many plants, waters, and muds. The theory that disease was a manifestation of evil spirits resulted in attempts to cure disease by driving out the spirits with noxious materials. This experimentation led to the beginning of medicine, for some of these treatments did recover the patient.

The word "drug" is derived from the Dutch word "droog" meaning dry. Most early drugs were dried plants or plant products. Today, drugs are derived from four main sources:

1. Animal i.e. insulin, thyroid
2. Plant i.e. digitalis-digoxin-penicillin
3. Mineral i.e. calcium-lithium-magnesium
4. Synthetic i.e. ampicillin-phenobarbitol

Drugs are chemical compounds that act in various ways on the body. They may alter the body's chemical reactions, reverse a disease, relieve symptoms, maintain health, prevent disease, alter a normal process or aid in diagnosis. For example, psychotropic medications alter the body's chemical reactions and birth control pills alter a normal process.

III. Medication Names

Medications are chemicals that have rather long, difficult, chemical names. Consequently, all medications are given a shorter name, known as the **GENERIC** name. When the medication is manufactured, it is given a third name known as the **BRAND** or **TRADE** name. Several companies may market the same generic medication, there may be several different trade names for any one medication. The following example will illustrate the various names for phenobarbital.

Chemical Name: 5,5=phenylethylbarbituric acid
Generic Name: phenobarbital
Trade Names: Luminar^R, Eskabarb^R, Barbital^R

The first letter of the trade name is capitalized. The Symbol ^R to the right of the name indicates the name is registered and its use restricted to the manufacturer of the medication who is the legal owner.

A generic name is generally not capitalized. Presently physicians are encouraged to prescribe generic drugs; they may be less expensive than brand name.

EXAMPLES OF BRAND NAMES AND GENERIC NAMES:

<u>BRAND NAME</u>	<u>GENERIC NAME</u>
Achromycin, Sumycin	Tetracycline
Acthar	Adrenocorticotropic Hormone
Adrenalin	Epinephrine
Afrin	Oxymetazoline
Aldomet	Methyldopa
Amoxil	Amoxicillin
Antepar	Piperazine
Antiminth	Pyrantel Pamoate
Aquasol A	Aqueous Vitaimin A
Aquasol E	Aqueous Vitamin E
Aquamephton	Vitamin K
Aristocort	Triamcinolone
Artane	Trihexphenidyl HCl
Aspirin	Acetylsalicylic Acid
Ascorbic Acid	Vitamin C
APC	Aspirin, Phenacetin and Caffeine
Atarax	Hydroxyzine HCl
Aventyl	Nortriptyline
Baciguent	Bacitracin
Benadryl	Diphenhydramine HCl
Betapen VK	Potassium P Penicillin
CeViSol	Vitamin C drops
Chloremycetin	Chloramphenicol
Cleocin	Clindamycin HCl
Cogentin	Benztropine HCl
Compazine	Prochlorperazine
Cordran	Flurandrenolide
Coumadin	Warfarin Sodium
Cytomel	Sodium Liothyronine
Darvon	Propoxyphene HCl
Darvon Compound 65	Propoxyphene, Aspirin, Phenacetin & Caffeine
Decadron	Dexamethasone
Depro-Provera	Medroxy-progesterone
Desenex	Zincundecate
Dexedrine	Dextroamphemine
Diamox	Acetazolamide
Dimetane	Brompheniramine maelate
Diodoquin	Diiodohydroxyquin
Diuril	Chlorothiazide
Dilantin	Diphenylhydantoin
Dramamine	Dimenhydramine
Dulcolax	Bisacodyl
Elavil	Amitriptyline HCl
Empirin	APC (Aspirin, Phenacetin and Caffeine)

<u>BRAND NAME</u>	<u>GENERIC NAME</u>
Equanil	Meprobamate
Equagesic	Etholheptazine, Meprobamate
Erythrocin	Erythromycin
Feosol	Ferrous Sulfate
Flagyl	Metronidzole
Fluogen	Influenza Vaccine
Furacin	Nitrofurazone
Furadantin	Nitrofurantoin
Gantanol	Sulfamethoxazole
Gantrisin	Sulfisoxazole
Garamycin	Gentamycin
Haldol	Haloperidol
Ilosone	Erythromycin Estolate
Isopto Carpine	Pilocarpine
Isuprel	Isoproterenol
Keflex	Cephalexin
Kefzol	Cephazolin
Kenolog	Triamcinolone
Lanoxin	Digoxin
Larodopa	Levodopa
Lasix	Furoseminde
Lincocin	Lincomycin HCl
Lomotil	Diphenoxylate HCl
Luminal	Sodium Phenobarbital
Macrodantin	Nitrofurantoin
Mandelamine	Methenamine Mandelate
Marezine	Cyclizine
Mellaril	Thionidazine HCl
Mephyton	Vitamin K
Mesantoin	Mephenytoin
Milk of Magnesia	Magnesium Hydroxide
Minocin	Minocycline
Mintezol	Thiabendazole
Mycostatin	Nystatin
Mysoline	Primidone
Mysteclin F	Tetracycline and Amphoteracin B
Navane	Thiothixene
Neosynephrine	Phenylephrine
Noctec	Chloral Hydrate
Paregoric	Tincture of Camphorated Opium
Periactin	Cyproheptadine
Phenergan	Promethazine
Polaramine	Dexchlorpheniramine maelate
Polycillin	Ampicillin
Povan	Pyrvinium
Premarin	Conjugated estrogens

<u>BRAND NAME</u>	<u>GENERIC NAME</u>
Principen	Ampillicin
Prolixin	Fluphenazine
Prostaphlin	Sodium Oxacillin
Pyrilgin	Dipyrone
Quinaglute Duratabs	Quinidine Gluconate
Rau sed, Sarpasil	Reserpine
Ritalin	Methylphenidate
Rubramin	Vitamin B-12
Seconal	Secobarbital
Senokot	Senna fruit extract
Selsun	Selenium Sulfide
Serentil	Mesoridazine
Serpasil	Reserpine
Sinequan	Doxepine
Stelazine	Trifluoperazine HCl
Sudafed	Pseudoephedrine HCl
Sulamyd	Sulfacetamide
Sultrin	Triple Sulfa
Sumycin	Tetracycline HCl
Surfak	Diocetyl sulfosuccinate
Synalar	Fluocinolone Acedtonide
Talwin	Pentazocine
Tegopen	Sodium Cloxacillin
Tegretol	Carbamazepine
Tetrex-S Syrup	Tetracycline
Terramycin	Oxytetracycline
Thermotabs	Buffered Salt (NaCl) Tablets
Thorazine	Chlorpromazine HCl
Tinactin	Tolnaftate
Tigan	Trimethobenzamide
Tofranil	Imipramine HCl
Toin Unicelle	Diphenylhydantoin
Tridesilon	Desonide
Tylenol	Acetaminophen
Unicap, Theragran	Multivitamins
Valium	Diazepam
V-Cillin K	Potassium P Penicillin
Veetids	Potassium P Penicillin
Vibramycin	Doxycycline Hyclate
Valisone	Betamethasone
Visine	Tetrahydroxoline HCl
Vioform	Iodochlorhydroxyquin
Vistaril	Hydroxyzine pamoate
Zarontin	Ethosuxamide
Zylocaine	Lidocaine

IV. Weights and Measurements

Measurement has always been an important part of prescribing and administering medications. This is so because different amounts of medication present different effects. Some medications are deadly poisons, but when given in tiny amounts can help relieve disorders. Other medications are useless for therapy unless given in large amounts. Most medications have a certain dosage range, that is, a range of quantities that can produce therapeutic effects. Doctors prescribe an amount within the dosage range depending on how strong an effect is needed and on the individuals age and physical condition. Doses less than the dosage range do not produce any therapeutic effects. Doses more than the dosage range are harmful to the body and can be fatal.

To get the desired effects physicians and pharmacists through the ages have tried to make dosages very exact by measuring medications carefully. However, they have not all used the same units of measurement. There are different measurement systems, each having its own units of weight and volume. The three systems of measurement used in ordering medications are APOTHECARY, METRIC, and HOUSEHOLD SYSTEM.

Regardless of the system used by the physician and/or pharmacist, medications obtained from the pharmacist are generally labeled according to the household system. The household system is used because we need to be able to administer medications in doses that can be measured with utensils we have on hand (teaspoon, tablespoon, etc.). Most of us have grown up using this household system and are comfortable with the units of weight and volume. However, you should also have knowledge of the other systems.

V. Abbreviations

Abbreviations are a kind of "shorthand" for writing medication orders. They are a quick, convenient way to summarize instructions on what medication to give and how to give it. It is traditional for doctors to write medication orders in Latin, the language of medicine. Most of the abbreviations used are shorthand versions of Latin words. For example, stat is derived from "statim" which means "immediately" and p.o. is from "per os" which means "by mouth".

MEASUREMENTS

Calculating medication doses is done by the RN or the Pharmacist only. If there is a difference between the dose ordered and the dose on hand, the RN or Pharmacist must be contacted. They will instruct the non-licensed personnel what to do.

EQUIVALENT MEASUREMENTS YOU WILL NEED TO BE FAMILIAR WITH:

The law prohibits the Medication Attendant from altering any dosages received from the pharmacist; however it is important for you to be able to recognize and understand why the pharmacist may have filled the prescription from the physician with an equivalent.

Liquid Measures

1 ml	=	1 cc
5 ml (=5 cc)	=	1 fluid dram
5 ml (=5 cc)	=	1 tsp
1 tsp	=	1 fluid dram
30 ml (= 30 cc)	=	1 fluid ounce
500 ml (=500 cc)	=	1 pint
1,000 ml (=1,000 cc)	=	1 quart

Weight Measures

15 mg	=	1/4 gr
30 mg	=	1/2 gr
60 mg	=	1 gr

Conversion Chart

1000 ml	=	1 quart	10 mg	=	1/6 grain
30 ml	=	1 fluid ounce	1 mg	=	1/60 grain
4 ml	=	1 fluid dram	2 tbsp	=	1 fluid ounce
1 ml	=	15 minims	1 tbsp	=	1/2 fluid ounce
30 gm	=	1 ounce	1 tsp	=	5 cc
15 gm	=	4 drams	30 ml	=	1 fluid ounce
1 gm	=	15 grains	1 cc	=	15 drops
60 mg	=	1 grain			

Half Dose and Double Doses

Most tablets come in 50 mg, 100 mg, or 250 mg weight measurements. Thus if the drug calls for 25, 50, 100, 200, 125, or 500 mg, then you will likely see that pharmacist has filled the prescription with a half a tablet or two tablets. This will depend upon the dose needed and the weight of the normal tablet. The following chart should cover most of the tablet orders you will have.

<u>WEIGHT OR NORMAL TABLET</u>	<u>WEIGHT PRESCRIBED</u>	<u>WHAT YOU WILL ADMINISTER</u>
50 mg	25 mg	1/2 tablet
50 mg	100 mg	2 tablets
100 mg	200 mg	2 tablets
250 mg	125 mg	1/2 tablet
250 mg	500 mg	2 tablets

- If you have any questions about the amount you are to give, check with the pharmacist.

Medication compressed into tablets comes in two forms: **scored and unscored.**

1. **Scored tablets** have a line running through the tablet which allows the tablet to be broken easily in order to make half-tablet doses. These are the only tablets that should be broken in order to give a half dose.
2. **Unscored tablets** are of two different forms: sugar-coated tablets and enteric-coated tablets. These may not be broken for half doses.
 - a. Sugar-coated tablets are usually smooth and glossy. The sugar coating conceals the bad taste of the drug.
 - b. Enteric-coated tablets are treated so they can pass through the stomach unchanged and then disintegrate in the intestine. This is used because the drug may be irritating to the stomach or because it will be more effective if absorbed in the intestine. Enteric-coated tablets must not be crushed.

VI. Abbreviations Used to Designate Time and Frequency

A. Abbreviations used to specify the number of times per day:

1. bid - twice a day
2. tid - three times a day
3. qid - four times a day
4. qd - daily
5. qod - every other day
6. hs - at bedtime
7. ac - before meals
8. pc - after meals
9. qHS - every night at bedtime

B. Abbreviations used to specify the number of hours between doses:

1. qh - every hour
2. q2h - every two hours
3. q3h - every three hours
4. q4h - every four hours

C. Abbreviations used for medications ordered as needed:

1. **ad. lib.** - as desired
2. **stat** - immediately, now
3. **s.o.s.** - if necessary, one time only
4. **prn** - as needed-usually ordered with a certain time interval
Example: Tylenol 2 tabs q4h pm for pain -- The pm means that the medication is given when the individual needs it. The q4h is a safeguard, meaning that if a individual should need another pm dosage, it should be given at least four hours after the first pm dosage.

D. Medication ordered qd should be given at the same time each day. Be sure to know the time schedules for daily medication for your agency.

SUMMARY OF COMMON ABBREVIATIONS

WORD ELEMENT	REFERS TO OR MEANS	WORD ELEMENT	REFERS TO OR MEANS
aa	of each	OD	right eye
ac	before meals	OS	left eye
ad lib	as desired	os	mouth
bid	twice a day	OU	both eyes
B/P	blood pressure	oz	ounce
c	with	pc	after meals
CAP	capsule	per	by means of
cc	cubic centimeter	PM.pm	afternoon, evening
cm	centimeter	po, PO, per os	by mouth, orally
c/o	complained of	PRN, pm	when necessary
dr	dram	pt	pint
elix	elixir	q	every
GI	gastrointestinal	qd	every day
g, GM, gm	gram	q3h	every 3 hours
gr	grain	qid	four times a day
gtt, gtts	drop (s)	qod	every other day
h, hr	hour	qt	quart
IM	intramuscular	RBC	red blood cell
IV	intravenous	s,	without
kg, KG	kilogram	SC, subc, subq	subcutaneous
L	liter	sig	label
lb	pound	stat	immediately
med, meds	medication (s)	sol	solution
m, min	minim	supp	suppository
mEq, meq	milliequivalent	tab	tablet
mcg	microgram	tbsp, T, Tbs	tablespoon
mg	milligram	tid	three times a day
ml	milliliter	tsp, t	teaspoon
NPO, npo	nothing by mouth	Ung	ointment
od	overdose	WBC	white blood cell

Symbols used on prescriptions to denote quantity or number:

ss	=	ONE-HALF	III	=	THREE
I	=	ONE	V	=	FIVE
II	=	TWO	X	=	TEN

VI. Factors about Medications that Influence Effectiveness

A. Absorption occurs when medication moves from the site of administration into the bloodstream.

1. Route of administration affects absorption.

- a. Oral medications are absorbed slowest.
- b. Sublingual is faster than oral.
- c. Injectable drugs are absorbed faster and more completely than oral.
- d. Inhaled drugs are absorbed rapidly.

2. The form of an oral medication affects how fast it is absorbed.

- a. Oral drugs often must be mixed with fluids to be absorbed.
- b. Liquid medications absorb more rapidly than solids.
- c. Sustained release tablets and capsules absorb slowly.
- d. Enteric coated tablets are not absorbed until they reach the intestine.

3. The chemical composition of a medication determines whether it will be absorbed in the stomach or the intestine.

- a. Acidic medications are absorbed in the stomach (Example: aspirin).
- b. Alkaline medications are absorbed in the small intestine (Example: quinidine).

4. Dosage

- a. Usually calculated by body weight.
- b. Changes in body weight may change the dosage of medication required to produce a desired effect.
- c. Changes in age may require changes in dosage.
- d. Changes in kidney function may require changes in dosage.
- e. Addition or deletions of other medications may require changes in dosages.

5. The rate at which a medication is absorbed may change given the following factors:

- a. Decreased saliva production
- b. Decreased gastric juice in the stomach
 - i. Oral medications usually absorb faster if the stomach is empty.
 - ii. Absorption may be delayed by food.
 - iii. Food may prevent some medications from being absorbed (Examples: milk with tetracyclines).

- c. Decreased movement of the esophagus and stomach muscles.
- d. One medication may delay or prevent another from being absorbed (Examples: antacids with tetracyclines, antacids with iron products).
- e. Fluids taken with oral medications increase the rate of absorption.

B. Metabolism of biotransformation is the process by which a substance is changed into a form that is more easily excreted by the body.

1. Most drugs are metabolized by the liver.
2. Kidneys, lungs, and intestines also help metabolize drugs.
3. Some drugs can be excreted unchanged, but most must be metabolized.
4. Different drugs are metabolized at different rates.
5. If metabolism is decreased, then medication will accumulate in the blood and cells.
6. If metabolism is increased, then more medication will be required to produce the same effect (tolerance).
7. The age of the individual affects the metabolic rate.
8. Adverse effects will appear mainly in the liver and kidneys.

C. Medication Elimination

The effects of a medication cease when the medicine has been eliminated from the body. Medications are eliminated by the lungs, kidneys, intestines, skin or saliva. However, bear in mind that many medications build up in the body and when the medication is stopped, the effects may continue for several days until it is completely eliminated from the body.

Excretion is a process by which a drug is eliminated from the body.

1. Most oral and parenteral medications are excreted by the kidneys through the urine.
 - a. Some drugs are excreted in their original form, most are changed by metabolism before excretion.
 - b. All medications excreted by the kidneys are dissolved in the urine relative to the amount of fluid intake.
2. Some oral medications are excreted by the intestines, through the feces.
3. Inhalant medications, such as ether, are excreted by the lungs through breathing.

D. The amount of physical activity is thought to affect the rate of drug action.

- E. Chronic illness, such as diabetes and heart failure, may change the body's response to medication.
- F. Pain and anxiety may increase the amount of medication required to bring about a desired effect.
- G. Other emotional factors such as worry, fear and sorrow may change the amount of medication required.
- H. Other chemicals present in the body may affect the potency of a drug.
Example: alcohol decreases the effect of some antibiotics but increases the effect of tranquilizers, such as Valium and Librium.

VII. Drug Information

- A. Action of the drug--how the drug provides its therapeutic effect.
- B. Use--what the drug is commonly prescribed for.
- C. Adverse effects--an undesirable side effect of a medication.
- D. Special considerations--listing of useful information including contraindications and precautions. Some suggestions for prevention and treatment are included.
- E. More complete information about a drug may be obtained by consulting one of the many drug resource books available. If you have further questions, contact your pharmacist or staff nurse.

Answer Self Test Questions - Lesson 2: Basic Pharmacology

LESSON 2

INSTRUCTOR'S NOTE

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Lesson 3: FUNDAMENTALS OF MEDICATION THERAPY

OBJECTIVES

At the completion of this lesson you will be expected to:

1. Describe two common routes of medication administration.
2. Define systemic and local effects.
3. Define desired effects.
4. Define side effects.
5. Discuss causes of medication interaction.
6. Describe how medications are eliminated from the body.
7. Define six different types of effects that may result from a medication.

The familiar saying "no two people are exactly alike" applies well to the effects produced by medications. The same dosage of a medication may produce an intense response in one individual and no observable effects in another; the major reason for these differences is individual variation. Variation occurs as a result of several factors, any of which can influence the body's response to medications.

One of the factors which affects medication action is the route of administration. The most common routes of medication administration are oral (PO) and topical. Intramuscular, intravenous and subcutaneous routes are generally restricted to hospital use. However, you may come in contact with diabetic individuals who are taking insulin by subcutaneous injection. These injections will be administered by a nurse or self administered by the client.

