

STATE OF LOUISIANA

DEPARTMENT OF HEALTH AND HOSPITALS

OFFICE FOR CITIZENS

WITH DEVELOPMENTAL DISABILITIES

MEDICATION ADMINISTRATION COURSE

GUIDELINES

PROMULGATED LOUISIANA REGISTER

JULY 20, 1995

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STATE OF LOUISIANA
DEPARTMENT OF HEALTH AND HOSPITALS
OFFICE FOR CITIZENS WITH DEVELOPMENTAL DISABILITIES
MEDICATION ADMINISTRATION COURSE
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Title 48

PUBLIC HEALTH - GENERAL

Part IX. Mental Retardation/Developmental Disabilities Services

Chapter 9. Guidelines for Certification of Medication Attendant

§901. Overview

A. R.S. 37:1021-1025 authorizes the establishment of a medication administration course for the purpose of training and certifying unlicensed personnel to administer certain medication to residents of intermediate care facilities for the mentally retarded (ICFs/MR) and community homes for the mentally retarded either operated by the Office for Citizens with Developmental Disabilities (OCDD) or funded through the Department of Health and Hospitals (DHH); and to individuals in programs/agencies contracting for services with DHH except as prohibited in §911.B.5. Persons who successfully complete the medication administration course and demonstrate an acceptable level of competency on a written test and a practical examination are eligible for certification as medication attendants. Use of certified medication attendants (CMAs) on the part of private providers that contract with DHH is strictly voluntary.

B. The guidelines establish:

1. Qualifications for instructors and CMA applicants
2. Authorized functions and prohibitions of certified medication attendants
3. Certified medication attendant 60 hour course curriculum
4. Requirements for initial certification and ongoing re-certification of medication attendants and reciprocity
5. Decertification and appeal process
6. Provider responsibilities
7. Role and responsibilities of the Office for Citizens with Developmental Disabilities
8. Composition and role of Certified Medication Administration Committee

§903. Definitions

For the purpose of these CMA guidelines, the following definitions shall apply:

Abuse -

- a. the infliction of physical or mental injury; or
- b. causing deterioration to such an extent that the consumer's health, morale, and/or emotional well-being is endangered. Cause of such deterioration may include but is not limited to the following:
 - i. sexual abuse;
 - ii. exploitation;
 - iii. extortion of funds or other things of value.

CMA Applicant -

an employee of a provider agency who is enrolled in the 60 hour course curriculum.

Certified Instructor -

a registered nurse (RN), with a minimum of one year experience working with the developmentally disabled, who has completed the training for instructors, and has been certified by the Office to teach the 60 hour medication administration course.

Certified Medication Attendant (CMA) -

the designation given an employee who has successfully completed the 60 hour course and passed the OCDD initial certification exam and has been issued a certificate by the office.

Community Home -

a small community based intermediate care facility for the mentally retarded.

Cruelty to the Infirm -

the intentional or criminally negligent mistreatment or neglect whereby unjustifiable pain or suffering is caused to the infirm, disabled adult who is a resident of a mental retardation facility.

Department -

the Department of Health and Hospitals (DHH).

Developmental Center -

a state ICF/MR operated by the Office for Citizens with Developmental Disabilities.

Falsification or Alteration of CMA Certificate -

includes, but is not limited to, altering expiration date, CMA name, OCDD coordinator's signature, or attempting to use another person's certificate.

Falsification of Consumer Medical Records -

includes, but is not limited to, falsification of time, dosage, date, amount, and documentation of prescribed treatment that did not occur.

ICF/MR -

Intermediate Care Facility for the Mentally Retarded - a 24 hour residential facility funded through the Department of Health and Hospitals and is either state or privately operated. An ICF/MR can either be a small facility with 15 or less beds or a large facility with 16 or more beds.

Misappropriation of Resident's Property -

to take possession, without permission, of resident's personal belongings. Misappropriation includes but is not limited to taking the following:
a. clothing; b. jewelry; c. money; d. electronic equipment such as radios, stereos, video cassette recorders, and televisions.

Neglect -

the CMA's failure to provide the proper or required medical care, nutrition or other care necessary for a consumer's well-being.

Office -

the Office for Citizens with Developmental Disabilities (OCDD).

Regional Office -

the Regional Office for the Office for Citizens with Developmental Disabilities.