A. ROUTES OF MEDICATION ADMINISTRATION

ROUTES OF MEDICATION ADMINISTRATION

ROUTE OF ADMINISTRATION	APPROXIMATE ONSET OF ACTION	INDICATIONS	EXAMPLES
Oral (PO)	30-60 minutes	Whenever possible-- general effects	Most medications, aspirin, sedatives vitamins, antibiotics
Sublingual	several minutes	When rapid effects are needed--general effects	Nitroglycerin for chest pain
Rectal	15-30 minutes	When client cannot take oral medications and also for local effects	Analgesic, laxatives, suppositories
Topical	within 1 hour	For local effects on skin, eye, ear	Creams and ointments

OTHER ROUTES OF MEDICATIONS CMA'S CANNOT PERFORM:

Subcutaneous (SC)	several minutes	For medications which are activated by the gastrointestinal tract-- general effects	Insulin
Intramuscular (IM)	several minutes	For medications which have poor oral absorption and when rapid effects are desired--general effects	Narcotic analgesic, antibiotics
Intravenous (IV)	within 1 minute	In emergency situations when effects are required	IV fluids, nutrient supplements, antibiotics

Other variations in response will be due to effects of medications. In general, there are two effects to acknowledge:

- **local effects**, which mean the effects of the medication are limited to the site of application as with topical medications, and
- **general effects**, which mean the effects will be systemic (throughout the body).

B. MEDICATION FORMS

Because of the various makeup of the different medications and the many uses some of them have, it is necessary to have different ways to prepare them for use. Listed below are the more common medication forms which you may come in contact with and which also contribute to variation of response among individuals.

ORAL FORMS

Capsules

1. Capsules are small, cylindric gelatin containers that hold a dry powder or liquid drug.
2. Capsules are a convenient way of administering medications with an unpleasant odor or taste. They are available in various sizes.
3. Capsules can contain several doses of a medication. The doses have special coatings that dissolve at different rates, so that the medicine is released in the body gradually. These timed-release capsules allow for medication effects to continue at the same level over a long period of time.

CAUTION: Never crush, open or empty the contents of a timed released capsule into food or liquid. Any of these actions could cause all of the medicine to be released at once, and the individual would receive an overdose of medicine.

4. Other words which indicate a drug is "timed-release" are sustained-release or spansule. EXAMPLE: Contact spansules.

Tablets

1. Tablets are powdered medications compressed into small disks. Many are easily dissolved. EXAMPLE: aspirin
2. Tablets may also have coatings that allow the medication to be dissolved in the intestines instead of the stomach. This is known as an enteric coating. Like time-release forms, enteric coated tables must not be crushed or mixed into food or liquid. This would destroy the enteric coating and cause the medicine to be released in the stomach instead of the intestine.
3. Tablets may also be scored (line through center) which allows the tablet to be split if necessary.

Suspension

1. Suspensions are solid, insoluble particles dispensed in a liquid.
2. All bottles of suspensions must be shaken well before use.
3. Example: Dilantin suspension--an anticonvulsant.

RECTAL/VAGINAL

Suppositories

1. Suppositories are mixtures of medications with a firm base, such as cocoa butter. They are molded into a shape suitable for insertion into a body opening, such as the rectum or the vagina.
2. Suppositories melt at body temperature. This allows the medication to come in contact with the mucous membranes of, for example, the rectum or vagina. The medication then produces a local or general effect.
3. Examples: glycerin and Dulcolax--medications to move the bowels (should be refrigerated)

TOPICAL

1. Lotions are commonly used as soothing applications to protect the skin and relieve rashes and itching.
2. Some lotions have a cleansing action, while others have a drying or drawing action.
3. To prevent increased circulation and itching, lotions should generally be patted on the skin instead of rubbed on.
4. All lotions should be shaken before using.
5. Example: calamine lotion

Gels

1. Gels are suspensions of insoluble drugs in hydrated form.
2. Example: Aluminum hydroxide gel (Amphojel)-an antacid

Extracts

1. Extracts are concentrated, solid preparations of drugs obtained by dissolving the crude drug in alcohol or water. The solution is then allowed to evaporate.
2. Example: cascara sagrada, used as a laxative

Lozenges

1. Lozenges are flat disks containing a medicinal agent in a suitable flavored base. The base may be hard sugar candy or the combination of sugar with sufficient mucilage to give it form.
2. Lozenges are placed in the mouth to slowly dissolve, liberating the antiseptic or astringent ingredient.
3. Example: cough lozenges--given to stop irritation or a dry, tickling cough

Elixirs

1. Elixirs are palatable preparations of drugs made up with alcohol, sugar, and some aromatic or pleasant-smelling substance.
2. Examples:
 - a. Elixir of terpin hydrate--a cough medicine
 - b. Elixir of phenobarbital--a sedative and anticonvulsant

Magma

1. Magma are bulky suspensions, in water, of drugs or preparations that are insoluble. They look like milk or cream.
2. Example: milk of magnesia--a laxative

Syrups

1. Syrups contain medicinal agents dissolved in a sugar and water solution. They are particularly effective for masking the taste of a drug.
2. Example: cherry syrup

Tinctures

1. Tinctures are diluted alcoholic extracts of drugs. They vary in strength from 10% to 20%.
2. Example: triamcinolone ointment--used for treatment of skin rash.

Creams

1. Creams are solid emulsions containing medicinal agents.
2. Example: hydrocortisone cream--a corticosteroid applied to rashes caused by an allergic reaction.

C. Effects of Medication

- The observable results of changes in the body:
 1. A systemic action affects the entire body.
 2. A local action affects only the area of the body where the medication has been applied.

- Effects from a single medication:
 1. Primary or desired effect.
 2. Secondary effect.
 3. Adverse effect.
 4. Allergic effect or hypersensitivity.
 5. Toxic effect.
 6. Cumulative effect.
 7. Tolerance.
 8. Idiosyncrasy.
 9. Psychological or emotional dependency.
 10. Physical dependency or addiction.

EFFECTS OF MEDICATION

Route of administration and the form of the medication will produce various effects. Most of you, at one time or another, will use some type of medication. When properly prescribed and administered, medications can have several possible outcomes. The three primary outcomes are: desired effects, side effects and no apparent desired effects.

DESIRED EFFECTS (THERAPEUTIC EFFECTS)

Medications may be prescribed to prevent or cure an illness or reduce the related symptoms. The desired effect is when the medication is working correctly. Eliminating a headache by taking aspirin is an example of a desired effect.

SIDE EFFECTS (Unwanted Effects)

Whether or not the desired effect occurs, there is always the possibility that side effects will also occur. Side effects are those produced by the medication other than the desired effects. Side effects are often called unwanted or adverse effects. This module will use the term "side effects." Side effects may be expected and predictable (such as drowsiness when taking a tranquilizer) or unexpected and unpredictable (such as increased activity when taking a tranquilizer). These effects can be minor and relatively harmless (such as urine discoloration from phenytoin) or major and potentially fatal (such as a severe reaction to penicillin). Side effects are physical or

behavioral changes that may require follow up action. It is important to remember that any change (physical or behavioral) during the first few hours or days following administration of a new medication may have been caused by the medication. As the direct care giver, you have the most contact with the individual. Therefore, you are the person best able to recognize any changes. It is your responsibility to observe, report and record any and all suspected effects of medications.

NO APPARENT DESIRED EFFECTS

All medications have different periods of time in which their full benefit is expected. However, due to unique body differences, there are sometimes no apparent desired effects. The medication has not worked within its usual time period. For example, aspirin is ordered to be administered every 4 hours for a fever. After 24 hours, the fever remains unchanged. Therefore, there has been no desired effect.

The main responsibility in this situation is to record and report the lack of desired effects. The physician may then prescribe an alternate medication or change the dosage of the present medication.

D. INTERACTIONS

Individuals may be receiving more than one medication at a time. Every medication has the potential to interact with another medication. Medication interactions are unwanted effects which are the result of being on more than one medication at a time. Some medications increase the effect of another medication, while other medications decrease the effect. The interactions may be:

- Synergistic or Potentiation one medication will increase the effects of another medication.
- Antagonistic or Against-one medication will decrease the effects of another medication.

There are two important points to remember concerning medication interactions:

1. The more medications an individual takes, the greater the possibility that a medication interaction will occur.
2. By being aware of what medications an individual is taking, the physician can prescribe a new medication that has the least chance of interacting with the medications the individual may already be taking (non-prescription medications will also cause interactions).

In addition to medications interacting, there may also be food and medication interactions. The results of **food/medication** interactions can be the same as medication interactions. Depending on the medications prescribed, some foods may be limited and others suggested. An example would be to avoid foods high in acid when taking antibiotics because antibiotics are destroyed by stomach acid. The reverse of this: increase foods high in acid when taking urinary antiseptics, as these medications work best when the body has a high acid content.

In addition to medication effects previously described, there are additional terms to be familiar with when discussing medication effects.

Medication Allergy

A response which may be immediate and life threatening or delayed and slow to appear.

Cumulation

The body does not eliminate one dose of a drug before another dose is given.

Tolerance

Resistance to the effect of a medication.

Addictive Effect

The physical or emotional dependence on certain medications.

E. Medication Elimination

The effects of a medication cease when the medicine has been eliminated from the body. Medications are eliminated by the lungs, kidneys, intestines, skin or saliva. However, bear in mind that many medications build up in the body and when the medication is stopped, the effects may continue for several days until it is completely eliminated from the body.

Answer Self Test Questions - Lesson 3 Fundamentals of Medication Therapy

LESSON 3
INSTRUCTOR'S NOTE

RECOMMENDATIONS:

ONLY BLANK SELF TEST QUESTIONS ARE IN TRAINEE'S MANUAL

COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK
ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND
CORRECT ANSWERS GIVEN AT THAT TIME

INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 4: PRINCIPLES AND FUNDAMENTALS OF ADMINISTERING MEDICATIONS

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Describe the correct procedure for disposal of controlled drugs.
2. Describe the proper manner in which medication are to be stored.
3. Describe at least three precautions which help avoid errors when preparing medication.
4. Describe the correct procedure to follow when a medication has been refused.
5. Describe the correct procedures to follow when a medication has been omitted.
6. Describe the term Universal Precautions.

PRINCIPLES OF ADMINISTERING MEDICATIONS

Preparing and administering medication requires staff to be diligent at all times. Proper handling and dispensing of medication ensures that the individual is receiving the correct medication. There are specific guidelines that must be followed in the event that a medication is not given at the correct time or a medication needs to be destroyed. It is also important for the residential staff to be aware of the guidelines for controlled substances, storing medications, and maintaining medical asepsis.

I. Medication Dispensing Procedure

- A. The doctor writes an order or co-signs telephone order taken by the staff nurse.
- B. The medication order is then sent to the pharmacist to be filled (follow your agency policy).
- C. The medication is delivered by the pharmacy or picked up at the pharmacy and stored in the designated medication area. The amount may be a single dose, or one to several days' supply:
 1. Individual medication--individual's own container labeled according to the doctor's order.
 2. Unit-dose packaging--each dose sealed, labeled and dated

II. Preparing and Administering Medications

A. Medication sheets:

1. Kept in a flip carrier or notebook
 2. Used to prepare medication
 3. Stored in medication area and used to compare each medication with the order before the medication is administered
 4. Medications should always be checked at least three (3) times prior to administration (RULE OF THREE).
 - a. compare the medication to the order before removing container from medicine cabinet.
 - b. compare the medication to the order before you pour it.
 - c. compare the medication to the order before replacing container in medicine cabinet.
 5. Using medication sheets as a preparation and administration guide enables the residential staff and the individual to chart immediately. Charting is to be done immediately.
- B. Obtain vital signs as indicated or ordered prior to pouring and administering certain medications (i.e. digitoxin).
- C. Keep good notes about medications withheld, refused, and as needed (PRN) medications.
- D. Never chart until **after** you have given the medication.
- E. Medication sheets are used to record medication orders. Follow the agency policy and ask the staff nurse for further instruction.

III. General Considerations when Administering Medications

A. Safety precautions that help to avoid errors when preparing medications:

1. Using aseptic technique when administering medications helps reduce the transfer of microorganisms from one person to another. Wash your hands before administering medication. Individuals should also wash their hands if they will be handling their own medication.
2. Good lighting should be available when preparing medications.
3. Work alone and avoid distractions and interruptions while preparing drugs. Do not leave medications unattended during preparation; if you must leave, place the medications in a locked area.
4. Read the label three times.

5. Make sure that the information on the medication sheet corresponds exactly to the label on the individual's medication. If it does not, ask the staff nurse for further instructions and check you agency policy.
6. Never administer a medicine from an unlabeled or illegibly-labeled container. Never relabel medication yourself. Instead, notify the staff nurse.
7. Some agencies may prepare medicine boxes weekly for their individuals. Follow your agency's policy.
8. Medications can be given within one hour of the prescribed time and still be effective.
9. Before giving a medication that is more than one hour late, contact your staff nurse for instructions.
10. Never borrow medication from one individual to give to another.
11. Check the expiration date. Do not give outdated or discolored drugs.
12. Never return an unused dose of medicine to its container.

B. Safety precautions that prevent errors when administering medications:

1. Address the individual by name.
2. Remain with the individual while he/she swallows the medication. Do not leave medications for the resident to take later, unless you are directed to do so by the interdisciplinary team.
3. Always check the medication sheet to make sure the medication has not already been given.
4. Do not allow anyone, including family members or other individuals, to carry or administer medication to another individual.
5. If an individual expresses doubt or concern about a dosage of medication, you must make certain that no mistake has occurred--the individual may be right. Compare the original physician's order with the label on the medication. If there is still doubt, check with the staff nurse.
6. Observe for any undesirable effects of medications. If you notice any symptoms or hear any complaints that are unusual, check with the staff nurse before administering more medication to the individual.

C. Omitted or Refused Drugs:

1. Omission of a medication should be reported as soon as it is discovered. The doctor or staff nurse will determine if the dosage should still be given.
2. Drugs may be omitted for legitimate reasons, such as suspected allergy or NPO for diagnostic tests. Be sure to chart the omission on the individual's chart according to agency policy.

3. When an individual refuses medications:

- a. Listen to the reason; if it is a refusal due to nausea or other possible adverse effect, check with your staff nurse. Always explain to the individual why it is important that he/she take the medication and that it was ordered by his/her physician.
- b. If the individual still refuses, ask for advice from your staff nurse; it is the individual's right to refuse treatment, including medication, and to receive information about the medical consequences of his/her refusal from the nurse of physician.

4. If a medication is omitted due to refusal, chart the omission on the medication sheet and chart the reason for refusal and your notification of the staff nurse

5. Omission of medication for other reasons:

a. Reasons for omission might include:

- i. Inability of individual to swallow medication
- ii. Physician's order for nothing by mouth (NPO)
- iii. For cardiotonics, pulse below 60 unless otherwise ordered by physician
- iv. Absence of individual from facility
 - aa. When the individual is away from the facility, medications are sent along.
 - bb. Medications are prepared for each scheduled time of administration, packaged, labeled, and sent with the individual.
- v. Individual has alcohol on his/her breath or appears under the influence. Contact the staff nurse for further instructions.

b. Chart an omission on both medication records and include the reason for omission.

c. Notify the staff nurse when a medication is omitted.

D. Additional observations:

1. Comments by individual
2. Signs or symptoms observed
3. Consultation with staff nurse
4. Remember to date and sign every entry on the individual's chart

E. Standing Orders

1. Used for over-the-counter medications--Example--aspirin, Maalox, cough medications.
2. Must be renewed by the physician.
3. Policies regarding standing orders are agency specific. Check with your staff nurse.

IV. Safety Precautions for Controlled Substances

- A. Controlled Substance Act of 1970--established five schedules for all controlled substances (drugs that are addictive or habit forming).
- B. Reviewed yearly--substances may be moved from one schedule to another.
- C. Five controlled substances schedules:
 1. **Schedule I**--drugs with a high potential for abuse and no currently accepted medical use, such as heroin, marijuana, LSD and research drugs.
 2. **Schedule II**--drugs with a high potential for abuse that have a medical use; every refill requires a new written order from the physician, such as morphine, Demerol (meperidine), codeine, Tylox, and Percodan.
 3. **Schedule III**--drugs with moderately high potential for abuse that are often used as medical treatment, such as medications combined with codeine (Tylenol with codeine), Doriden (glutethimide), and Butisol (butabarbital).
 4. **Schedule IV**--drugs with little potential for abuse, such as many mild sedatives and anti-anxiety drugs (tranquilizers). For example, Halcion (triazolam), Valium (diazepam), Librium (chlordiazepoxide), phenobarbital, Dalmane (lorazepam), and Talacen.
 5. **Schedule V**--drugs with a low potential for abuse that still require prescriptions, such as Lomotil (diphenoxylate).
- D. The Controlled Substance Act Requires Special Precautions:
 1. Orders for psychotropics and tranquilizers may not be refilled. The physician must write a new order.
 2. Controlled substances must be accounted for by the agency. (Follow agency policy)
 3. Special accountability forms that are used to record the use of controlled substances are required by agency policy and federal guidelines. The following information must be on the drug record.
 - a. Name of the individual receiving the drug.
 - b. Amount of drug used
 - c. Time drug was administered to the individual

- d. Name of the individual administering the drug and his or her signature
 - e. Name of the doctor who ordered the drug
 - f. Amount of the drug destroyed
- 4. The frequency that controlled substances are counted depends on agency policy. Usually psychotropics and tranquilizers and other drugs indicated by the agency are counted during visits by the staff nurse.
 - 5. Wasted or contaminated (dropped) controlled substances must be flushed in the presence of another staff member. The amount destroyed is to be documented by both staff members. Follow agency policy. **Do not flush wasted or contaminated controlled substances by yourself.**
 - 6. Follow your agency's policy for disposal of discontinued tranquilizers and/or psychotropics.

V. Storage of Medications

- A. In a locked cabinet:
 - 1. Each home will have a storage cabinet used to store tablets, capsules, and powders.
 - 2. Topical medication or those for instillation must be stored in separate containers or on a separate shelf from orals to avoid contamination and errors in administration.
- B. Some medications must be refrigerated in a locked box.
 - 1. Refrigeration prevents medication from spoiling and maintains its consistency.
 - 2. Insulin and other injectables are usually kept in a refrigerator.
 - 3. Liquid antibiotics must be refrigerated to maintain their potency.
 - 4. Most suppositories are refrigerated to maintain their potency.
 - 5. Any other medications marked "Refrigerate" by the pharmacist must be kept in the refrigerator.

VI. Key Points about Maintaining Medications

- A. Medications are never stored in an area easily accessible to the public.
- B. Medicine cabinets are always locked when not in use.
- C. Labels on medications are kept clean and readable.
 - 1. If the label is not readable, notify the staff nurse, do not relabel the medication. A pharmacist must relabel medications.
 - 2. Never administer a medication from a container that has an unreadable label.

- D. Keep medications securely capped to maintain their potency--chemical changes can occur when medication is exposed to air.
- E. Many medications are dispensed in dark bottles that prevent their exposure to light.
- F. Do not use outdated medications--before giving medications always check the expiration date on each medication.
- G. Report to the staff nurse changes in consistency, odor, or color of a medication. (Follow agency policy).
 - 1. If any of these changes are observed, **do not** administer the medication.
 - 2. Give any changed medication to the staff nurse or pharmacist.

VII. Ordering, Receiving, and Disposing of Medications

- A. Ordering medications: Check your agency's policy for guidelines on ordering medications.
- B. Receiving--Medications must be signed for, checked against the list of medications ordered, and put away properly by the assigned medication personnel. Check agency policy for specific guidelines.
- C. Disposing of medications:
 - 1. If a medication has expired, do not give it to an individual. Inform the staff nurse--the agency policy will determine how to dispose of it.
 - 2. Contaminated medication (such as medicine dropped on the floor) should be destroyed according to agency policy. Usually it is flushed down a drain by the staff nurse in the presence of another staff member. It must also be documented on the individual's medication sheet and signed by two witnesses.
 - 3. Unit-dose medication that has been refused by an individual, but not contaminated or opened, may be returned to the individual's individual drug supply.
 - 4. Discontinued medications should be removed immediately from the individual's drug supply and packaged for the staff nurse.
 - 5. When a individual is transferred, the staff nurse will document the name and number of all medications sent with the individual.

VIII. Aseptic (clean) Technique in Medication Maintenance

- A. Cleanliness protects the individual from disease.
- B. Frequent and careful hand washing is the most effective way to avoid spreading organisms that cause disease.
- C. Keep the medication storage area clean.
- D. Clean all equipment after each use.
- E. Wipe the outside of bottles containing liquid with a clean, wet cloth. Do not wipe the rim.
- F. Touch only the outside of medication containers, not the inside.
- G. Universal precautions (see Guidelines for Universal Precautions at the end of this lesson) are to be observed when coming in contact with a individual's body fluids.
- H. Pour medications into appropriate containers, **NOT** into your hand.

IX. Hand Washing Using Medical Asepsis--The single most important step you can take to prevent the spread of infection is proper hand washing.

- A. Remove your watch and rings if you are wearing any.
- B. Turn on the water.
- C. Regulate the water to a comfortable temperature.
- D. Wet your hands.
- E. Apply soap to your hands.
- F. Wash your palms and the backs of your hands.
 - 1. Use at least 10 rotary motions.
 - 2. Use at least 10 friction motions.
- G. Wash your fingers, your thumbs, your knuckles, and between your fingers.
- H. Interlace your fingers and rub them up and down at least 10 times.
- I. Wash underneath your fingernails.
- J. Point your hands down toward the drain and rinse them thoroughly under the running water.

K. Wet your wrists and forearms.

L. Apply soap to your wrists and forearms.

M. Wash your wrists and forearms.

1. Use at least 10 rotary motions.
2. Use at least 10 friction motions.

N. Point your arms down toward the drain and rinse thoroughly, beginning at your elbows and ending at your fingertips.

O. Blot your hands and arms dry.

1. Begin at your forearm and blot down to your fingertips.
2. Use clean paper towels.

P. Turn off the water without breaking sepsis (use a clean paper towel to turn off the faucets).

X. Guidelines for Universal Precautions (See following pages)

Recommended Guidelines for Universal Precautions

These guidelines are designed to assist facilities and individuals in the use of universal precautions that are necessary to prevent the spread of HIV infection and other dangerous communicable diseases.

OVERVIEW UNIVERSAL PRECAUTIONS

This overview is intended to be consistent with guidelines published as a Joint Advisory Notice of the Department of Labor and Department of Health and Human Services (Federal Register Vol. 52, No 210, Oct. 30, 1987), proposed rules of the Department of Labor (29 CFR Part 1910, Nov. 27, 1987), and guidance from the Centers for Disease Control (CDC) (MMWR Vol. 36, Aug. 21, 1987) and MMWR, Vol. 37, June 24, 1988). It is not the intent of these guidelines to mandate protection from all possible or theoretic exposures to blood or visibly blood contaminated body fluids. Rather, the intent is to provide guidelines for protection from predictable exposure to blood or visibly blood contaminated body fluids, regardless of known or suspected HIV serologic status. These guidelines represent minimum precautions and employers are free to utilize more stringent policies for the protection of their workers.

The human immunodeficient virus (HIV), the causative agent of AIDS, is transmitted through direct contact with blood, through sexual intercourse or perinatally from an infected pregnant woman to the baby she is carrying. Blood, semen, vaginal secretions, and possibly breast milk are the only body fluids known to transmit HIV. Universal precautions also apply to tissues and to the following fluids: cerebrospinal fluid (CSF), synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid. The risk of transmission of HIV and HBV from these fluids is unknown, epidemiologic studies in the health-care and community setting are currently inadequate to assess the potential risk to health-care workers from occupational exposures to them. However, HIV has been isolated from CSF, synovial, and amniotic fluid (6-8), and HB_sAG has been detected in synovial fluid, amniotic fluid, and peritoneal fluid (9-11). One case of HIV transmission was reported after a percutaneous exposure to bloody pleural fluid obtained by needle aspiration (12). Whereas aseptic procedures used to obtain these fluids for diagnostic or therapeutic purposes protect health-care workers from skin exposures, they cannot prevent penetrating injuries due to contaminated needles or other sharp instruments.

Employees must protect themselves from direct exposure to blood or body fluids that are visibly contaminated with blood to prevent diseases, such as hepatitis, that are transmitted by body fluids such as saliva, urine or feces, regardless of contamination with blood. For this reason, it is strongly recommended that precautions be taken to prevent direct contact with all body fluids of all persons, whether or not the body fluids are visibly contaminated with blood.

1. Sterile gloves shall be worn for procedures involving contact with **normally sterile** areas of the body.
2. Use examination gloves for procedures involving contact with mucous membrane, unless otherwise indicated and for other patient care or diagnostic procedures that do not require the use of sterile gloves.
 - Examination gloves should be worn at least in situations where direct contact with blood or body fluids that are visibly contaminated with blood is likely. Examples of such situations include but are not limited to: invasive or surgical procedures; performing oral hygiene; providing wound or decubitus care; cleaning up blood contaminated vomitus, urine, or feces; and handling items or surfaces soiled with blood or blood contaminated body fluids.
 - Examination gloves are not necessary for contact with intact skin or for handling unsoiled objects previously in contact with or handled by others.
3. Examination gloves shall be removed and discarded after contact with each patient, fluid, item or surface. Hands should be washed immediately after gloves are removed. A new set of gloves should be used for contact with each person. Gloves should never be washed or wiped with any substance as this damages their integrity and increases permeability.
4. Experienced professional phlebotomists who are judged by their employer to have excellent technique may be permitted by the employer to use their judgment as to whether gloves are necessary or not on an individual basis.
 - However, employees with permission not to wear gloves shall be permitted to wear gloves at their discretion. Employers cannot deny any employee the right to protective equipment.
 - The employer shall document this permission for individual employees to be exempt from wearing gloves. Any change, e.g., withdrawal of permission, shall also be documented.
 - Even if an employee has permission not to wear gloves, gloves must be worn if hands are chapped, scratched, or with non intact skin. Also, if infection control measures requiring gloves and other protective equipment are in effect for a specific patient, these infection control measures supersede any general exclusion allowed to phlebotomists under these guidelines. For example, if a physician has ordered a patient to be in "strict isolation", this order prevails and all health care providers, including phlebotomists, should comply with the physician's order.

- Gloves must be readily available at all times. Hands shall be washed in between each individual whether gloves are worn or not.
- 5. Use general-purpose utility gloves (e.g., rubber household gloves) for housekeeping chores involving potential blood contact and for instrument cleaning and decontamination procedures. Utility gloves may be decontaminated and reused but should be discarded if they are peeling, cracked or discolored, or if they have punctures, tears, or other evidence of deterioration.
- 6. Eye protectors (goggles, glasses or shields) and face masks shall be worn for all tasks or procedures that are likely to generate sprays or splashes of blood/body fluids.
- 7. Impervious gowns or aprons shall be worn during all tasks or procedures that are likely to generate sprays or splashes of blood/body fluids.
- 8. Needles and other sharp objects shall be placed in a puncture resistant container immediately after use. Needles shall not be recapped, bent, or broken prior to disposal.
- 9. Health care workers with weeping exudative lesions or dermatitis, which cannot be securely covered, shall refrain both from direct patient care and from handling clean or soiled patient equipment.
- 10. Persons whose tasks include participation in cardiopulmonary resuscitation (CPR) should use a one-way mask when performing mouth-to-mouth resuscitation.
- 11. Linen, clothing or other materials that are visibly contaminated with blood or body fluids shall be placed in bags or containers that impervious to moisture before transport for cleaning. Gloves should be worn while bagging these materials.
- 12. Blood and other visibly blood contaminated specimens of body fluids or tissues shall be handled in accordance with infectious waste rules adopted by your facility.
- 13. An abuse of these guidelines should be reported to your supervisor or infection control chairperson.

DEFINITIONS and EXPLANATORY NOTES CONCERNING UNIVERSAL PRECAUTIONS

1. **Universal precautions** refer to the use of barrier precautions by employees to prevent direct skin or mucous membrane contact with blood or other body fluids that are visibly contaminated with blood. These precautions should be applied to blood and body fluids of ALL persons. The purpose of universal precautions is to protect individuals from HIV infection and other communicable diseases.
2. **Barrier** precautions, also known as protective equipment, include gloves, masks, gowns, glasses, goggles and face shields.
3. **HIV** - human immunodeficiency virus, the causative agent of the acquired immunodeficiency syndrome (AIDS). This virus has been isolated on at least one occasion from blood, semen, vaginal secretions, breast milk, saliva, tears, spinal fluid, amniotic fluid and urine. Blood, semen, vaginal secretions and possibly breast milk are the only fluids implicated in transmission of HIV. No cases of HIV infection have been reported from exposure to tears, saliva, urine or feces. However, other potentially dangerous communicable diseases may be transmitted by these bodily fluids in the absence of blood contamination and avoidance is recommended. Previous names of HIV include Human T-Lymphotropic Virus Type III (HTLV-III) and Lymphadenopathy-Associated Virus (LAV).
4. **HIV seropositive** refers to the medical condition of a person having positive serologic (blood) tests for antibodies to the HIV. To be considered seropositive, a person must test positive repeatedly and test positive by two different methods of testing. Currently, the enzyme linked immunosorbent assay (ELISA) is the recommended screening test and the Western Blot assay is the recommended confirmatory test.
5. **Body fluids** are any secretions or emissions from the human body. Body fluids included but are not limited to semen; saliva; tears; vomitus; urine; feces; breast milk; wound drainage; spinal and amniotic fluids; vaginal secretions; menses and mucus.
6. **Blood** is composed of both cellular and fluid components. Blood includes white and red blood cells, serum, plasma and other untreated blood products.
7. **Exposure** is defined as direct contact of blood or body fluids of one person with the skin or mucous membranes of another person.

NOTE: Scientific evidence indicates that only direct contact with semen, vaginal secretions, blood, or visibly blood contaminated body fluids carries a potential risk for HIV transmission. Moreover, only direct contact with blood has been implicated in occupational acquisition of HIV infection.

Answer Self Test Questions - Lesson 4 Principals & Fundamentals of Administering Medications

READING MATERIALS

The following articles provide supplemental information. Please note that those published before August, 1987, will not refer to universal precautions as these were not then standard procedure.

Centers for Disease Control. Morbidity and Mortality Weekly Report June, 23, 1988.

Centers for Disease Control. Recommendations for Prevention of HIV transmission in Health-Care Settings. Morbidity and Mortality Weekly Report, volume 36, number 2S, August 21, 1987.

Update: Acquired Immunodeficiency Syndrome and Human Immunodeficiency Virus Infection Among Health Care Workers. Morbidity and Mortality Weekly Report, volume 37, number 15, April 22, 1988.

Centers for Disease Control. Recommendations for Preventing Transmission of Infection with Human T-Lymphotropic Virus Type III/Lymphadenopathy-Associated Virus During Invasive Procedures. *Anals or Internal Medicine*, volume 104, pages 824-825, 1986.

Jeffrey Laurence, M.D. AIDS Therapeutics: Antivirals and Disinfectants. *Infections in Medicine*, pages 90-95, 108-109, 115. March, 1987.

John E. Conte, Jr., M.D. Infection With Human Immunodeficiency Virus in the Hospital. *Annals of Internal Medicine*, volume 105, pages 730-736, 1986.

Linda S. Martin, J. Steven McDougal, Sherry L. Loskoski. Disinfection and Inactivation of the Human T Lymphotropic Virus Type III/Lymphadenopathy-Associated Virus. *Journal of Infectious Diseases*, volume 152, number 2, pages 400-403, 1985.

Centers for Disease Control. Summary: Recommendations for Preventing Transmission of Infection with Human T-Lymphotropic Virus Type III/Lymphadenopathy-Associated Virus. Morbidity and Mortality Weekly Report, volume 35, number 23, June 13, 1986.

Centers for Disease Control. Preventing the Transmission of Hepatitis B, AIDS and Herpes in Dentistry.

Committee on Infectious Disease. Health Guidelines for the Attendance in Day-Care and Foster Care Settings of Children Infected with Human Immunodeficiency Virus. *Pediatric*, volume 79, number 3, pages 466-471, 1987.

American Academy of Pediatrics. School Attendance of Children and Adolescents with Human T-Lymphotropic Virus III/Lymphadenopathy-Associated Virus Infection. Pediatrics, volume 77, number 3, pages 430-432, 1986.

Centers for Disease Control. Education and Foster Care of Children Infected with Human T-Lymphotropic Virus Type III/Lymphadenopathy-Associated Virus. Morbidity and Mortality Weekly Report, volume 34, number 34, August 30, 1985.

LESSON 4

INSTRUCTOR'S NOTE

SEE SUPPLEMENT #4 GUIDELINES FOR DEVELOPING POLICIES AND TRAINING PROGRAMS IN UNIVERSAL PRECAUTIONS AND INFECTION CONTROL

RECOMMENDATIONS:

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COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND CORRECT ANSWERS GIVEN AT THAT TIME

**INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL**

Lesson 5: THE MEDICATION CYCLE

OBJECTIVES

At the completion of this lesson, you will be expected to:

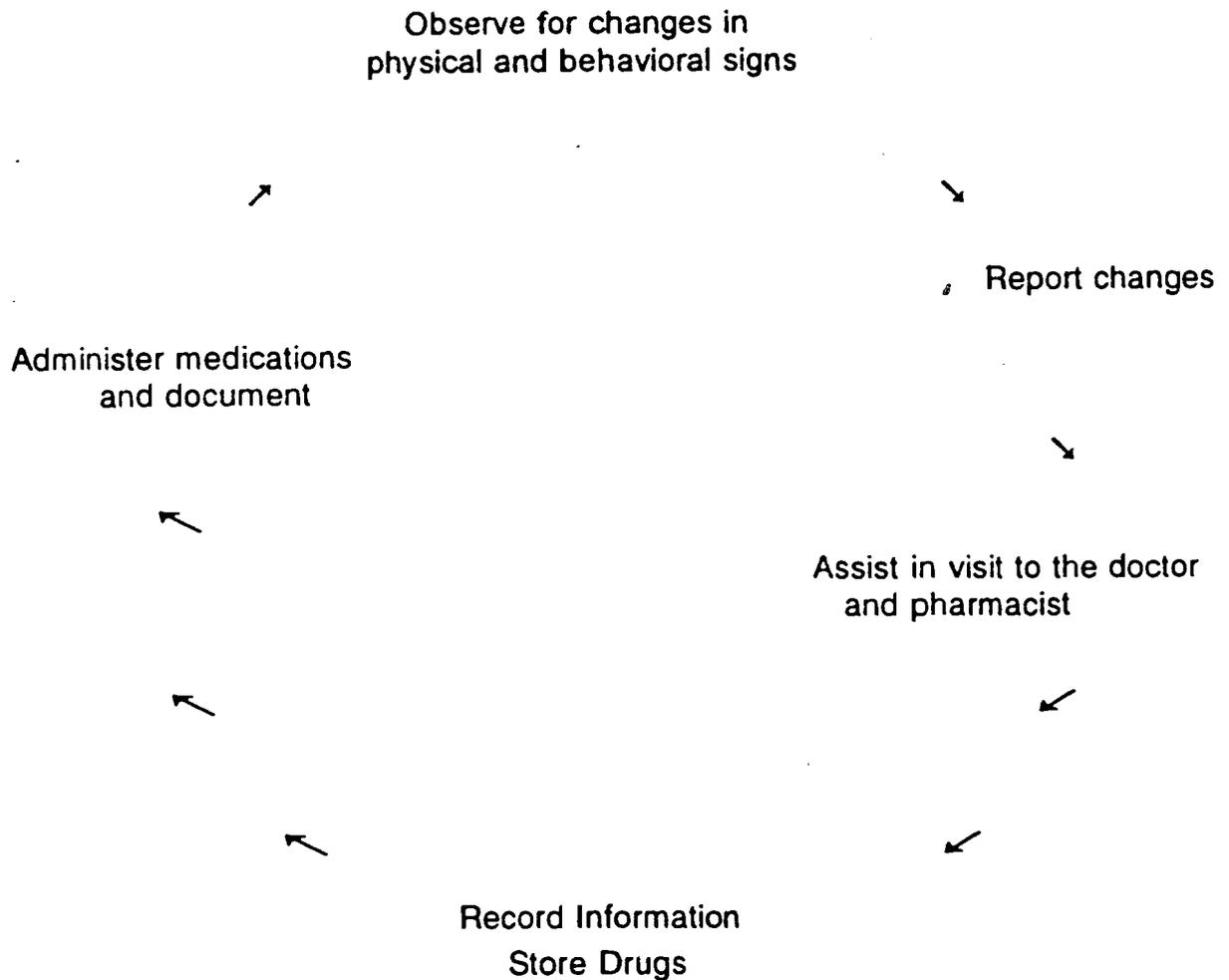
1. List the types of information which must accompany an individual when visiting a physician.
2. Discuss three (3) ways to encourage individuals to represent themselves when visiting a physician.
3. List the questions which must be asked of the physician and/or pharmacist when a new medication is prescribed.
4. Define the purpose of a prescription.
5. Relate how to verify if you have received the right medication from the pharmacy.
6. List the information transcribed by a pharmacist to the medication label.
7. Record procedure to follow for "out of residence" medication administration.
8. Define the difference between unit dose and medication in a bulk container.

MEDICATION CYCLE

Not long ago, only doctors and nurses were allowed to administer medications, but times are changing: many others in human services are now also asked to give medications. They are also expected to observe for changes which may necessitate taking the individual to see a physician, obtaining the prescribed medication, following directions for storage and recording, and administering the medication. However, responsibilities do not end at this point, for you will now be observing for changes which may be due to the medications.

MEDICATION CYCLE

The following medication cycle has been designed to guide you through six steps of medication administration.



The cycle is continuous: we start with Step 1 and go through the various steps and eventually return to Step 1. Using the cycle as a guide, you will now start with the first step.

A. OBSERVING FOR PHYSICAL AND BEHAVIORAL PROBLEMS AND/OR CHANGES

THE FIRST STEP IN THE MEDICATION CYCLE

Think back to problems or symptoms which may have prompted you to see a doctor. Possibly some of the symptoms you are thinking of include: loss of appetite, pain, fatigue, rash, and general discomfort. These symptoms may be due to physical and behavioral changes and are the same types of symptoms you may observe in individuals. Because you are the person in closest contact with the individual, your observations and descriptions of these symptoms are very important. Very often the physician will rely on your report, in addition to the individual's description of the problem.

Observing and reporting physical and behavioral changes in individuals is an important responsibility for direct care staff. You have the responsibility for the care of the individual 24 hours a day. Therefore, you are in the best position to notice any changes--physical and behavioral.

TYPES OF CHANGES

- **Objective Symptoms:** Change which can be clearly seen (e.g., cough, loss of weight, loss of appetite, vomiting, diarrhea, flushing or reddening of skin, rash, etc.)
- **Subjective Symptoms:** Change which is only perceptible to the individual (e.g., itching of the skin, tenderness or pain).

Objective symptoms are easily observed. However, in order to acknowledge subjective symptoms, you will have to ask the individual specific questions and observe his/her behavior which is inferred through "body language" (e.g., shaking head, gestures, hand movements, facial expressions, body position, expressing interest and disinterest).

It is clear that medications can be used to treat a variety of physical problems. However, there are many instances where other methods can be utilized to alleviate a physical symptom. For example: a individual says he/she has a headache. Before resorting to medications, consider these questions: Is the individual constipated? Does she/he have a fever? Is the individual saying she/he has a headache because she/he wants your attention? Exploring some of the possible reasons for a physical change will help in your explanation to the doctor when you seek direction.

- **Behavioral Changes:** The use of medications as a treatment procedure to influence behavior problems has increased dramatically in the last 20 years. Prior to the discovery of tranquilizers, behavior problems were treated with sedatives and electric shock therapy.

Strait jackets and padded cells were used for violent individuals, and last but not least, pre-frontal lobotomies were performed. Tranquilizers are classified as psychotropic medications, drugs that are "mind altering." They affect behavior, emotions, and/or intellectual processes. Although psychotropics are useful, they should be used only when all other alternative treatments have been tried and have been unsuccessful.