§905. Applicability

These guidelines shall apply only for certification of medication attendants who are:

1. Employed in facilities operated by the Office for Citizens with Developmental Disabilities;
2. Employed in community homes for the mentally retarded and/or small or large intermediate care facilities for the mentally retarded funded through the Department of Health and Hospitals;
3. Employed in program/agencies, except as prohibited by §911.B.5., contracting with the Department of Health and Hospitals for services to the developmentally disabled.

§907. Qualifications of Applicants to be Medication Attendants

- A. Each person accepted to participate in the medication attendant course shall be:
1. a citizen of the United States and a resident of Louisiana
 2. an employee of a facility operated by the OCDD, an ICF/MR, community home for mentally retarded, program or agency, except as prohibited by §911.B.5., funded through the Department of Health and Hospitals
 3. at least 18 years of age
 4. able to read, write, and comprehend the English language
 5. free of communicable diseases as documented by a current physician's statement
 6. have no known record or history of:
 - a. alcohol or drug abuse NOTE: MUST BE IN COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT
 - b. mental or physical abuse/neglect
 - c. molestation, or
 - d. conviction of a felony
- B. There will be no discrimination in selection of medication attendants for reason of race, color, creed, religion, disabilities, or national origin.

§909. Qualifications of Instructors for Certified Medication Administration Courses

- A. A registered nurse (RN) with a minimum of one year of clinical experience in a mental retardation setting qualifies as an instructor to teach the 60 hour course consisting of 40 hours classroom theory and 20 hours of clinical practical. The RN may delegate the 20 hours of practical training to a licensed practical nurse (LPN) with a minimum of one year of clinical experience in a mental retardation setting and knowledge of the course.
- B. The RN instructor must complete training offered by the Office in the curriculum and implementation of the medication attendant administration module prior to teaching the course.

- C. The Department of Health and Hospitals, Office for Citizens with Developmental Disabilities, may offer the medication administration instructor course on at least an annual basis, or as determined by the Certified Medication Attendant Committee.

§911. Authorized and Prohibited Functions of Certified Medication Attendants

A. Authorized Functions of the Certified Medication Attendant

1. Deliver medications ordered by a physician or dentist to residents for self administration
2. Deliver and administer medications ordered by a physician or dentist to residents with the supervision of a registered nurse as defined in LAC 46:XLVII.3703.10
3. Administer oral medications, enemas, douches, ointments, and suppositories unless otherwise indicated
4. Record in the resident's chart:
 - a. Doses delivered to and/or administered to the resident
 - b. Effectiveness of the drug
 - c. Any adverse effect of the drug
 - d. Appropriate vital signs as indicated by the physician order and/or knowledge of the drug
 - e. May transfer prescribed medication information to Medication Administration Record (MAR). Pharmacy transfer label may be used.
5. Administer 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 24 hours.

B. Prohibited Functions of the Certified Medication Attendant

1. May not give medications by intramuscular, intravenous, subcutaneous or tube (gastro/NG) routes.

2. **May not administer medications by the oral inhalant aerosol route unless administering a premeasured 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 medications in an acute care unit funded by DHH and/or operated by the OCDD.**
6. **May not administer any medications when there is indication that the medication has been inappropriately dispensed by the pharmacist or mishandled by other individuals.**

§913. Certified Medication Attendant Course Curriculum

Each applicant must complete a 60 hour course to become a certified medication attendant.

1. The course curriculum is 40 hours of classroom theory to include at a minimum, instruction in the following topics:
 - a. legal aspects
 - b. roles and responsibilities of drug administration
 - c. definitions
 - d. terminology
 - e. classification of drugs
 - f. measurement
 - g. identification
 - h. effects and side effects
 - i. distribution and route

- j. care and handling of drugs
- k. skills-tasks to be completed for competency
- l. documentation

2. Twenty hours practical which may consist of 10 hours of classroom demonstration and 10 hours on the unit for hands on experience. The applicant must attain proficiency in the following 25 skill areas, either by actual demonstration, or by verbally demonstrating to the satisfaction of the licensed nurse:

- a. hand washing
- b. oral medications
- c. liquid medications
- d. topical medications
- e. eye medications
- f. ear drops
- g. nose drops
- h. rectal suppositories
- i. vaginal suppositories/cream
- j. disposable enemas
- k. disposable douches
- l. counting pulse
- m. counting respirations
- n. taking blood pressure
- o. taking oral temperature
- p. taking rectal temperature
- q. taking axillary temperature

- r. premeasured transdermal patches
- s. nasal atomizer
- t. oral powdered medications
- u. charting
- v. crushing tablets
- w. rectal creams
- x. premeasured dosage unit provided by the manufacturer of an oral aerosol inhalant
- y. limited sublingual medications