Observations to Chart: Report deviations from normal to Staff Nurse!

1. Vital Signs

A. Temperature--chart the following:

1. Actual thermometer reading
2. Areas of the body used for measuring the temperature
3. Example: 98.6 axillary (AX), 98.6 rectal (R), and 98.6 oral (O)

B. Respirations--chart the following:

1. Rate of respiration per minute
2. Difficulty breathing (dyspnea)
3. Difficulty breathing unless sitting (orthopnea)
4. Periods of not breathing (apnea)

C. Pulse--chart the following:

1. Rate per minute
2. Regularity

D. Blood pressure--chart the following:

1. Systolic/diastolic reading
2. Position of individual when blood pressure is taken
3. Limb from which blood pressure was taken
4. Example: BP 120/90 right arm - sitting

2. General appearance and condition

A. Skin color--chart the following:

1. Pallor
2. Flushing
3. Cyanosis
4. Jaundice

B. Skin condition--chart the following:

1. Turgor
2. Bedsores (decubiti)
3. Edema
4. Rashes/itching
5. Lacerations
6. Bruises
7. Burns
8. Inflammation/redness
9. Dryness/wetness
10. Example: 3cm x 5cm x 1cm (length, width, depth) area of coccyx. Redness decreases when individual turned on side.

C. Weakness--chart the following:

1. Loss of strength
2. General or localized
3. Example: Unequal hand grips. Right hand stronger than left.

D. Eating habits--chart the following:

1. Amount of food eaten
2. Any difficulty in swallowing
3. Difficulty in feeding self
4. Food preferences
5. Example: Individual prefers soft food. lunch: ate 1/2 meat, all vegetables, 1/2 dessert, drank all liquids.

E. Sleep--chart the following:

1. Ability to sleep at night
2. Severe drowsiness during the day
3. Statements made by the individual about sleep habits
4. Example: Individual stated difficulty sleeping last night due to another individual being noisy.

F. Weight--chart the following:

1. Accurate weight (labeled in lbs. or kilos)
2. Report variance of three (3) or more pounds to staff nurse.

3. Gastrointestinal Tract

A. Nausea, vomiting (emesis)--chart the following:

1. Color
2. Frequency
3. Amount of vomitus
4. Consistency
5. Times of nausea
6. Example: Emesis of 100 cc green, thick liquid, 3:00 a.m.

B. Abdominal distention--chart the following:

1. Variation in size of abdomen
2. Whether the abdomen is soft, hard, or painful
3. Example: Abdomen appears more distended, but remains soft.

C. Bowel movement (feces)--chart the following:

1. Amount
2. Frequency
3. Consistency
4. Color
5. Example: Individual expelled 100 cc tarry, liquid stool.

D. Mouth and gums--chart the following:

1. Bleeding
2. Soreness
3. Lesions or sores
4. Ill-fitting dentures
5. Example: Individual c/o soreness on right upper gum. States dentures "need to be adjusted."

4. Respiratory Tract

A. Respirations (see vital signs):

B. Cough--chart the following:

1. Productive or non-productive
2. Any difficulty in breathing
3. Breath odor--foul, sweet, fruity, alcohol
4. Example: Individual has productive cough of thick, yellow sputum. Alcohol odor on breath.

5. Genitourinary Tract

A. Urine (voiding)--chart the following:

1. Amount
2. Color--redness, deep brown, pale yellow, dark yellow, amber
3. Pain
4. Difficulty in voiding
5. Frequency
6. Example: Individual voiding 50 cc concentrated urine every 30 minutes. Slight pain upon urination.

B. Discharge--chart the following:

1. Color of any discharge from vagina, urethra, penis, or rectum
2. Consistency of any discharge from vagina, urethra, penis, or rectum
3. Example: Thin, watery, clear discharge from vagina.

6. Musculoskeletal System--chart the following:

A. Physical activity

1. Movements of limbs
2. Ability to walk
3. Involuntary movements
4. Tremors
5. Contractions
6. Pain, swelling
7. Exercises, including Range of Motion (ROM)
8. Example: ROM to all extremities for 5 minutes.

7. Mental and Emotional State

A. State of consciousness--chart the following:

1. Alert
2. Lethargic
3. Comatose
4. Responsive
5. Example: Individual arouses only to painful stimuli (sternal rub).

B. Emotional status--chart the following by describing what the individual is doing which might indicate the individual is:

1. Apprehensive
2. Fearful
3. Nervous
4. Distressed

5. Withdrawn
6. Happy
7. Friendly
8. Sad
9. Depressed
10. Apathetic
11. Example: Individual is pacing up and down the hall, wringing his hands, and talking to self for 30 minutes.

8. Nervous System--chart the following:

- A. Changes in sensation or movement
- B. Changes in speech--slurring, drooling, tremors of the tongue
- C. Period of vertigo, aphasia, syncope
- D. Convulsions
 1. Time convulsion occurred
 2. Part of the body affected
 3. Type
 4. Duration
 5. INJURY (IF ANY OCCURRED)
 6. Example: 15 second syncopal episode after being outdoors (T.99) for 30 minutes BP 80/60, P. 120, R. 30.

9. Pain--chart the following:

- A. Time
- B. Area
- C. Type
 1. Mild
 2. Steady
 3. Intermittent
 4. Sharp
 5. Dull
 6. Throbbing
 7. Sudden onset
 8. Gradual onset
 9. Severity
- D. Individual statement regarding pain.
- E. Example: Individual complaining of headache. Aspirin given, No relief in an hour.

10. Eyes

A. Changes in vision--chart individual's statements about vision:

1. Blurred
2. Double
3. Decreased
4. Change in pupil size
5. Sensitivity to light
6. Visual halo
7. Inability to see
8. Color of sclera
9. Recurrent headaches
10. Example: Individual c/o double vision in right eye. Staff nurse notified.

B. Physical signs.

1. Drainage
2. Itching

11. Ears

A. Changes in hearing--chart the following statements by the individual:

1. Decreased hearing
2. Presence of ringing in ear(s)
3. Pain/pressure
4. Example: Individual c/o ringing in right ear.

B. Physical signs:

1. Drainage
2. Itching

Answer Self Test Questions - Lesson 5: The Medication Cycle -- A. Observing for Physical and Behavior Problems and/or Changes.

B. REPORTING AND RECORDING PHYSICAL AND BEHAVIORAL PROBLEMS AND/OR CHANGES

THE SECOND STEP IN THE MEDICATION CYCLE

In addition to observing physical and behavioral problems and/or changes, you must know what to report, to whom to report and how to report. Agencies usually have specific policy and procedures to follow for reporting and recording observations. However, the following information is basic to most agencies.

EMERGENCY MEDICAL CONDITIONS

What to Report

There is no single rule to follow in determining what constitutes an emergency condition. It may stem from an illness or accident, resulting in a severe injury (life threatening).

Some Common Emergency Conditions:

- excessive bleeding which you are unable to control
- broken bones
- choking, not breathing, failure of respiratory system
- no heartbeat, failure of circulatory system
- behavior which poses a threat to individual, or other individuals or staff safety
- loss of consciousness not related to seizure, and
- prolonged seizure activity

When to Report

Immediately to the supervisor.

How to Report

Most agencies will have an emergency number posted by the telephone. This number will facilitate getting an ambulance. Some helpful suggestions if more than one person is available:

- one person makes call
- one person stays with individual and administers first aid, if applicable
- collect individual's medical record so that complete information can be given to the treating physician (records are not to be left with the physician)
- accompany individual to hospital with medical records

In case of emergency: Make sure you have posted in your residence the name and telephone number of the following:

- Administrative supervisor
- Ambulance
- Individual's physician

Any error involving medication shall be reported immediately to the appropriate agency personnel (according to agency policy).

If you are alone, your primary responsibility is the welfare of the individual.

■■■■■ GET HELP BUT STAY WITH THE INDIVIDUAL UNTIL HELP ARRIVES

After the Emergency

As soon as possible, inform the person on call and the individual's physician. Follow these calls with a written report in the individual's record according to agency policies.

NON-EMERGENCY MEDICAL CONDITIONS

What to Report

Potentially, health threatening conditions are those physical or behavioral signs which lead you to believe that the health or safety of the individual or others is endangered. This is a very broad definition. You know your individuals better than anyone; you know what their normal behavior patterns and physical signs are like; you have to make an interested, caring judgment as to when a health threatening condition exists.

Common sense is important here. Think of those situations (if they occurred at home) which would lead you to call a doctor, but not an ambulance. Examples:

- A fever which is not reduced by normal procedures, such as aspirin
- Repeated episodes of angry aggressive behavior which, while controllable, are not typical of the person
- Diarrhea which is not affected by prescribed medication
- A rash which lasts for several days or seems to be getting worse
- An increase in seizure activity
- Cold symptoms which last longer than a week
- Severe seizure for a individual who has a history of mild seizures

- Unusually withdrawn behavior on the part of a person who ordinarily has frequent interactions with others
- Unexplained black and blue marks
- Lack of balance or coordination

When to Report

As soon as possible after the situation is observed

To Whom and How to Report

Whenever a health threatening condition arises, notify your supervisory person on call. Report your observations and reasons why you feel this is a health threatening situation. Your supervisor will then determine whether or not the individual should be seen by a physician.

- Follow up your phone call with a written documentation as soon as possible.
- Continue to observe individual for any further changes.

OTHER HEALTH RELATED CHANGES

What to Report

Any physical or behavioral changes other than those covered before are included in this category. Any significant physical or behavioral changes could be important. They must be recorded in the client's record in order that they may be used in machine decisions regarding medications, dosages, and treatment plans. Report as soon as possible after the condition is observed.

- Examples:
- a. changes in sleep patterns
 - b. changes in bowel habits

To Whom and How to Report

Write a description of occurrence in the clients record and notify your supervisor.

When in Doubt

If you are not certain if a situation is an emergency or non emergency--treat it as an emergency. If you are wrong no harm will have been done.

Answer Self Test Questions - Lesson 5: The Medication Cycle--B. Reporting and Recording Physical and/or Behavioral Changes.

C. ASSISTING IN VISIT TO THE PHYSICIAN AND PHARMACIST

THIRD AND FOURTH STEPS IN THE MEDICATION CYCLE

ASSISTING IN VISIT TO THE PHYSICIAN

In previous sections you learned the types of behavioral and physical problems and/or changes to observe in individuals. You also studied how and when you should report any changes which you observed. In this section, you will be guided through the process of assisting the individual in a visit to the physician.

When you assist an individual in visiting the physician, there are three things which you should be aware of: you need to take specific individual information to the physician, there is certain information you should obtain from the physician, and there are certain things you need to do with the information obtained from the physician.

INFORMATION FOR THE PHYSICIAN

In order to prescribe the best medication and treatment that will offer the maximum help and minimum potential danger, the physician must have certain information.

- Give observations not opinions or diagnoses!!!

Most agencies make a practice of keeping the above information in a single place or file. However, agency policies differ. You should know the forms used and the location of the records needed to provide all the above information to the physician. However, such records cannot be left with the physician.

ENCOURAGING INDIVIDUAL PARTICIPATION WHEN VISITING PHYSICIAN

Individuals will differ greatly in their ability to represent themselves when seeing a doctor. Some persons will need your help only to gather the necessary documents and will then be able to go to the physician and pharmacist by themselves. Others will need more assistance, and a few individuals will depend almost entirely on your help.

In all cases, encourage the individual to participate as much as possible. Don't "speak for the individual" unless it is necessary. Look at the following examples, for the "wrong" and "right" way to assist the individual.

1. Encourage the individual to provide his or her own description first and you fill in later.
2. Always allow the individual to answer first. If necessary, redirect the physician's questions to the individual.

3. Encourage the individual to ask all the questions he or she can remember. Then you ask the rest.
4. Have the physician give the individual the prescription then provide assistance, if necessary, to have it filled.

The main point is for your actions to provide an appropriate model for others. Many people will assume that the individual is totally dependent and has little to offer in this process. Your behavior can counteract this attitude and should serve to reinforce a positive image of the individual.

INFORMATION TO OBTAIN FROM THE PHYSICIAN AND/OR PHARMACIST

When a physician prescribes a new medication for an individual, you must be sure to get certain information. This information will be helpful for anyone who will be administering the medication.

In addition to the prescription, there are important questions you should have answered:

- a. What is the purpose and desired effect of the medication?
What is the diagnosis or condition for which the medication has been prescribed? What signs will tell you the medication is effective?
- b. What is the response time?
How much time should it take before the desired effects can be expected to occur?
- c. Are there any side effects that should be especially watched for?
Given the personal characteristics of a specific individual and/or the properties of a given medication, there may be certain potential side effects.
- d. Are there any possible interactions with other medications and/or foods?
Food and/or medication interactions are a major cause of side effects. The physician's knowledge of the individual's current medications and diet will allow him or her to predict whether interactions may occur.
- e. Are there any special administration or storage instructions?
Cover such areas as special storage instructions or diet restrictions while taking this medication. Also specific time(s) to take medication.

MEDICATION CONTAINER

The pharmacist will fill the prescription and transcribe the information from the prescription to the drug label. When you and the individual are given the container, read the label to make sure you understand the directions. The following medication label has been adapted from the previous prescription for Clara Barton (see below).

MEDICATION LABEL

PHONE
473-5480

Cozens Pharmacy
80 Delaware Avenue
Albany, NY 12208

Clara Barton 10/20/82
phenytoin 100 mg. #90
Take one (1) capsule three times a day

Rx 113 Dr. J. Dibble
Refills remaining 2 Expiration date 2/14/84

Dr. J. Dibble Substitution

It is important that you fully understand the directions on the label for this information must be transcribed to a medication administration record when you return to the residence.

NOTE: The physician signed the prescription on the line substitution permissible. Therefore, the pharmacist substituted phenytoin for the trade name Dilantin.

UNIT DOSE

Sometimes the medication you receive from the pharmacist will not be a traditional bottle type container. Unit dose packaging is an alternative that is being used more and more frequently.

A unit dose package system contains the ordered amount of medicine for a single unit dose, individually wrapped. Each individual dose will be labeled with the drug's brand and generic name, strength of dose contained, expiration date (if appropriate) and recommendations for special storing if necessary. The number of doses the doctor orders will be given to you in a container which is labeled with the prescription information. Tablets, capsules, and liquids can all be prepared in a single unit dose package.

The unit dose package system is very convenient but more expensive than the traditional method of packaging and more room is needed for storage.

OUT OF RESIDENCE MEDICATION ADMINISTRATION

In some instances, individuals will have medications ordered for times when they are out of the residence, such as attending a day program or visiting with family. When this occurs, special arrangements should be made to ensure the individual will continue to receive the medication.

Agency policies will vary as to arrangements. Some recommendations are:

- send the medication bottle as dispensed by the pharmacist with the individual and/or family, or
- at the time the medication is prescribed, request the prescribing physician to write a separate prescription for the period of absence, or
- bring the medication bottle to the pharmacy and ask the pharmacist to dispense the needed amount into another labeled container, or
- ask the pharmacist to fill a prescription by dividing it into two separate labeled containers when advance knowledge of the period of absence is known.

Answer Self Test Questions - The Medication Cycle-- C. Assisting in visit to Physician and Pharmacist

D. RECORDING AND STORAGE OF MEDICATIONS

THE FIFTH STEP IN THE MEDICATION CYCLE

Once you have obtained the necessary medication(s) from the pharmacist and have returned to your facility, you should record certain information on appropriate forms and store the medication properly. You will be using the information received from the physician and pharmacist to complete the documentation process.

Care and Storage of Medications

1. Medications must be safely locked in a storage container, i.e., lock box or medication cabinet, at all times except when the individual is taking the medications.
2. Drug supplies for each individuals must be stored under the proper conditions of sanitation, temperature, light, refrigeration and moisture.
 - a. Exposure to excessive heat over a period of time causes deterioration of some drugs.
 - b. Refrigeration is required for some drugs because they deteriorate if kept at room temperature. These drugs must also be locked in a storage container, for example a lock-box.
 - c. Exposure to light causes deterioration of some drugs. These must be kept in a dark bottle.
 - d. Bottles must always be capped when not in use to prevent deterioration of the medicine. Many drugs undergo chemical changes when exposed to air for a length of time.
3. Prescription drugs are to be obtained from a licensed pharmacy and are to be labeled with name, address, and telephone number of the pharmacy, the name of the individual, name and strength of the drug, directions for use, date filled, prescription number, the name of the physician or dentist, and the expiration date.
4. Non-prescription (over-the-counter= OTC) drugs and vitamins may be purchased and taken providing the following conditions are met:
 - a. the physician ordered the medication
 - b. the medication is maintained in original container.
 - c. the individual's name is taped to the container in such a manner as to not to obscure the original label.

5. Any drug container having detached, excessively soiled, or damaged labels must be returned to the pharmacy for re-labeling.
6. The contents of any drug container having no label or with an unreadable label must not be used. Follow your agency's procedure for disposing of medications.
7. Medications having specific expiration dates must not be used after the date of expiration.
8. Medication for external use must be kept in a separate area from those medications which are taken internally. These areas must be marked "External Medications".

Destruction of Medications

Medications must not be given after the expiration date on the container has passed. These must be disposed of according to your agency's procedures. Consult with your supervising nurse or pharmacist.

Answer Self Test Questions - Lesson 5: The Medication Cycle-- D. Recording and Storage of Medications

LESSON 5
INSTRUCTOR'S NOTE

RECOMMENDATIONS:

ONLY BLANK SELF TEST QUESTIONS ARE IN TRAINEE'S MANUAL

COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK
ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND
CORRECT ANSWERS GIVEN AT THAT TIME

INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 6: MEDICATION ADMINISTRATION

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Record the procedure to determine the "Six Rights".
2. State procedure to follow when one of the "Six Rights" do not agree.
3. Record your responsibilities for individuals who need assistance with medications.
4. Record your responsibilities for individuals who are unable to administer medication themselves.
5. State procedure to follow when administering rectal and vaginal suppositories
6. Describe five (5) ways a medication error may occur and your responsibilities.
7. Discuss situations when medications should not be given.

The final step in the medication cycle is Medication Administration.

■ The "Six Rights" of Medication Administration

1. Give the Right medication--compare the label on the medication container with the individual's medication sheet.
2. Give the Right dose--compare the order on the medication sheet with the label on the medication. If it is different, ask the staff nurse for further instructions.
3. Give medication to the Right Individual--compare the name on the medication sheet with the individual's Photo./ I.D. band (or other means of identifying individual).
4. Give medication by the Right route--compare the medication sheet and the label.
5. Give medication at the Right time--compare the medication sheet and the label. Always chart the exact time administered. If not administered within one hour prior to or after the prescribed time, you must chart the exact time you administered it.
6. Right documentation--record medication after it is given.

BEYOND THE 6 R's

Beyond the "Six Rights" of medication administration, there are some additional safeguards to follow that will help to minimize medication risks. These have been divided into three DO's and three DON'Ts.

DO give your full attention to the task.

DO remain with the individual until the medication has been taken.

DO prepare medication for only one individual at a time.

DON'T give a medication from a container which has a label that cannot be read.

DON'T give a medication from another person's container.

DON'T try to hide a medication error.

Before administering a medication, double check the medication record to be sure the medication is in the form ordered by the physician. If the medication record says capsules, be sure you have capsules and not tablets. The medication and record and pharmacy label should state the route (method) by which the drug should be administered. For instance, you might be instructed to **externally apply** an ointment to a rash. Follow the route directions carefully.

If you have **any** doubt as to whether the medication is the correct form as ordered, or can be administered as specified, call your supervisor before administering the medication.

For instance:

- If the medication in the container is in tablet form and the instructions say "apply externally," call your supervisor.
- If the individual has difficulty swallowing and the medication is in capsule form, call your supervisor.
- If the medication in the container is in a suppository form and the instructions say "take orally three times a day," call your supervisor.

GUIDELINES FOR INDIVIDUALS WHO NEED ASSISTANCE AND/OR SUPERVISION

For those individuals capable of self-administration of medication with assistance and/or supervision, the following procedure is recommended. Remember, that through this procedure efforts should be directed to encouraging and giving the individual every opportunity to do as much as possible.

PROCEDURE

1. Check medication record with drug label.
2. Assemble equipment: medication record, drinking glasses, straws, water, paper towels.
3. Have individual come to designated area.
4. Be sure individual washes hands before starting procedure.
5. If able, have individual select proper container from shelf. If not able to identify container, employee will.
6. Watch individual open container and remove correct dosage using proper equipment (medicine cup or container can to hand).
7. Remain with individual until medication is taken.
8. Record medication administration on proper documents.
9. Observe individual for reaction.

KEY POINTS

To ensure right individual, right medicine, right dose.

Equipment should be clean and dry.

Individual's room or area where medication is kept.

Clean technique.

"Rule of Three"--Read label three times:

1. Before removing container from medicine cabinet.
2. Before pouring drug dose.
3. Before returning container to the medicine cabinet.

Helpful for individual if non-childproof caps are used.

OR observe individual complete the recording.

PROCEDURE FOR ADMINISTRATION OF MEDICATIONS TO INDIVIDUALS WHO ARE NOT ABLE TO SELF-ADMINISTER

PROCEDURE

1. Check medication record with pharmacy label.
2. Assemble equipment, medication, record, drinking glasses, straws, water, paper towel.
3. Wash hands thoroughly before measuring or preparing medication.
4. Read medication record.

For each dose of medicine, read the label three times.

5. Pour the accurate dose.

KEY POINTS

To ensure right individual, right drug, right dose, right method, right time.

Work alone, prevent distractions or interruptions and have good lighting.

Maintain clean technique throughout procedure.

Minimize opportunity for error.

"Rule of Three" - Read the label:

1. Before removing container from medicine cabinet.
2. Before pouring the measured amount of drug.
3. Before replacing the container in the medicine cabinet.

LIQUIDS

- A. Shake liquids well. If solution has settled, shake until returned to suspension.
- B. Pour liquid medication from the bottle on the side opposite of the label.
- C. Hold medicine cup at every level with the thumbnail marking the desired dosage and read at lowest level of fluid surface.

To avoid soiling or defacing label, always place label against palm of hand and wipe outside of bottle before returning bottle to storage site.

PROCEDURE

- D. Pour liquid medication directly into calibrated cup.

TABLETS OR CAPSULES

- A. Pour correct number into cap of container.
- B. Empty cap into container such as a small paper cup.
- C. Place each dose of medicine in a separate container.

Administration of Poured Medications

- A. Identify individual and medication. Read the information on medication record.
- B. Explain the procedure to the individual.
- C. Individual should be in upright position.
- D. Check pulse, blood pressure, etc., if indicated.
- E. Check time.
- F. Check route (correct route).
- G. Hand medication and water to individual. If indicated, assist individual to take medication.
- H. Remain with individual until medication is taken.
- I. Observe individual for reaction.

KEY POINTS

Liquid may also be administered with teaspoons, but measurement is not as accurate.

Do not touch medication with fingers.

Avoid mixing medications unless so ordered or unless individual is used to taking more than one medication at a time.

Make sure you give the right medication to the right individual.

Ensures cooperation and helps in teaching the individual.

Facilitates swallowing.

Check to see if individual has swallowed medication.

Reaction may not occur until after drug is absorbed (one or two hours later).

CLEAN-UP:

- A. Discard used medicine cups in a waste container.
- B. Wash hands.

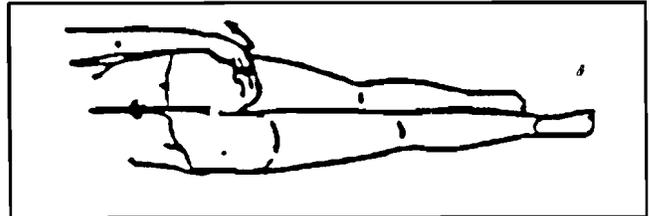
Washing hands between individuals is adequate to maintain clean technique.

Record medication administration on proper documents

The medication administration record can now be signed. Never sign the medication record until **after** the drug has been given.

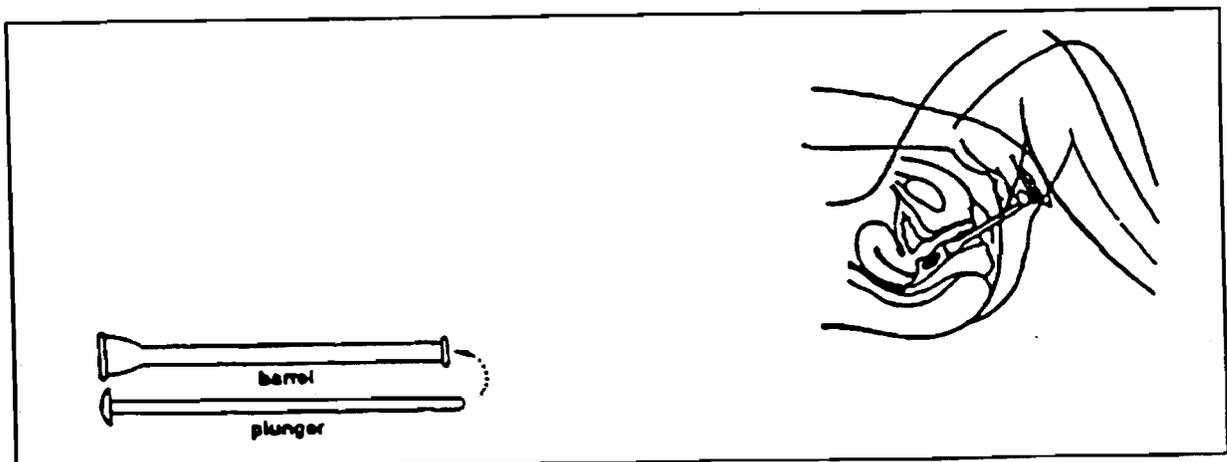
Procedure for the Administration of Rectal Suppositories

1. Wash hands.
2. Compare the order in the medication record to the label on the medication container.
3. Remove the outer wrap from the suppository.
4. Lubricate the pointed end of the suppository with a water base lubricant. Place the suppository on a tissue and avoid handling it as melting begins rapidly at body temperature.
5. Position the person on their left side in the privacy of their own room. Position the top leg up toward the abdomen.
6. Put on latex gloves.
7. Gently insert the lubricated tip of the suppository into the rectum the full length of your finger. The angle of insertion should be toward the umbilicus. Push the end of the suppository so that it touches the wall of the colon. It is not effective if inserted into the stool.
8. Remove gloves and dispose of them.
9. Wash hands.
10. Document on the medication record. Also, document any results from the suppository.



Procedure for the Administration of Vaginal Suppositories

1. Wash hands
2. Compare the order on the medication record to the label on the medication container.
3. Prepare the medication. Remove the wrap from suppository and/or load the applicator according to its instructions.
4. Have the individual go to her room and have her lie on her back.
5. Put on latex gloves.
6. Grasp the barrel of the applicator slightly downward, insert the applicator into the vagina as far as it will comfortably go. Now push the plunger with the index finger. Remove the applicator.
7. Instruct the individual to remain lying down for 15-30 minutes for absorption of the medication.
8. Separate the applicator, the barrel and the plunger. Wash as instructed on the package.
9. Remove gloves and dispose of them.
10. Wash hands.
11. Document on the medication record.



MEDICATION ADMINISTRATION RECORD (MAR)

The medication record is part of the individual's permanent record. It is an important record since it describes the medications used by the individual, the doses, the routes, and the times medications were taken.

Each agency will have a medication record which meets their specific needs. In general, a medication record will contain the following information:

1. The name of the agency or an identification code. (May also contain the address of the agency.)
2. The name of the individual taking the medication.
3. The month and the year the record is being kept for.
4. The name of the primary physician.
5. The names of the medications and how they are to be taken, as ordered by the physician.
6. The time the medications are to be taken.
7. Any drug sensitivities and allergies. If the individual has no allergies, then none noted or NKA (no known allergies) should be listed.
8. The initials of the CMA (Certified Medication Attendant) who assist or administers medication. The initials must be placed for each day and dose of medication given.
9. The signatures of all CMA (Certified Medication Attendant) who assisted/administered the meds.
10. The signature of the nurse who reviewed the record.

THE PRN MEDICATION RECORD

This section describes the procedures to be used in filling out the medication record or PRN or "as needed" medications. "As needed" medications are those medications prescribed by the individual's physician which are not taken on a set and specific schedule, but are to be taken when needed. Psychotropic drugs should not be given on an as needed basis.

Each time a PRN medication is taken, the name of the medication, the dosage, the date any time taken and the initials and or signature of the staff person are to be recorded on the PRN medication record. A copy of the PRN record can be found at the end of this section. PRN results must also be documented.

MEDICATION ERRORS

You have completed the study of the process of medication administration. However, at times no matter how strict we are in following procedures, an error can occur. The most important aspect to remember is, when an error occurs, immediately report and record the error.

A medication error occurs when any one or more of the "Six Rights" of medication administration is violated. For example:

- the wrong individual was given a medication
- the wrong medication was given to a individual
- the wrong dosage was given to a individual
- a medication was administered at the wrong time to a individual, or a medication was not given at all, and
- a medication was administered by the wrong route

If a medication error occurs, you should call your supervisor and/or other personnel as designated by the policy and procedures of your agency.

Most agencies require some form of documentation describing the error. When you report the error, both by phone and in writing, be sure to include the following information.

- WHO - the individual and staff member involved in the error
- WHAT - what type of error was made
- WHEN - when the error occurred

WHEN NOT TO GIVE MEDICATIONS

There may be occasions when it is the appropriate time to administer medications, BUT unusual circumstances require that you do NOT proceed. For example:

Discrepancy with Medication Label and/or Medication Record. If medication administration record is incomplete and/or the medication label is not readable, STOP. Contact your supervisor for further directions.

Individual Exhibits a Dramatic Change in Status. If the individual is showing signs of seizures, unconsciousness, difficulty in breathing, or other changes which appear to be health-threatening, do not administer the medication. Follow the instructions given for reporting an emergency or non-emergency health-threatening situation.

Wrong Individual, Medication, Time, Route. If you have any doubt that you have the right individual, right medication, right dosage, right time, or right route, get assistance from another staff member or call your supervisor before administering the medication.

Individual Refuses to Take Medication. Explain to the individual why it is important to take the medication as prescribed by the physician and encourage the individual to cooperate. If individual still refuses, do not force him or her to take the medication. Remember, the individual has the right to refuse medication. Call your supervisor and follow his or her instructions and document the situation.

QUESTIONS YOU SHOULD BE ASKING ARE:

"What physical and behavioral changes are occurring which may be a result of the medication(s)?", and last but not least, "Is the medication working?"

The process of administering medications is an on-going cycle of observation, recording, reporting, physician and pharmacy visits, documentation, storage of medication, and on and on. Each staff member, whether he/she administers medications or not, has responsibilities in this medication cycle.

The MAR Exercises

Note placement of each on the following sample MAR.

- A. The name of the agency or identification code.
- B. The name of the individual taking the medication and diagnosis.
- C. The month and the year the record is being kept for.
- D. The name of the primary physician.
- E. The name of the medication and how they are to be taken.
- F. The time the medications are to be taken
- G. Any drug sensitivity and allergies. If the individual has no allergies then NKA should be listed.
- H. The initials of the CMA.
- I. The signatures of all CMA's who assisted/administered medications.
- J. The signature of the nurse who reviewed the record.

Review the following on the **sample MAR** for the client John Smith.

Agency: XYZ
Client: John Smith
Physician: Dr. S. Needles

Medication Ordered: phenytoin 100mg tid po

Date: July 7, 1993 Note agency policy dictates times, XYZ Agency Policy states 8a, 12p, 8p as tid times.

Date: July 15, 1993 Physician changed phenytoin to 100mg bid po after morning dose.

Date: July 20, 1993 Physician added Litium 5mg bid po. Note XYZ agency policy states bid times as 8a and 8p.

Date: July 25, 1993 Physician discontinued phenytoin 100mg bid after morning dose.

Date: July 28, 1993 John Smith c/o headache and was given two tablets of Tylenol 325mg at 7pm. This order was obtained from the physician standing order list of PRN medications.
Note: Documentation of PRN results.

Date: July 29, 1993 Physician orders Benadryl 25mg po q6 hours PRN for itching.

MEDICATION ADMINISTRATION RECORD

AM UDA 5101-2A (Rev. 7-82)

F

MEDICATION	HOUR	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
Phenytoin 100mg by mouth 3x daily	8A																													
	12N																													
Lithium 5mg by mouth 2x daily	8A																													
	8P																													
Phenytoin 100mg by mouth 2x daily	8A																													
	8P																													
Divalproyl 25mg by mouth every 6 hrs for itching 7-29-93	P																													
	R																													
	N																													

MEDICATION	HOUR	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
------------	------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

NURSE'S ORDERS, MEDICATION NOTES, AND INSTRUCTIONS ON REVERSE SIDE.

STARTING FOR **July 1, 1993** THROUGH **July 31, 1993**

PHYSICIAN **Dr. S. Needles** TELEPHONE NO. **555-5555** MED. RECORD NO.

DI. PHY. ALT. TELEPHONE

RES **NKA** REHABILITATIVE POTENTIAL

DIAGNOSIS **B.M.R. / Bi-Polar Disorder**

DCAD NUMBER MEDICARE NUMBER **123456784** VA NUMBER

PATIENT **S. Smith, John** DATE OF BIRTH **8-15-73** PATIENT CODE

ROOM NO. **AGENCY 117** BED FACILITY

ENTRIES CHECKED
Patricia Hockley TITLE: **RN**

INITIAL APPROPRIATE BOX WHEN MEDICATION GIVEN

3 STATE REASON FOR REFUSAL OF MEDICATION

4 STATE REASON AND RESULT FOR PRN MEDICATIONS

5 INDICATE INJECTION SITE (CODE)

2	LEFT DORSAL GLUTEUS	6	LEFT LATERAL TH	10	LEFT UPPER ARM
3	RIGHT VENTRAL GLUTEUS	7	RIGHT DELTOID	11	RIGHT ANTERIOR TH
4	LEFT VENTRAL GLUTEUS	8	LEFT DELTOID	12	LEFT ANTERIOR TH

CIRCLE INITIALS WHEN MEDICATION REFUSED

Handwritten circled initials: (H) and (J)

NURSE'S SIGNATURE	INITIALS	NURSE'S SIGNATURE	INITIALS	NURSE'S SIGNATURE
<i>Sarah Lips, CMA</i>				
<i>Michelle Hill, CMA</i>				
<i>Angela Craig, CMA</i>				
<i>Kathleen Shelby, RN</i>				

NURSE'S MEDICATION NOTES

DATE	TIME GIVEN	MEDICATION & DOSAGE	CODE	REASON	RESULTS OR RESPONSE	TIME NOTED	NURSE'S SIGNATURE	TITLE
------	------------	---------------------	------	--------	---------------------	------------	-------------------	-------

1/7/13	8A	Plexyten 100mg		initials in wrong box			<i>SH</i>	
2/2/13	7p	Dyloval 925mg (IT)		for 40 headache	relieved	8pm	<i>AL</i>	

BACK OF MAR

Add the following medications to your **exercise MAR** on the following page:

Date: July 5, 1993 Erythromycin 250mg po tid x 7 days. Medication is received at 4 pm.

Date: July 8, 1993 Depokote 500mg po bid and 1000mg hs. You receive 500mg tablets at 2 pm.

Date: July 10, 1993 Mellaril 100mg po tid x 10 days then give Mellaril 100mg bid. You receive meds at 2 pm.

Date: July 10, 1993 At 8 pm client refuses medications.

Additional Information:

Sometimes a physician will eliminate the medication from the client's medication regimen. This would be a **DISCONTINUATION** order and the medication would be **REMOVED** from the **MAR**.

Other times the physician will want to change the amount of medication the client is receiving. In this case the order is referred to as a **CHANGE**. The client will still receive the medication. Only the dosage will be changed.

Note above situations on the **Sample MAR**.

LESSON 6
INSTRUCTOR'S NOTE

RECOMMENDATIONS:

ONLY BLANK SELF TEST QUESTIONS ARE IN TRAINEE'S MANUAL

COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND CORRECT ANSWERS GIVEN AT THAT TIME

INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 7: DOCUMENTATION

OBJECTIVES

At completion of this lesson, you will be expected to:

1. List the general rules of charting.
2. List the rules for charting medications.
3. Know what an individual stop order is.
4. Know what observations are important to chart.

The chart provides a medical profile of each individual and is admissible as evidence in court. It is very important that documentation be done accurately and immediately after the administration of any medication.

It is also important that when charting, all staff members chart in the same manner. This allows for accurate tracking of the individual's health since all staff members are consistent in what and how they chart.

A doctor's order is required before any member of the residential staff can administer a medication. The medication order must contain eight basic parts for it to be valid. It is the responsibility of the personnel administering medications to follow the written orders. However, you have the right and responsibility to question any medication order you are not comfortable following. When in doubt, contact your supervisor about this order.

I. Contents of the Chart -- (see agency policy)

II. General Rules of Charting

- A. Legibility is very important--write or print so the information you chart can be read easily by others.
- B. Use durable ink--the color will be determined by agency policy.
- C. Never erase or obliterate an entry--when you make a mistake, draw a single line through the incorrect words, write "error" or "void" above them, and initial the entry. Correction fluid is not allowed.

- D. Chart in time sequence--do not leave blank space or lines between entries.
- E. Be accurate and concise--be sure the date on your entry is correct and include the time if it is significant to the care of the individual.
- F. If you use medical terminology, be sure it is spelled correctly and accurately describes what you observe, and use only approved abbreviations.
- G. Chart what you see, hear, smell, or touch, not what you think or feel. Do not chart opinions. Do not make diagnoses.
- H. Chart the individual's response or lack of response to a medication.
- I. Sign your entry with your complete name or your first initial and last name. Use the method designated by your agency.

III. Rules for Charting Medications

- A. Chart as soon as possible after a medication is administered.
- B. Every medication given must be charted for the correct individual and include the following information:
 - 1. Name and dosage of medication
 - 2. Time of administration
 - 3. Route of administration
- C. Routine medications are usually charted by putting your initials in the appropriate box on the medication record, and by signing your complete name and title in the appropriate space on the medicine sheet.
- D. The effects of PRN medication must be charted after an appropriate period of time. For example, an hour or so after a pain medication is given, observe and chart the individual's level of pain. (See agency policy)
- E. Chart medication omission according to agency policy (for example: with an "O" in the appropriate square on the medication sheet with your initials inside the "O") and chart the reason for omission on the back of the medication sheet.
- F. Medications are charted after they are given NOT BEFORE.

IV. Administering Medications Appropriately Requires

- A. Knowledge of expected drug actions.
- B. Knowledge of possible adverse effects.
- C. Knowledge of agency policies and charting.
- D. Charting accurately and legibly.
- E. Spelling correctly.

REMEMBER: IF IT IS NOT CHARTED AND LEGIBLE, IT IS NOT CONSIDERED DONE!

V. Parts of an Order (Documentation by Physician)

- A. Individual's name
- B. Name of medication
- C. Route of administration
- D. Frequency of administration (may include time of day)
- E. Dosage
- F. Duration (for how long, number of doses)
- G. Doctor's signature
- H. Miscellaneous information (number of refills, take on an empty stomach, do not take with milk products, etc.)

VI. Individual Stop Orders

- A. A medication may be ordered for a specific time or number of doses and must be documented, such as:
 - 1. Achromycin 250 mg. q6h x 28 doses
 - 2. Septra Tab qd x 14 days
- B. Giving an extra dose and giving a dose at the wrong time are errors.