§915. Certification Requirements and Process

A. *Effective October 1, 1997, all CMA certificates will be issued for a certification period of October of one calendar year to October of the next calendar year. All certificates issued after October 1, 1997 will expire for October 31, 1998.*

1. The agency administrator/representative must complete Form CMA - 1, Profile Sheet, for each employee CMA applicant, acknowledging that all the qualifications outlined in §907 are met prior to the applicant attending the course.
2. The CMA applicant must complete the 60 hour course; 40 hours of classroom theory, and 20 hours of practical with 10 hours conducted in the work place.
3. The CMA applicant must demonstrate proficiency in the 25 skill areas to pass the practical portion of the course. A RN or LPN must administer the practical. Proficiency may be either verbal or physical demonstration. A pass/fail grade shall apply.
4. After completion of the 60 hour course, the CMA instructor completes Form CMA - 2, Initial Exam and Certification Request, and sends it to the regional office or the developmental center coordinator to request applicant(s) be scheduled for the written OCDD CMA certification exam. Form CMA - 2, must be attached to the Form CMA -1, Profile Sheet for each applicant.
5. The regional office or the developmental center coordinator will:
 - a. establish a test date.
 - b. notify the central office coordinator to mail the exam to the regional office/developmental center coordinator. The exam consists of 50

questions at two points each for a total possible score of 100 points.

- c. administer the test.
- d. return test(s) to the central office coordinator for grading and scoring.
- e. notify CMA instructors as to applicants' scores.
- f. assist CMA instructors regarding any questions.

6. The central office coordinator will:

- a. grade each test and determine test score.
 - i. A test score of 80 is required to pass the exam.
 - ii. A test score between 70 and 78 allows the test to be retaken once without repeating the course.
 - iii. A test score below 70 requires a repeat of the entire 60 hour course.
- b. send the regional office/developmental center coordinator the exam scores.

7. Upon passing the OCDD CMA certification exam, the applicant is designated as a CMA.

8. The central office coordinator will issue two certificates; one for the CMA, and one for the requesting provider agency.

9. The certificate shall include at least the following:

- a. name of CMA
- b. expiration date
- c. signature of central office coordinator

B. Recertification

1. ***Recertification requirements outlined in §917.A will be waived for existing CMAs for the first certification period of October to October.***
2. ***Recertification requirements outlined in §917.A will be required for the CMA to be recertified for each subsequent certification period of October to October.***

3. *All initial certification issued after October 1998 will expire in October of the certification period in effect.*
4. *Recertification requirements outlined in §917.A will be waived the first certification period of October to October.*
5. *Recertification requirements outlined in §917.A will be required for the CMA to be recertified for each subsequent certification period of October to October.*

§917. Re-certification Requirements and Process

- A. Annual Requirements. On an annual basis each CMA must be recertified. The requirements for re-certification are:
 1. completion of a total of nine hours of in-service training, two of which directly relate to the agency's medication administration policy and procedure. **The remaining seven hours on in-service must relate to medication administration.** A CMA working in multiple agencies may combine training to meet these requirements with the exception that the two hours training on medication administration policy and procedure **REQUIRED PER AGENCY EMPLOYED AS A CMA.** Each agency must have documentation of each CMA(s) required nine hours of in-service training.
 2. pass with proficiency, either by physical or verbal demonstration, the 25 skills on the practical checklist.
- B. Upon successful completion of these requirements the CMA instructor sends Form 3a. and Form 3b. to the central office coordinator.
- C. The central office coordinator issues two certificates. One certificate is for the CMA and the other is for the requesting provider agency.
- D. This process must be repeated annually, prior to the month of expiration of the CMA's certification.
- E. A CMA who has not worked directly with medication administration in a facility, program, or agency for the mentally retarded for 12 months or more must repeat the 60 hour course and pass the OCDD CMA certification exam prior to being re-certified.