Answer Self Test Questions - Lesson 7: Documentation

LESSON 7

INSTRUCTOR'S NOTE

RECOMMENDATIONS:

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INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 8: INTRODUCTION TO USE OF MEDICATION REFERENCES

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. List 3 sources for obtaining additional information about prescription and over-the-counter drugs.
2. Know how to appropriately use additional sources.

Several sources are available for obtaining additional information about prescription and over-the-counter drugs. These references include:

1. Physician's Desk Reference
 2. Physician's Desk Reference for Non-prescription drugs
 3. Package Brochures
 4. Your formulary
- I. **PHYSICIAN'S DESK REFERENCE, ED 35.** ORADELL, NEW JERSEY: MEDICAL ECONOMICS CO., 1981.

PHYSICIAN'S DESK REFERENCE FOR NON-PRESCRIPTION DRUGS.
ORADELL, NEW JERSEY: MEDICAL ECONOMICS CO., 1981.

Text is designed to satisfy the need for medical information regarding the vast array of non-prescription, or OTC (over-the-counter) drugs. It is divided into six sections. Each section uses a different page color for easy access.

- a. Section 1 (white). Manufacturers' Index - an alphabetic listing of each manufacturer, their addresses, emergency phone numbers, and a partial list of available products.
- b. Section 2 (pink). Products are listed in alphabetical order by brand name.
- c. Section 3 (blue). Product Category Index - products are listed according to their therapeutic use such as analgesics to warts.
- d. Section 4 (yellow). Active Ingredients Index - products described in white section are listed generically according to principal ingredients.

- e. Section 5. Product identification - each manufacturer has provided color pictures of the product.
- f. Section 6. Product Information - lists the major products with information on action, uses, administration, dosages, contraindications and treatment of overdose. The PDR for non-prescription drugs is an excellent reference source. As one of the few references available for non-prescription drugs, it would prove invaluable to community residence staff.

II. PACKAGE BROCHURES

Before a new drug is marketed, the manufacturer develops a comprehensive but concise description of the drug, indications and precautions in clinical use, suggestions for dosage, known adverse actions, contraindications and other pharmacologic information relating to the drug. In addition, Federal Law requires that a brochure accompany each package of the product.

- The brochure must be approved by the Food and Drug Administration before the product is released for marketing.
- The brochure is used for drug description in the PDR.
- The pharmacist, upon request for information on a drug, may sometimes give you the package brochure.

III. FORMULARY

This is a list of drugs most commonly used in your agency. It is developed by the agency pharmacist. (See agency policy).

LESSON 8
INSTRUCTOR'S NOTE

RECOMMENDATIONS:

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COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK
ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND
CORRECT ANSWERS GIVEN AT THAT TIME

INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 9: MEDICATION CLASSIFICATIONS - OVERVIEW

OBJECTIVES

At the completion of this lesson you will be expected to:

1. Define classification
2. Give the action, use, adverse effects and special considerations for each drug classification.
3. Give two examples of each drug classification.

Classification is defined as a means to arrange or put in a class on the basis of resemblances or differences.

Medications are classified according to the therapeutic effect they have on a particular system of the body.

Overview/Medication Classifications

A. Gastrointestinal system

1. Antacids

- a. Action--neutralize acidity by chemical reaction
- b. Uses--treat indigestion, ulcers
- c. Examples
 - i. Gaviscon
 - ii. Maalox
 - iii. Riopan
 - iv. Mylanta
 - v. Di-Gel
 - vi. Gelusil
- d. Adverse effects--may cause mild constipation or diarrhea

2. Antidiarrheals

- a. Action--stops diarrhea
- b. Use--treat diarrhea
- c. Examples
 - i. Bismuth subsalicylate (Pepto-Bismol)
 - ii. Loperamide (Imodium)
 - iii. Kaolin/pectin mixtures (Kaopectate)
 - iv. Diphenoxylate HC1 (Lomotil)

- d. Adverse effects
 - i. Drowsiness
 - ii. Fatigue
 - iii. Rash
 - iv. Constipation and fecal impaction

3. Laxatives

- a. Saline laxative
 - i. Action--increase fluid in the intestine
 - ii. Use--promote bowel action
 - iii. Example
 - aa. Magnesium salts (Milk of Magnesia)
 - bb. Sodium biphosphate (Fleet Enema)
 - iv. Adverse effects
 - aa. Diarrhea
 - bb. Cramping
- b. Bulk laxative
 - i. Action--increase bulk in the stool
 - ii. Use--promote bowel action
 - iii. Examples
 - aa. Psyllium (Metamucil, Effersyllium)
 - bb. Methylcellulose (Cologel)
 - cc. Calcium polycarbophil (Mitrolan)
 - iv. Adverse effects
 - aa. Nausea and vomiting
 - bb. Diarrhea
 - cc. Laxative dependence
- c. Stool softeners
 - i. Action--soften fecal material
 - ii. Use--treat constipation
 - iii. Examples
 - aa. Docusate sodium (Colace, Doxinate)
 - bb. Sometimes combined with other drugs (Senokot-S, Doxidan, Dialose-Plus, Peri-Colace)
 - iv. Adverse effects
 - aa. Mild cramping
 - bb. Laxative dependency
 - v. Special considerations
 - aa. Give with milk or fruit juice
 - bb. Do not crush medication
- d. Lubricants
 - i. Action--make stool slippery
 - ii. Use--treat constipation

- iii. Examples
 - aa. Mineral Oil
 - bb. Haley's M.O.
 - cc. Glycerin suppository
- iv. Adverse effects
 - aa. Nausea
 - bb. Abdominal cramps
 - cc. Incontinence
- e. Stimulant laxatives
 - i. Action--stimulate bowel lining
 - ii. Use--increase peristalsis, bowel training
 - iii. Examples
 - aa. Bisacodyl (Dulcolax, Bisacodyl)
 - bb. Senna (Senokot)
 - cc. Dulcolax Suppository
 - iv. Adverse effects
 - aa. Diarrhea
 - bb. Cramping
 - v. Special consideration--tablet must be swallowed without chewing.

B. Musculoskeletal System

1. Steroid medications

- a. Action--decreases inflammation
- b. Uses--treat arthritis, dermatitis, chronic respiratory conditions
- c. Examples
 - i. Dexamethasone (Decadron)
 - ii. Prednisone (Deltasone, Meticorten)
 - iii. Methylprednisolone (Medrol)
 - iv. Hydrocortisone (Cortef)
 - v. Triamcinolone diacetate (Kenalog)
- d. Adverse effects
 - i. Weight gain from increased appetite and edema
 - ii. Mood swings
 - iii. Night sweats
 - iv. Increased blood sugar and electrolyte imbalance
 - v. Masks symptoms of infection
 - vi. Slows healing
 - vii. Elevates blood pressure
 - viii. Ulcers
 - ix. Muscle weakness
 - x. Hair loss
 - xi. Cushing Syndrome
 - xii. Prolonged bleeding and bruising

- e. Special considerations
 - i. Watch diabetic individuals for change in urine glucose or fasting blood sugar.
 - ii. Withdrawal symptoms occur if medication is stopped abruptly.

2. Nonsteroidal anti-inflammatory agents (NSAIA)

- a. Action--anti-inflammatory analgesic and antipyretic effects
- b. Uses--arthritis, bursitis, tendonitis, gout
- c. Examples
 - i. Indomethacin (Indocin)
 - ii. Sulindac (Clinoril)
 - iii. Fenoprofen calcium (Nalfon)
 - iv. Ibuprofen (Motrin)
 - v. Meclofenamate (Meclomen)
 - vi. Naproxen (Naprosyn)
 - vii. Aspirin (A.S.A., Bayer, Ecotrin)
- d. Adverse effects
 - i. Nausea and vomiting
 - ii. Headaches
 - iii. Gastrointestinal bleeding
 - iv. Dizziness
 - v. Heartburn
 - vi. Rashes
 - vii. Decreased appetite
 - viii. Prolonged bleeding and bruising
 - ix. Tinnitus
- e. Special consideration--observe individual for blood in the stool which may indicate gastrointestinal bleeding. Blood will initially appear as black, not red in color. Individual may vomit substance resembling "coffee grounds".

C. Skin System (Dermatomucosal medications)

- 1. Action--cleanse and medicate skin
- 2. Uses--treat blemishes, prevent new blemishes, prevent scarring
- 3. Examples
 - a. Topical
 - i. Benzoyl peroxide (Benoxyl, Oxy-5, Dry and Clear)
 - ii. Tretinoin (Retinoic acid)
 - iii. Antibiotic lotions
 - b. Systemic
 - i. Tetracycline
 - ii. Prednisone
 - iii. Ibuprofen

4. Adverse effects
 - a. Peeling skin
 - b. Allergic contact dermatitis
5. Special considerations for benzoyl peroxide
 - a. Many preparations are available without prescription.
 - b. Start with a 5% preparation, applying once a day in the morning.
 - c. This drug inactivates retinoic acid--do not use these 2 drugs at the same time.

D. Sensory system

1. Lubricants (eye medication)

- a. Action--soothe and lubricate dry eyes
- b. Use--treat decreased tear production
- c. Example--artificial tears (Tears Naturale, Liquifilm Tears)
- d. Adverse effect--localized irritation and burning sensation
- e. Special considerations
 - i. Use with caution in individuals with glaucoma.
 - ii. Do not touch any surface of the eye with the end of the dropper.
 - iii. Crust forming on the eyelids and eyelashes indicate an eye infection.

2. Ear medications

- a. Action--relieve pressure, reduce inflammation, reduce pain in the ear
- b. Use--external otitis, pain
- c. Examples
 - i. Benzocaine (Auralgan)
 - ii. Cortisporin Otic
- d. Adverse effects--irritation or itching
- e. Special consideration
 - i. Do not rinse dropper after use.
 - ii. Insert cotton into the ear canal after applying the drops and allowing the drops to drain into the inner ear. (Monitor cotton in ear and remove as needed).
 - iii. Many of these medications are used in combination with oral antibiotics, analgesics, and anti-inflammatories: watch for drug interactions.

E. Urinary system (Urinary antiseptics)

1. Action--prevent growth of disease-producing organisms in the urinary tract
2. Use--to treat urinary tract infections
3. Examples
 - a. Nalidixic acid (NegGram)
 - b. Nitrofurantoin (Furadantin)
 - c. Nitrofurantoin macrocrystals (Macrocrystin)

4. Adverse effects
 - a. Drowsiness
 - b. Headache
 - c. Nausea and vomiting
 - d. Dizziness
 - e. Skin rash
5. Special considerations
 - a. Individual should avoid exposure to sunlight.
 - b. May cause a false-positive Clinitest.
 - c. Individual should report vision problems.
 - d. Drink plenty of water (6-8 glasses per day).
 - e. Avoid cola and caffeine drinks.

F. Cardiovascular system (Antihypertensives)

1. Adrenergic blockers

- a. Action--decrease blood pressure with effect on the nervous system
- b. Use--treat hypertension
- c. Examples
 - i. Methyldopa (Aldomet)
 - ii. Clonidine HCl (Catapres)
 - iii. Atenolol (Tenormin)
 - iv. Captopril (Capoten)
- d. Adverse effects
 - i. Dizziness
 - ii. Weakness
 - iii. Nausea and vomiting
 - iv. Hypotension

2. Diuretics

- a. Action--decrease blood pressure and increase urinary output
- b. Uses--treat congestive heart failure, hypertension, severe edema
- c. Examples
 - i. Spironolactone (Aldactone)
 - ii. Chlorothiazide (Diuril, Hydro DIURUL)
 - iii. Methyclothiazide (Enduron)
 - iv. Furosemide (Lasix)
 - v. Aldactazide and Dyazide (combinations containing hydrochlorothiazide)
- d. Adverse effects
 - i. Dizziness
 - ii. Weakness
 - iii. Nausea and vomiting
 - iv. Hypotension
 - v. Tremors

G. Respiratory system--Antihistamines

1. Action--combat the effects of histamine, which is released by the body in an allergic reaction
2. Use--treat motion sickness and allergic reactions
3. Examples
 - a. Diphenhydramine (Benadryl)
 - b. Chlorpheniramine (Chlor-Trimeton, Teldrin)
 - c. Promethazine (Phenergan)
 - d. Trimeprazine (Temaril)
 - e. Terfenadine (Seldane)
 - f. Dimetapp Extentabs
4. Adverse effects
 - a. Drowsiness (most common)
 - b. Dizziness
 - c. Loss of appetite
 - d. Dry mouth
 - e. Urinary retention
5. Special considerations
 - a. Do not give with alcohol or other depressants.
 - b. Individuals can develop a tolerance to the medication.

H. Endocrine system (Oral contraceptives)

1. Action--inhibit ovulation
2. Use--regulation of menstrual cycle, prevent pregnancy
3. Example--estrogen with progesterone (Ovral, Norinyl, Ortho-Novum)
4. Adverse effects
 - a. Headache
 - b. Weight gain
 - c. Hypertension
 - d. Thrombophlebitis
 - e. Edema
 - f. Breast tenderness
 - g. Vaginitis
 - h. Nausea

I. Nervous system

1. **Stimulants (Caffeine)**
 - a. Action--increase mental and physical alertness and activity
 - b. Use--increase activity
 - c. Examples--coffee, caffeine drinks, some aspirin compounds

- d. Adverse effects
 - i. Nervousness
 - ii. Headache
 - iii. Insomnia
- e. Special considerations
 - i. Sudden discontinuation may cause headaches and irritability.
 - ii. Psychological dependence or tolerance may develop.

2. Depressants

a. Analgesics

- i. Action--decrease sensitivity of nervous system
- ii. Use--relieve pain
- iii. Examples
 - aa. Morphine sulfate (Duramorph, Epimorph)
 - bb. Codeine
 - cc. Meperidine HCl (Demerol)
 - dd. Oxycodone HCL (Tylox, Percocet, Percodan)
- iv. Adverse effects
 - aa. Constipation
 - bb. Nausea and vomiting
- v. Special considerations
 - aa. Addictive
 - bb. A bowel management system should be followed.

b. Non-narcotic analgesics

- i. Action--decrease sensitivity of nervous system
- ii. Use--relieve pain
- iii. Examples
 - aa. Propoxyphene (Darvon)
 - bb. Darvocet N-100
 - cc. Talacen
- iv. Adverse effects
 - aa. Dizziness
 - bb. Confusion
 - cc. Nausea

c. Analgesic-antipyretics

- i. Action--decrease sensitivity of nervous system
- ii. Use--relieve pain and normalize body temperature
- iii. Examples
 - aa. Acetylsalicylic acid (A.S.A.)
 - bb. Acetaminophen (Tylenol)

- iv. Adverse effects
 - aa. Bleeding
 - bb. Stomach distress
 - cc. Dizziness
 - dd. Tinnitus

3. Anti-Parkinson's medications

- a. Action--relieve symptoms of Parkinson's Disease
- b. Use--relieve tremors and muscular weakness, treat extrapyramidal effects of major psychotropics
- c. Examples
 - i. Benztropine mesylate (Cogentin)
 - ii. Trihexyphenidyl HCl (Artane)
 - iii. Levodopa (Larodopa, Dopar)
 - iv. Levodopa-carbidopa (Sinemet)
 - v. Amantadine HCl (Symmetrel)
- d. Adverse effects
 - i. Incoherence
 - ii. Hallucinations
 - iii. Nausea
 - iv. Heart irregularities
 - v. Constipation
 - vi. Muscle weakness
 - vii. Lethargy
- e. Special consideration--many of these drugs are given in combination with other drugs to achieve the best results.

J. Nutritional deficiencies (Vitamins)

- 1. Thiamine HCL (Vitamin B₁)
 - a. Action--necessary for carbohydrate metabolism
 - b. Uses--treat alcoholism, gastrointestinal disease, cirrhosis
 - c. Adverse effects
 - i. Hypotension
 - ii. Nausea
 - iii. Sweating
 - iv. Anaphylactic reaction
 - v. Diarrhea
 - vi. Restlessness
- 2. Pyridoxine HCl (Vitamin B₆)
 - a. Action--required for amino acid metabolism
 - b. Use--in combination with isoniazid (INH) therapy, which causes B₆ deficiency

- c. Adverse effects--drowsiness
 - d. Special consideration--do not give to a individual receiving Levodopa
3. Ascorbic Acid (Vitamin C)
- a. Action--necessary for collagen formation and tissue repair
 - b. Uses--burns, increase healing of fractures and wounds, may prevent viral infections
 - c. Adverse effects
 - i. Diarrhea
 - ii. Renal calculi
4. Folic Acid (Vitamin B₉)
- a. Action--necessary for normal erythropoiesis and nucleoprotein synthesis
 - b. Uses--treat liver disease, alcoholism
 - c. Adverse effects
 - i. Rash
 - ii. Malaise
 - iii. Bronchospasms as an allergic reaction
5. Niacinamide (Vitamin B₃, Nicotinic Acid)
- a. Action--necessary for fat metabolism
 - b. Uses--lowers cholesterol, treat Meniere's Disease, vasodilator
 - c. Adverse effects
 - i. Headache
 - ii. Facial flushing
 - iii. Itching
 - iv. Jaundice
 - v. Postural hypotension
 - d. Special consideration--give with meals and cold liquids.
6. Multivitamin products--contain a combination of vitamins and minerals
- a. Action--source of vitamins
 - b. Use--supplement diet
 - c. Examples
 - i. Becotin-T--contains several B vitamins and Vitamin C
 - ii. Multicebrin--contains Vitamins B, C, E, A, and D
 - iii. Theragram--contains Vitamins A, B complex, C, D, & E
 - d. Adverse effects
 - i. Itching
 - ii. Diarrhea
 - iii. Nausea
 - e. Special consideration--do not crush medication.

EXAMPLES OF DRUGS WITHIN CLASSIFICATIONS

Some drugs are in two or more classifications since they can be used for more than one condition.

ANALGESICS

Aspirin
APC Tablet
Darvon Compound 65
Talwin
Tylenol
Tylenol with Codeine

ANTACIDS

Gelusil
Maalox
Milk of Magnesia
Mylanta

ANTHELMINTICS

Antepar
Antiminth
Povan
Vermox

ANTIASTHMATICS AND BRONCHODILATORS

Brondechon
Bronkotabs and
Bronkolixir
Isuprel Compound Elixir
Marax
Organdin
Tedral

ANTIBIOTIC AND ANTIBACTERIALS

Ampicillin
Chloromycetin
Cleocin
Erythromycin
Garamycin
Keflex
Lincocin
Prostaphlin
Tegopen
Tetracycline
Vibramycin
Pen Vee K

ANTICONVULSANT

Dilantin
Eskabarb
Mysolite
Mebaral
Mesantoin
Valium
Zarontin

ANTIDEPRESSANTS

Aventyl
Elavil
Tofranil

ANTIDIABETIC AGENTS

DBI-TD
Diabinese
Tolinase

ANTIDIARRHEAL PREPARATIONS

Donnagel & Donnagel Pg
Kaopectate
Lomotil
Paregoric

ANTIHISTAMINES

Actifed
Benadryl
Chlor-Trimeton
Deconamine
Dimetapp
Dimetane
Dramamine
Drixoral
Naldecon
Novahistine
Ornade
Phenergan
Polaramine (emveera)

ANTIPYRETICS

Aspirin
APC Compound Tablets
Pyrilgin
Tylenol

DIURETICS

Diuril
Diamox
Hydrodiuril
Lasix
Dyazide

LAXATIVES

Dorbane
Dulcolax Tablets and Suppositories
Glycerine Suppositories
Peri Colace
Prune Juice
Senokot

OPHTHALMIC PREPARATIONS

Chloromycetin Ophthalmic Ointment and Solution
Cortisporin Ophthalmic Ointment and Solution
Garamycin Ophthalmic Ointment and Solution
Neo Decadron Ophthalmic Ointment and Solution
Visine Eye Drops

OTIC PREPARATIONS

Auralgan Otic Drops
Colymicin Otic Drops
Cortisporin Otic Drops
Debrox Otic Drops

STIMULANTS

Adrenalin
Dexedrine
Ritalin

TRANQUILIZERS AND SEDATIVES

Atarax
Equanil
Eskabarb
Haldol
Librium
Mellaril
Phenobarbital
Seconal
Stelazine
Thorazine
Valium
Vistaril

Answer Self Test Questions -- Lesson 9:
Medication Classification Overview

LESSON 9

INSTRUCTOR'S NOTE

RECOMMENDATIONS:

ONLY BLANK SELF TEST QUESTIONS ARE IN TRAINEE'S MANUAL

COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND CORRECT ANSWERS GIVEN AT THAT TIME

INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 10: MEDICATION CLASSIFICATIONS

SECTION 1. VITAMINS AND MINERALS

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Recognize the role diet plays in supplying vitamins and minerals.
2. List four (4) situations when supplemental vitamins and minerals may be required.
3. State your responsibility when administering vitamins and minerals.
4. Define Hematinic medications.
5. List two (2) side effects of Hematinics.
6. Describe two (2) ways to reduce side effects of Hematinics.