§919. Decertification of Medication Attendants

- A. Decertification shall occur under the following conditions:
1. falsification of consumer medical records as defined in these regulations
 2. found guilty of abuse, neglect or cruelty to the infirmed as defined in these regulations
 3. found guilty of misappropriation of a resident's property as defined in these regulations
 4. falsification or alteration of CMA certificate issued by the office as defined in these regulations
 5. falsification of CMA qualifications
 6. failure to meet CMA qualifications
- B. Decertification may occur under the following conditions:
1. failure of CMA to obtain annual re-certification requirements. The CMA may be reinstated if the recertification requirements are met within six months of expiration of the certificate. During this six month period the CMA's authorized functions shall be suspended.
 2. unsatisfactory performance of CMA reported by a licensed nurse, either RN or LPN, can result in either a temporary suspension of the CMA's medication administration privileges or decertification. The RN may choose to suspend CMA medication administration privileges not to exceed three months and provide training during which time the CMA may administer medications only under RN or LPN direct observation. After completion of designated suspension and training, the RN reserves the right to re-instate medication administration privileges or decertify the CMA. If decertified, the CMA must repeat the 60 hour course and retake the OCDD CMA certification exam. **The suspension of CMA medication administration privileges DOES NOTE EFFECT THE EXPIRATION DATE OF THE CERTIFICATION.**
- C. Based on the aforementioned criteria, the RN in consultation with the agency administrator makes the decision to decertify the CMA.
- D. The RN/CMA instructor sends a confidential letter and FORM CMA 4 - Decertification Form to both the CMA and the central office coordinator identifying the reasons for decertification of the individual.
- E. A copy of the decertification letter and FORM CMA 4 along with pertinent documentation is maintained in the provider's records.

§921. Appeal Process

- A. A CMA who has had privileges suspended or has been decertified has the right of appeal.
- B. **Notice of Violations.** When there are substantiated charges against the CMA, either through oral or written evidence, the OCDD will notify the individual(s) implicated in the investigation of the following information by certified mail:
1. the nature of the violations, and the time and date of each occurrence;
 2. the state's intent to report these violations to the CMA registry; and
 3. the right to request an informal discussion and/or the right to an administrative hearing.
- C. **Right To An Informal Discussion.** When a CMA feels that he/she has been wrongly accused, the following procedure should be followed.
1. Within 15 calendar days of the receipt of the office's notice of violation, the CMA may request an informal discussion.
 2. Such request must be made to the office in writing. A meeting will be arranged within 20 days of such a request. The informal discussion is designed to provide an opportunity for:
 - a. the CMA to informally review the situation;
 - b. the agency to offer alternatives based on corrections or clarifications, if any; and
 - c. the CMA to evaluate the necessity for seeking an administrative hearing.
 3. During this informal discussion, the CMA will be afforded the opportunity to talk with office personnel involved in the situation, to review pertinent documents on which the alleged violation is based, to ask questions, to seek clarifications, and to provide additional information.
- D. **Right To Request Administrative Hearing**
1. Within 30 calendar days after the receipt of notice of the office's notice of violation or the notice of results of informal discussion, the CMA may request an administrative hearing. Such request must be in writing to the Office of the Secretary Attention Bureau of Appeals. The request must contain a statement setting forth the specific charges with which s/he disagrees, and the reasons for this disagreement.
 2. Unless a timely and proper request is received by the appeals section, the findings of the OCDD shall be considered a final and binding administrative determination. Notification will then be entered to the CMA registry.

E. Basic Provisions

The administrative hearing shall be conducted in accordance with the Louisiana Administrative Procedure Act, R.S. 49:965 et seq., and the provisions set forth in the procedures described therein.

F. Right To Counsel

Any party may appear and be heard at any appeals proceeding through an attorney at law or through a designated representative.

G. Appearance In Representative Capacity

1. A person appearing in a representative capacity shall file a written notice of appearance on behalf of a provider:
 - a. identifying himself by name, address and telephone number, and
 - b. identifying the party represented, and
2. A such person shall have a written authorization to appear on behalf of the provider.

H. Preliminary Conference

1. Although not specifically required, the appeals bureau may schedule a preliminary conference. The purposes of the preliminary conference include but are not limited to the following:
 - a. clarification, formulations and simplification of issues;
 - b. resolution of matters in controversy;
 - c. exchange of documents and information;
 - d. stipulations of fact so as to avoid unnecessary introduction of evidence at the formal review;
 - e. the identification of witnesses; and
 - f. such other matters as may aid disposition of the issues.
2. When the appeals bureau schedules a preliminary conference, it shall notify all parties in writing. The notice shall direct any parties and their attorneys to appear at a specified date, time, and place.

I. Results of Preliminary Conference

1. Where the preliminary conference resolves all or some matters in controversy, a summary of the findings agreed to at the conference shall be provided by the administrative law judge.

2. Where the preliminary conference does not resolve all matters in controversy, an administrative hearing shall be scheduled on those matters still in controversy. The hearing shall be scheduled within 30 calendar days following the completion of the preliminary conference, or at a time mutually convenient to all parties.