VITAMINS AND MINERALS

Vitamins are substances that regulate body processes. You probably know them by their letter names: A, B-complex, C, D, E, and K. Vitamins help to build strong teeth and bones, promote growth, aid normal body functioning, and strengthen resistance to disease.

Minerals help build tissues, especially bones and teeth. They also regulate body fluids, such as blood and digestive juices. The minerals we need in our daily diet include calcium, phosphorus, sodium, potassium, iodine, iron and fluoride.

Vitamins and minerals are present in a wide variety of foods. A balanced diet usually provides enough vitamins and minerals and it is not necessary to take additional vitamins. However, there are some periods when it is necessary to take additional vitamins and minerals, such as during times of:

- Poor Nutrition
- Illness
- Pregnancy
- Periods of Growth

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING VITAMINS AND MINERALS:

The best situation is to encourage individuals to eat a nutritionally sound diet. However, if a physician orders vitamins and minerals for an individual, your major responsibilities are:

- FOLLOW LABEL DIRECTIONS.

- STORE VITAMINS IN A COOL, DARK PLACE.
- FOLLOW DOSAGES EXACTLY AS ORDERED. OVERDOSAGE CAN CAUSE TOXICITY.

HEMATINICS

Iron is a mineral which is very important in the formation of hemoglobin. Of all the minerals, supplemental iron will probably be the one required most. Iron preparations fall into the medication classification **HEMATINICS**.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING HEMATINICS:

As with most medications, Hematinics have some common side effects which include:

- ABDOMINAL CRAMPING, AND
- CONSTIPATION

These side effects can be reduced if Hematinics are given right after meals and the individual is encouraged to drink a minimum of six glasses of fluids per day.

Hematinics will cause the stools to turn a tarry black color. This is harmless, but it is important to tell the individual that this will occur. In addition, liquid iron preparations should be given through a straw, as they can stain the teeth.

Answer Self Test Questions - Lesson 10: Section 1, Vitamins and Minerals

**LESSON 10
SECTION 1**

INSTRUCTOR'S NOTE

SEE SUPPLEMENT #2 FOR ADDITIONAL INFORMATION ON VITAMINS,
MINERALS AND NUTRITIONAL DEFICIENCIES.

RECOMMENDATIONS:

DISCUSS WITH CLASS THE IMPORTANCE OF PROPER DIET. IT IS ESSENTIAL
THAT THE MENUS PREPARED BY THE DIETITIAN BE UTILIZED AS WRITTEN.

IF THERE ARE ANY QUESTIONS REGARDING DIET SUBSTITUTIONS, THE
DIETITIAN SHOULD BE CONTACTED.

ONLY BLANK SELF TEST QUESTIONS ARE IN TRAINEE'S MANUAL

COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK
ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND
CORRECT ANSWERS GIVEN AT THAT TIME

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LESSON 10: MEDICATION CLASSIFICATIONS

SECTION 2.

MEDICATIONS THAT AFFECT THE RESPIRATORY SYSTEM

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Define the classifications of medications which affect the respiratory system.
2. Given a specific medication classification, state at least two (2) side effects.
3. State responsibilities, other than observation, for side effects when administering medications in these classifications.
4. Discuss allergic response in terms of its development and symptoms.
5. Define anaphylactic shock and list four symptoms.
6. State the emergency medication used in anaphylactic shock.

The medication classifications which will be discussed in this section are:

- **ANTIHISTAMINES** - Medications that reduce the effects of histamine, relieving allergy symptoms. May also be used to prevent motion sickness.
- **EXPECTORANTS** - Medications that break up mucous, and facilitate its expulsion from the lungs.
- **ANTITUBERCULARS** - Medications that are used to treat tuberculosis.
- **ANTITUSSIVES** - Suppresses cough reflex.

IMMUNITY AND ALLERGIC RESPONSE - An allergic response may occur when a person comes in contact with a substance not normally present in the body, such as bacteria, pollen and medications. These substances are called antigens. Development of immunity depends on the body's ability to identify antigens, then produce antibodies to protect itself. You may develop immunity in different ways:

1. Natural Immunity - you are borne with the immunity
2. Acquired Immunity - you become immune after having a disease or being given a vaccine.

ALLERGIC RESULTS

When a person who has a tendency to become allergic first comes into contact with a specific antigen, antibodies are formed. When he comes in contact with this antigen again, an antigen-antibody reaction occurs. This results in the release of

histamine. It is histamine that causes the typical symptoms of an allergic response.

- Red, Watery Eyes
- Sneezing
- Runny Nose
- Rash-Hives

With the exception of a skin rash and hives, these symptoms are the same as those of a common cold. However, another more extreme reaction called anaphylactic shock may occur. This is a life threatening, rapidly occurring allergic reaction.

In addition to allergic symptoms, the person will become short of breath due to swelling in the throat and will become apprehensive. If at this point there is no treatment, the allergic response becomes stronger and the symptoms will progress to:

- Neck & Facial Swelling
- Restlessness & Agitation
- Weak, Fast Pulse
- Low Blood Pressure

These symptoms require emergency treatment. The most common medication used is Epinephrine (Adrenaline), a very strong bronchodilator which is given by injection (see table on bronchodilators for more information).

Medications are the most frequent causes of anaphylactic shock. However, you may also have heard of people dying after being stung by a bee. This is a good example of anaphylactic shock. What has happened is that the person is highly allergic to the bee venom.

People have also been known to develop serious reactions following ingestion of foods and/or medications.

Since people with a history of allergies are more likely to develop anaphylactic shock, it is imperative that any person with a past history of allergies be watched closely when receiving new medication.

ANTIHISTAMINES

The antihistamine medications act as ANTAGONISTS to prevent or reduce the symptoms of an allergy. They exert their greatest beneficial effect in nasal allergies. The antihistamines do not prevent or effectively relieve asthma. Problems usually relieved by antihistamines are:

- Common Colds
- Hives
- Insect Bites

- Medication Reactions
- Nasal Allergies

Some antihistamines are effective in preventing or relieving motion sickness. Many antihistamines are available in oral, topical or inhalant preparations.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTIHISTAMINES:

Antihistamines potentiate (strengthen) the actions of central nervous system (C.N.S.) depressants. Therefore, when a individual is taking an antidepressant, central nervous system depressants should be avoided. Some common C.N.S. depressants to avoid are alcohol, sedatives, and tranquilizers. The most common side effects are:

- Drowsiness
- Dry Mouth

Sucking hard candy or chewing gum will help prevent mouth dryness.

Table 2.1 lists some specific antihistamines and side effects.

Table 2.1
Antihistamines Medications

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
diphenhydramine (hydrochloride)	Benadryl	Tablet & Liquid	Relieve symptoms of allergic reaction and motion sickness	Drowsiness, dry mouth, dizziness, nasal stuffiness, blurred vision	Use with caution if used with central nervous system depressants	Warn client against drinking alcohol, driving, and other activities which require alertness.
*chlorpiramine	Chlor-Trimeton	.				
promethazine	Phenergan	.				
*dimenhydrinate	Dramamine	.				
meclizine	Bonine	.				
	Antivert	.				

* Non-Prescription Medication

EXPECTORANTS AND ANTITUSSIVES

Expectorants are medications that affect the mucous membrane lining of the respiratory tract and facilitate the expulsion of the mucous (sputum). Some expectorants and antitussives contain codeine and morphine derivatives to depress the cough reflex. These medications are not given to individuals with tuberculosis, however, because coughing is desired to expel the sputum.

Antitussives are preparations that depress the cough reflex. Expectorants and antitussives are often combined and referred to as cough preparations.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING EXPECTORANTS AND ANTITUSSIVES:

Many of these cough preparations contain sugar and alcohol. Alcohol could produce a medication interaction and the sugar content may be a problem if the individual is a diabetic.

In general, side effects that may occur are:

- Drowsiness
- Nausea
- Vomiting

Also, it is best to advise the individual not to drink or eat anything for at least a half hour after taking these preparations and to administer cough preparations after other medications which may be ordered at the same time. Now review the following table for specific medications (Table 2.2)

Table 2.2

Expectorants & Antitussive Medications

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
guaifenesin	Robtussin AC (with Codeine)	Liquid	Liquefies secretions and relieves cough.	Nausea, vomiting, drowsiness.	Many cause preparations contain sugar. Always use caution when giving to a diabetic.	Use with caution in head injury, seizures, alcoholism.
diphenhydramine	Benylin	.			Hold food/fluid for one half hour after administering.	

BRONCHODILATORS

Asthma is a disease marked by recurrent spasms of difficult labored breathing with sneezing, coughing and a sense of chest tightening due to constriction of the bronchial tree. In many cases, this condition is an allergic reaction produced as a result of an antigen-antibody reaction. Bronchodilators relax the constriction of the bronchial tree.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING BRONCHODILATORS-- Some side effects that may occur when taking bronchodilators are:

- Nervousness
- Vomiting
- Headache
- Restlessness
- Sweating
- Nausea

Table 2.3 will provide you with additional information on bronchodilators.

Table 2.3

Bronchodilator Medications

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
epinephrine	Adrenaline	Injection, Inhalation, Liquid	Asthma, Emphysema Allergic Responses; as in hay fever.	Nervousness, Nausea, vomiting, headache, flushed face, increase pulse, increased voiding, dizziness	Tricyclic anti-depressants potentiate the actions of Bronchodilator.	Use with caution in diabetics these medications may increase blood sugar.
theophylline	Aminophylline	Rectal Suppository	Chronic Bronchitis, Emphysema	.		Aminophylline is a CNS stimulant and is widely used for many conditions. It has different classifications. Reassure individuals who are upset by the "pounding" in the chest.
isoproterenol	Isuprel, Isonorin, Medihaler	Inhalation		Palpitation, sweating, flushing		

ANTITUBERCULAR

The last classification of medications to be discussed in relation to the respiratory system is the anti tubercular medications that are used to treat tuberculosis.

Tuberculosis (TB) is a chronic infection most commonly associated with the lungs. In this country, TB is less common than it used to be. However, due to increased immigration in the last ten years, it has become more common and individuals who have TB require long term treatment.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTITUBERCULARS--Side effects which may occur are:

- Nausea
- Fever
- Vomiting
- Rash

These medications should be given after meals which helps reduce the nausea and vomiting that may occur. See Table 2.4 for antitubercular medications.

Table 2.4

Antitubercular Agents

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
para-amino salicylic acid	PAS	tablet	Tuberculosis	Nausea, vomiting, fever, skin rash	Give after meals to reduce gastric upset.	Supplements of vitamin B ₆ are often used.
isoniazid	INH			In addition to above some numbness in hands and feet		INH is destroyed by light.

NOTE: The antibiotic streptomycin may be given in conjunction with PAS and INH.

Answer Self Test Questions - Lesson 10: Section 2 --Medications That Affect Respiratory System

**LESSON 10
SECTION 2**

INSTRUCTOR'S NOTE

SEE SUPPLEMENT #3 FOR STRUCTURES AND DISORDERS OF THE
RESPIRATORY SYSTEM

EACH OF THE SECTIONS PERTAINING TO MEDICATIONS THAT AFFECT THE
VARIOUS BODY SYSTEMS SHOULD BE PRECEDED BY A BRIEF OVERVIEW OF
THE ANATOMY AND PHYSIOLOGY OF THE SYSTEM

RECOMMENDATIONS:

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COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK
ASSIGNMENT

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LESSON 10: MEDICATION CLASSIFICATIONS
SECTION 3. GENERAL AND LOCAL ANTI-INFECTIVES
OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Define the classification of medications used as anti-infectives.
2. Given a specific medication classification, list at least three (3) side effects.
3. State responsibilities, other than observation for side effects, when administering medications in these classifications.
4. Describe the difference between broad and narrow spectrum antibiotics.
5. Describe how to determine if a individual has a history of allergies.
6. List foods/liquids which should be avoided by a person taking antibiotics.

The medication classifications which will be discussed in this Section are:

- **ANTIBIOTICS** - Medications that are used to destroy or control bacteria.
- **ANTIFUNGALS** - Medications that are used to treat fungus infections.
- **AMEBICIDES** - Medications that destroy protozoa.
- **TRICHOMONACIDES** - Medications that destroy trichomona.
- **ANTHELMINTICS** - Medications that are used to rid the body of worms.

INTRODUCTION:

Infection may be local and visible, such as an infected finger nail. The signs would include redness, swelling and pain around the finger nail. Infection may also be general or systemic, involving more than one area in the body, such as pneumonia. Signs of a general infection may include elevated temperature, cough, "rundown" feeling, poor appetite, and shortness of breath.

When individuals demonstrate any signs or symptoms of an infection, they should be seen by a physician. The physician may order antibiotics, medications that destroy or control bacteria.

ANTIBIOTIC MEDICATIONS

There are literally thousands of types of bacteria; therefore, it is necessary to have many different antibiotic medications.

It is important to know that some antibiotics are bacterial specific and the bacteria should be identified before an antibiotic is prescribed. The procedure for bacterial

identification involves obtaining a specimen from the infected area (throat, urine, mucous from lungs) and sending the specimen for laboratory analysis. The laboratory technician will determine whether the bacteria is gram positive or gram negative because each type produces different infections which respond to different antibiotics.

Each antibiotic has its own characteristic range (spectrum) of activity against various bacteria. Antibiotics that are effective for both gram positive and gram negative bacteria have a broad range of activity and are called:

- Broad Spectrum Antibiotics
- Control Gram Positive, and
- Gram Negative Bacteria

Broad spectrum, narrow spectrum, gram positive and gram negative are ways of defining the usefulness of a specific antibiotic.

In an ideal situation, when a person has signs of an infection, the physician orders a specimen sent to the laboratory and waits for the results before ordering a specific antibiotic. However, this often presents problems because a report may take several days to be done. Therefore, when a person is seriously ill, the physician may immediately start the individual on a broad spectrum antibiotic. When the lab report comes back, it may be necessary for the doctor to order a different antibiotic or the initial antibiotic may still be the medication of choice.

Toxic Reactions are Rare, But Usually are Serious When They Occur--Signs of toxic reactions that may be observed are:

- Decreased Urinary Output
- Change in Skin Color
- Lack of Energy
- Hearing Impairment

ADMINISTRATION AND CARE OF ANTIBIOTICS

Before administration of an antibiotic, you must determine if the individual has ever had an allergic reaction to an antibiotic. Ask the individual:

- Have you ever taken antibiotics?
- After taking pills, have you ever had an itching or rash?

If there is any indication that the individual has ever had an allergic reaction, you should seek guidance.

The general care and storage of antibiotics are very important. All antibiotics break down with age, heat and moisture. Their effectiveness can change if improper storage occurs. Always read the label for storage directions, such as:

- "Refrigerate" or "Store In a Dry, Cool Area"
- Antibiotics always have an expiration date:
 - Check Expiration Date, and
 - Never Use After That Date

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTIBIOTICS:

The discovery of antibiotics was a great breakthrough for medicine and the medications were often referred to as "miracle medications." However, there are some cautions for prescribing and administering antibiotics.

Antibiotics should be restricted to use in serious infections only. They should never be given for minor infections because with frequency or prolonged use the body tends to become resistant to the antibiotic activity and, in the event of a serious infection, antibiotics may not be as effective.

Major cautions to be aware of in connection with antibiotics are as follows:

ALLERGIC REACTION

Allergic reaction (as discussed in Section 2) is any abnormal response or reaction to a foreign substance. An antibiotic is a foreign substance to the body. An allergic reaction can occur immediately after the person takes the antibiotic or after the person has been on the medication for several days.

The allergic response may range from mild to life-threatening, such as an inability to breathe and low blood pressure that can lead to circulatory collapse and coma. This is called anaphylactic shock and is a life or death emergency. The key word is shock and the immediate treatment is according to first aid principles.

TOXIC REACTIONS

Another important reason why antibiotics are prescribed with caution is toxic reactions. Toxic means poisonous or dangerous, which means certain antibiotics can be very dangerous to some organs in the body. In general, antibiotics produce few toxic effects, but because the toxic effects can be life-threatening or leave permanent damage, it is important to be aware that a toxic reaction can occur.

In general, when a person begins to take antibiotics, he/she feels better and symptoms begin to subside. However, this does not mean the person is cured. The

entire prescription should be given unless the doctor orders it is to be stopped. In summary, your responsibilities when administering antibiotics include:

- Observe for toxic reactions, allergic reactions and other infections.
- Inquire for history of allergies.
- Read label for storage directions and expiration date.
- Give antibiotics on time.
- Use entire prescription unless orders are changed.

As you recall from previous content, there are many varieties of bacteria that cause infection. Consequently, different infections require different antibiotics. Table 3.1 will describe the penicillins.

Table 3.1

Penicillins

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
ampicillin	Amcill, Omnipen, Polycillin	Capsules, Liquid	Broad Spectrum	Gastric Upset, nausea, vomiting	Some foods lower effectiveness. AVOID caffeine, tomatoes, fruit juices, cola drinks, pickles	Give at least two hours after or one hour before a meal.
oxacillin	Bactocill	Capsules				
penicillin G, potassium G	PZerpen K-Cillin-500 Penlids	Tablets & Injections				
penicillin V, potassium	V-Cillin K Veeids Pen-Vee-K	Tablets & Liquid				

ERYTHROMYCINS

These medications work against many gram-positive infections. Because they kill many of the same germs as penicillin, erythromycins are a good substitute to use for people with penicillin allergies. Allergic reactions to erythromycins are rare, and side effects are limited to nausea and vomiting. Examples of trade name preparations of erythromycins are Illosone, Erythrocin, E-mycin and E.E.S.

CEPHALOSPORINS

This group of antibiotics are similar to the penicillins. They are broad-spectrum medications used mainly for penicillins in cases of allergy or resistance and in the treatment of certain gram negative infections. The cephalosporins should be given at least one hour before or two hours after eating (Table 3.2)

**Table 3.2
Cephalosporins**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
cephalexin	Keflex	Tablets & Liquids	Respiratory & Urinary Tract Infections	Nausea, vomiting, headache, diarrhea, genital & anal itching.		Use cautiously in those with history of sensitivity to penicillin. Tell patient to take with food or milk to lessen GI discomfort.
cefuroxime	Ceftin	Tablets & Injection				

MISCELLANEOUS ANTI-INFECTIVES

Antibiotics are not useful for all types of infections. There are some miscellaneous anti-infective agents developed to treat other specific infections.

ANTIFUNGAL

Antifungal agents are used to treat infections of the hair, skin, nails, mouth and vagina. These medications produce a selected spectrum of activity and only affect certain fungi. Review Table 3.3 to determine side effects and your responsibilities when administering these agents.

**Table 3.3
Antifungal Agents**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
amphotericin B	Fungizone	Lotion & Injection	Broad spectrum for fungi in the gastro-intestinal system.	Headache, Anorexia, diarrhea & burning at site of injection	Rare	
nystatin	Mycostatin	Liquid & Vaginal suppository	Mouth wash for thrush, & suppository for vaginal infections	Large oral dose may cause nausea & vomiting.		Oral solution-Individual swishes in mouth & swallows. Teach individual to insert vaginal suppository.

AMEBICIDES AND TRICHOMONACIDES

Amoeba are micro-organisms which are responsible for producing dysentery in humans. This infection gains access to the body through contaminated food and water. Dysentery is generally found in areas with low standards of hygiene. However, it may also be found in areas where there is overcrowding. Signs of dysentery will vary from mild to severe diarrhea, poor appetite, dehydration and fatigue.

Amebicides act to destroy amoeba type infections. Side effects may include: Nausea, Vomiting, Diarrhea.

Amebicides: Observe individuals on these medications closely. Encourage good hygiene.

TRICHOMONAS is a disease that is frequently transmitted through sexual intercourse. The signs and symptoms are more evident in the female and are a vaginal itch, burning and discharge. In the male, the only sign is a penile discharge. Treatment is the same for both sexes. Oral tablets may be ordered and/or suppositories to be inserted in the genital areas. Vaginal douches may be ordered for females.

Trichomonacides act to destroy trichomonal infections. Side effects may include: Nausea, Headache, Diarrhea, Vaginal and Urethral Burning. **Responsibilities when administering these medications include:**

- Instructing individuals in douching.
- Teaching methods of vaginal suppository insertion.
- Encouraging individuals not to have sexual intercourse until infection is cleared.

Table 3.4 lists some common amebicides and trichomonacides.

Table 3.4
Amebicides and Trichomonacides

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
metronidazole	Flagyl	Tablets & Vaginal Suppository	Protozoal Infection, Trichomoniasis	Nausea, Vomiting & topical skin irritations	Rare	Give tablet with food or milk.

ANTIPARASITIC DRUGS

Parasitic skin infections can be quite common in any environment. This is especially true in areas where many people live closely together. Parasitic skin infections include the following: Scabies, Body Lice (Pediculosis Corporis), Head Lice (Pediculosis Capitis), and Pubic Lice.

Kwell (Gamma Benzene Hexachloride) is a topical medication used for the treatment of both scabies and lice. Topical means that the medication is used only on the outside of the skin. Kwell should not be used on open skin areas because it can further irritate the skin. Kwell (Gamma Benzene Hexachloride) is available as:

- Lotion
- Cream
- Shampoo

SCABIES

Scabies produce tiny red spots between the fingers, in the arm pits, on the genitalia and abdomen. Severe itching accompanies the red spots. The skin above the neckline is rarely affected because the parasite grows in warm, moist areas.

Directions for scabies or pubic lice:

- Bathe entire body with soap and water.
- Apply lotion/cream to entire body from neck to toes.
- Wait 24 hours, then wash off medication (bathe individual).

LICE

Head lice are usually demonstrated by the presence of small, white dots called nits (eggs) in the hair. Pediculosis of the body and pubis is accompanied by itching. Signs of infestation may be: individual scratching, sore skin from scratching, and presence of eggs (nits).

Directions for head lice:

- Shampoo with Kwell.
- Work in lather for 4-5 minutes.
- Rinse hair and dry.
- Comb hair with fine tooth comb to remove nits.

If a major skin irritation rash develops, discontinue treatment and report it. If by accident the Kwell comes in contact with the individual's eyes, wash eyes with water and report to physician.

CAUTIONS: If one individual has an infection, all individuals in close contact should be examined. All clothing and bedding should be machine washed or dry cleaned. Your agency may have a procedure for infestation. If so, follow the agency's direction.

ANTHELMINTICS

Parasitic worm infections are a major cause of disease throughout the world. However, in the United States the most frequently encountered parasitic infections are limited to pinworm, roundworm and tapeworm. These parasites gain access to the gastrointestinal tract when food or soil has been contaminated with worm eggs and is ingested. Symptoms of infection may be: diarrhea, nausea, loss of appetite and abdominal cramps.

If the individual is heavily infected, you may see worm in the stools. Anthelmintics are medications which destroy worm infections.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTHELMINTICS:

When a individual is taking anthelmintics, the following side effects may occur:

- Nausea
- Fever
- Headache
- Diarrhea

Usually laxatives are also administered to increase intestinal activity and facilitate bowel movements so that worms and eggs are excreted into the stools. (See Table 3.5).

Table 3.5
Anthelmintics

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
tetrachloroethylene	same	Gelatin capsule	Hookworm	Nausea, Vomiting, Cramps, Diarrhea	Stomach upset can be reduced if given when the stomach is empty.	Remind client not to chew Gelatin Capsule as they have a very bitter taste.
thiabendazole	Mintezol	Tablet & Liquid	Hookworm, pinworms	Above symptoms plus confusion and drowsiness.		
hexylresorcinol	same	Tablet	All types of worms	Nausea, Vomiting, Cramps, Diarrhea		

Answer Self Test Questions - Lesson 10: Section 3 --General and Local Anti-Infectives

**LESSON 10
SECTION 3**

INSTRUCTOR'S NOTE

SEE SUPPLEMENT #4 INFLAMMATION, INFECTION AND IMMUNITY.

RECOMMENDATIONS:

ONLY BLANK SELF TEST QUESTIONS ARE IN TRAINEE'S MANUAL

COMPLETION OF THE SELF TEST SHOULD BE GIVEN AS A HOMEWORK
ASSIGNMENT

THE TEST WILL BE REVIEWED AT THE BEGINNING OF THE NEXT CLASS AND
CORRECT ANSWERS GIVEN AT THAT TIME

INSERT SELF TEST ANSWERS FOR CLASS REVIEW
THE ANSWERS ARE FOUND AT THE END OF THE INSTRUCTOR'S MANUAL

LESSON 10: MEDICATION CLASSIFICATIONS

SECTION 4. MEDICATIONS THAT AFFECT THE CARDIOVASCULAR SYSTEM

OBJECTIVES

At the completion of this lesson, you will be expected to:

1. Define the classifications of medications which affect the cardiovascular system.
2. Given a specific medication classification, list at least three (3) side effects.
3. State responsibilities, other than observations for side effects, when administering medications in these classifications.
4. List three (3) signs that may indicate lack of potassium.
5. Describe the relationship between salt and hypertension.

The medication classifications which will be discussed in this Section are:

- **DIGITALIS PREPARATIONS** - Medications which slow and strengthen the heart beat.
- **ANTIARRHYTHMICS** - Medications used to correct disorders of the heart rate and rhythm.
- **VASODILATORS** - Medications used to increase the size of blood vessels.
- **DIURETICS** - Medications used to increase urinary output.
- **ANTIHYPERTENSIVES** - Medications used to lower blood pressure.
- **ANTICOAGULANTS** - Medications which decrease clot formation.
- **COAGULANTS** - Medications which increase clot formation.

RELATED INFORMATION

The cardiovascular system may be thought of as a transportation system. It takes nourishment and oxygen to the cells and carries away waste products.

The system is kept in motion by the force of the heartbeat. Disease which attacks any part of this system interferes with the overall function.

CARDIAC CYCLE

The cardiac cycle is what determines the pulse rate. Each time the heart beats, a pulsation may be felt in an artery. This pulsation is referred to as the pulse. Normal pulse rate will vary with the size, age, activity, and sex of the person. Average rate for adults is 70-90 beats per minute.

When medications are given for cardiovascular disorders, it may be required that the individual's pulse and/or blood pressure is taken before the medication is given. The reason is that most of these medications in some way will affect the pulse and/or blood pressure.

PULSE

With each beat of the heart, blood is forced into blood vessels called arteries, causing an expansion of vessel walls. This can be felt by the fingers in certain places where the arteries lie close to the surface of the body. This expansion is called the pulse.

The number of beats per minute is the pulse rate. The spacing of the beats and time interval between beats is known as the rhythm. Rhythm is either regular or irregular. All irregularities should be reported to the nursing supervisor.

The pulse rate for infants and children is more rapid than for the average adult. As a child reaches adulthood the pulse rate decreases to approximately 70 per minute. The average pulse rate at various ages are as follows:

<u>Age</u>	<u>Pulse Rate (beats per minute)</u>
newborn to eleven months	120
2 years	110
4-6 years	100
8-10 years	90
14 years	80
Adult	70

HOW TO COUNT PULSE RATE

Pulse is counted before certain drugs are given.

1. Wash hands by correct procedure.
2. Gather equipment: watch with a second hand, pencil, paper.
3. Identify individual and match with medicine card or MAR. (Check chart for picture if unsure.)
4. Explain procedure in terms individual can understand.

5. Position individual. (Lie down or sit down and have palm of individual's hand facing down with arm supported.)
6. Place flat surface of your middle fingers lightly over individual's radial artery. Count each beat as one beat.
7. When pulse beat is felt, note rhythm and strength of beat.
8. Note position of second hand on watch and count pulse for one full minute.
9. Record pulse rate immediately on paper. (Do not rely on memory.)
10. If pulse rate is below 60 and/or any irregular beats or volume are noted, report immediately to person in charge.
11. Wash hands by correct procedure.
12. Record on correct forms.

BLOOD

If the blood vessels are the network of highways carrying nutrients and wastes, the blood may be thought of as the trucks and cars traveling along the highway. A person generally has 4 to 6 liters (quarts) of blood depending on size, sex, age, and general health. Both the quality and quantity of blood are indicative of health. There are two types of blood cells. They are: Red Blood Cells (RBC) which carry oxygen to cells and carbon dioxide away from the cells, and White Blood Cells (WBC) which protect the body from infection by destroying germs.

Disease conditions of any part of the circulatory system will have an effect on the total system. In general there are two main conditions for which the (heart) medications are used: heart failure and irregular heartbeat.

Heart "failure" means that the heart has failed as a pump. When a person is in good health, the heart accomplishes circulation without faltering. Thus, it does not allow an abnormal amount of blood to accumulate in the veins, in the heart chambers, or in the lungs. The rate of flow is sufficient to provide normality throughout. A failing heart may have such a handicap that it is unable to move blood satisfactorily. Digitalis preparations may be ordered which will change the rate, rhythm and strength of the heartbeat.

DIGITALIS PREPARATIONS

Medications used in the treatment of heart failure are obtained mainly from the digitalis family. The most common are: digitoxin and digoxin (Lanoxin). The primary action of these medications is to slow and strengthen the heart beat.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING DIGITALIS PREPARATIONS

It must be emphasized that digitalis preparations are extremely strong. As with all medications, be absolutely sure you administer the correct medication and dose. These preparations sound alike and have similar spelling. In order to avoid errors, check the label and look closely at the spelling and at the dose prescribed.

As you remember, the action of digitalis is to slow and strengthen the heart beat. Therefore, a major responsibility when giving a digitalis medication is to count the pulse prior to administering each dose. In adults, if the pulse is 60 or below, the medication should be held and the physician or nurse notified immediately for further directions. Take pulse also before Inderal is administered.

The side effects of digitalis preparations may include:

- Loss of Appetite
- Nausea or Vomiting
- Visual Disturbances
- Headache
- Diarrhea

ANTIARRHYTHMIC MEDICATIONS

These medications regulate the heartbeat. Always check the pulse rate before administering these drugs. In adults, if the pulse is 60 beats per minute or less, the medication should be held and the physician or nurse be notified immediately for further direction. Blood pressure should also be monitored and notify the nurse of any abnormal readings.

Table 4.1

Antiarrhythmic Medications

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
quinidine sulfate	Cin-Quin, Quinidex	Tablet	Slows heart rate and increases strength	Diarrhea, Skin rash, loss of appetite, nausea, vomiting, confusion	May be given with food to decrease stomach upset.	Before giving medication, check pulse; if below 60 hold medication and notify nurse or physician.
propranolol hydrochloride	Propranolol	Tablet		Occasional low blood pressure, mental depression		
propranolol	Inderal	Tablet		Constipation/ diarrhea	Give before meals. Food may decrease the effectiveness of the medication.	Smoking should be avoided.

DRUGS THAT AFFECT THE BLOOD VESSELS

Abnormal conditions affecting the arteries and veins are many in number and variety. Medications may be used to increase or decrease the size of the blood vessels and thus affect the flow of blood through them.

VASODILATORS

Vasodilators increase the size of the blood vessel which, in turn, increases circulation. Hardening of the arteries (arteriosclerosis) is a fairly common problem. Arteriosclerosis results in a decreased blood flow. This decrease in blood flow may cause severe chest pain (angina) and poor circulation to the extremities.

Vasodilators may be used routinely to prevent chest pain and increase circulation.

However, you may also see them used during an attack of chest pain to reduce the severity of the pain. Nitroglycerine is the most common medication used for chest pain and is administered sublingually. (Tablet is held under tongue and allowed to dissolve). Nitroglycerin works very fast and the chest pain is relieved within seconds. If a individual is using nitroglycerin, they should keep it with them or readily accessible. Individuals should be given specific directions and guidance if they carry the medicine with them. Nitroglycerine deteriorates readily and becomes inactivated by light, heat, air, moisture and age. The individual or the direct care giver should be responsible for proper storage of these medications. In addition, individuals should be instructed to report when they take the medication as they will help us to know:

- How often pain occurs?
- How much medication is taken?
- If medication relieves pains?
- When does individual get relief?

Alcohol should be avoided when a person is taking vasodilators because alcohol can also act as a vasodilator and can potentiate (add to) the medication's action.

Nitroglycerine is also available as an ointment (Nitro-Bid). The ointment comes with a dose measuring applicator. The ointment can be applied to any convenient skin area, but most people use the chest area. Specific directions for application technique may be supplied by the pharmacist. Do not touch ointment with your fingertips.

Side effects that may occur with vasodilators are:

- Headache
- Low Blood Pressure
- Nausea/Vomiting
- Dizziness
- Weakness
- Skin Rash

The following tables give additional information on vasodilators. Coronary vasodilators are used for chest pain and peripheral vasodilators are used to increase circulation in the extremities (Tables 4.2 & 4.3).

Table 4.2
Coronary Vasodilators

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
amyl nitrite	Amyl Nitrite	Inhalation, Cloth covered ampule which is crushed and fumes inhaled	Acute chest pain	Flushed face, Headache, Pupil dilation, nausea, dizziness	Always avoid alcohol when taking these medications	Lie down when taking medication.
nitroglycerin	Nitro-Bid, Glytrate	Sublingual Tablet-Relief In 1 - 2 minutes				If individual is independent in medication use we should know how often they use medication, whether relief is partial or complete and whether there are any side effects. Avoid alcohol
isosorbidedinitrate	Isordil, Iso-Bid	Sublingual Tablet, Chewable Tablet				

Table 4.3
Peripheral Vasodilators

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
papaverine hydrochloride	Blupar, Cerebid, Pavabid	Tablet	Dilates peripheral vessels to improve circulation	flushed face, headache, nausea, vomiting, dryness of mouth and throat, arrhythmias, sweating	Give with meal to reduce stomach upset.	If urine turns very dark contact physician.

HIGH BLOOD PRESSURE (HYPERTENSION)

Hypertension, a condition in which blood pressure is abnormally high, is one of the leading causes of strokes, heart attacks, and kidney disease. An estimated 24 million Americans have hypertension disease. In the majority of hypertension cases (approximately 90 percent), the cause of hypertension is unknown; the goal of medication therapy is to lower the blood pressure without causing excessive side effects.

Before discussing medications used to treat hypertension, some information about SALT and DIET is important. Salt is a mineral necessary for good health. However, people tend to overuse salt. Salt can contribute to hypertension as it holds water in the body. The increased water content increases the blood pressure. Therefore, if foods high in salt are avoided, blood pressure will be lower. In addition to salt, overweight is a factor contributing to hypertension. So people who are overweight should be encouraged to lose weight.

There are two classifications of medications used to treat hypertension: diuretics and antihypertensives. (See Tables 4.4 and 4.5)

ANTIHYPERTENSIVES

Antihypertensives are medications that are used to treat high blood pressure (hypertension).

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTIHYPERTENSIVE DRUGS

The major caution to observe with these medications is to monitor blood pressure. The possible side effects which may occur with antihypertensive medications are:

- Fatigue
- Nasal Congestion
- Loss of Appetite
- Dizziness
- Dryness of Mouth

In general, nasal congestion and dryness of mouth are most common when individuals begin taking these medications. Instructing the individual in good oral hygiene will help relieve mouth dryness. Review Table 4.4 for some common antihypertensives and specific side effects.

**Table 4.4
Antihypertensives**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
hydralazine hydrochloride	Apresoline, Hydralazine	Tablet	Hypertension	Loss of appetite, headache, tachycardia, nausea, vomiting, diarrhea	Give with meals to increase absorption	Individual may become dizzy when first standing.
prazosin clonidine alpha methylodopa	Minipress Catapres Aldomet			Low pulse, rash, fever, fatigue		May darken urine.

NOTE: Minor tranquilizers may be given for high blood pressure.

DIURETICS--Diuretics increase urinary and salt excretion. They may cause a loss of potassium. Potassium is necessary for skeletal and heart muscle function. Signs of potassium (K+) depletion are:

- muscle weakness
- fatigue
- leg cramps
- irregular heartbeat

To avoid potassium depletion, the physician may order to encourage the individual to eat foods that are high in potassium content or the physician may order a supplement. If signs of potassium depletion are noticed, notify your nurse.

**Table 4.5
Diuretics**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
acetazolamine	Diamox, Hydrazol	Tablet	High Blood Pressure	Potassium loss, nausea, dizziness, numbness of extremities, irritability, diarrhea, skin rash, loss of appetite	Avoid monosodium glutamate(MSG) which is seasoning often used in Oriental food. May be taken with food to decrease stomach upset.	Tolerance after prolonged administration may necessitate an increase in dosage. No supplemental potassium.
chlorothiazide	Diuril			eyes sensitive to sun light.		
hydrochlorothiazide spironolactone	Hydrodiuril Aldactone	Tablet	Rid body of excess fluid and reduce blood pressure.			
furosemide	Lasix	Tablet & injection				Consult with physician or dietitian to provide high potassium diet.

ANTICOAGULANTS--This group of medications are related to blood clotting. Blood clot formation is a process which is essential to life. Without this process, a person with a simple cut would hemorrhage and survival could be threatened. However, sometimes this mechanism of clot formation is inadequate and creates physical problems. Anticoagulants are medications which decrease clot formation. The reverse of this is also possible. The clotting mechanism may be insufficient and the clotting process is inadequate. Coagulants increase clot formation.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING

ANTICOAGULANTS --The major caution to observe with anticoagulation therapy is the possibility of hemorrhage. The signs and symptoms related to hemorrhage are:

- Nose Bleeds
- Blood in the Stools
- Bleeding Gums
- Black and Blue Marks
- Blood in the Urine
- Change in Vital Signs

The most common anticoagulant is Warfarin sodium, see Table 4.6.

Table 4.6

Anticoagulant

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
warfarin sodium	Coumadin, Panwarfin	No average dose. Dosage is ordered to correlate with blood test results. Tablets are available in 2, 2.5, 5, 7.5, 10, & 25 mg sizes.	Will not dissolve existing clots, but will help prevent new clots from forming.	Hemorrhagic accidents are the chief danger of anticoagulant therapy first signs that this may be occurring are: blood in urine, nose bleeds, bleeding gums. Individual will develop black & blue marks easily. Diarrhea, nausea, cramps, rash, loss of hair.	Medications which increase anticoagulant action = aspirin, quinidine, phenothiazides, chloralhydrate, thyroid preparations, alcohol, phenytoin, oral contraceptives.	Prothrombin times are the blood tests which are done routinely when individuals are on anticoagulants. Have individual use electric razor, give medication at same time each day.

Answer Self-Test Questions--Lesson 10: Section 4--Medications That Affect The Cardiovascular System