J. Notice of Administrative Hearing

When an administrative hearing is scheduled, the appeals bureau shall notify the CMA and/or his representative and the office representative, in writing of the date, time and place of the hearing. Notice shall be mailed not less than 10 calendar days before the scheduled date of the hearing.

K. Conduct of Hearing

1. The hearing shall be conducted by the administrative law judge from the appeals bureau.
2. Testimony shall be taken only on oath, affirmation, or penalty of perjury.
3. Each party shall have the right to call and examine parties and witnesses; to introduce exhibits; to question opposing witnesses and parties on any matter relevant to the issue even though the matter was not covered in the direct examination; to impeach any witness regardless of which party first called him to testify; and to rebut the evidence against him.
4. Any relevant evidence shall be admitted if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs regardless of the existence of any common law or statutory rule which might make improper the admission of such evidence over objection in civil or criminal actions. Documentary evidence may be received in the form of copies or excerpts.
5. The administrative law judge may question any party or witness and may admit any relevant and material evidence.
6. The administrative law judge shall control the taking of evidence in a manner best suited to ascertain the facts and safeguard the rights of the parties. Prior to taking evidence, the administrative law judge shall explain the issues and the order in which evidence will be received.
7. A party has the burden of proving whatever facts it must establish to sustain its position.
8. The burden of producing evidence to substantiate the written charge(s) will be on the provider of services. Once the burden of producing evidence to substantiate the charges has been met, the CMA and/or his representative shall have the burden of producing evidence answering the charges.

L. Witnesses and Subpoena

1. Each party shall arrange for the presence of their witnesses at the hearing.
2. A subpoena to compel the attendance of a witness may be issued by the administrative law judge upon written request by a party and a showing of the need therefor.
3. A subpoena may be issued by the administrative law judge on his own motion.
4. An application for subpoena duces tecum for the production by a witness of books, papers, correspondence, memoranda, or other records shall be made in writing to the administrative law judge, giving the name and address of the person or entity upon whom the subpoena is to be served. The application shall precisely describe the material that is desired to be produced and shall state the materiality thereof to the issue involved in the proceeding. It shall also include a statement that, to the best of the applicant's knowledge, the witness has such items in his possession or under his control.

M. Continuance of Further Hearings

1. The administrative law judge may continue a hearing to another time or place, or order a further hearing on his own motion or upon showing of good cause, at the request of any party.
2. Where the administrative law judge determines that additional evidence is necessary for the proper determination of the case, he may at his discretion:
 - a. continue the hearing to a later date and order the party to produce additional evidence; or
 - b. close the hearing and hold the record open in order to permit the introduction of additional documentary evidence. Any evidence so submitted shall be made available to both parties and each party shall have the opportunity for rebuttal.
3. Written notice of the time and place of a continued or further hearing shall be given except that when a continuance of further hearing is ordered during a hearing, oral notice of the time and place of the hearing may be given to each party present at the hearing.

N. Record of Hearing.

A sound recording of the hearing shall be made. A transcript will be prepared and reproduced at the request of a party to the hearing provided he bears the cost of the copy of the transcript.

O. Decision

1. At the conclusion of the hearing, the administrative law judge shall take the matter under submission.

2. The administrative law judge shall prepare a written proposed decision which will contain findings of fact, a determination of the issues presented, a citation of applicable policy and regulations, and an order.
3. The appeals bureau, on behalf of the secretary of the DHH, may adopt the proposed decision or may reject it based upon the record, or it may be remanded to the administrative law judge to take additional evidence. In the latter case, the administrative law judge thereafter shall submit a new proposed decision.
4. The decision shall be final and binding upon adoption on behalf of the secretary, subject only to judicial review by the courts. Copies of the decision shall be mailed to the CMA at his last known address and to any representative thereof.

P. Failure to Appear

1. If a CMA fails to appear at a hearing, a decision may be issued by the appeals bureau dismissing the hearing. A copy of the decision shall be mailed to each party.
2. Any dismissal may be rescinded upon order of the appeals bureau if the CMA makes written application within 10 calendar days after the mailing of the dismissal, and provides evidence of good cause for his failure to appear at the hearing.

§923. Reciprocity

A provider whose employee furnishes documentation as to successful completion of an equivalent medication administration course conducted in another state and meets other criteria stated in these guidelines and successfully passes the CMA initial certification exam, may on a case by case basis be granted reciprocity. The provider agency would complete FORM CMA -5, Reciprocity Request, and mail to the central office OCDD coordinator. The Certified Medication Attendant Committee will review the documentation and determine if the individual will be certified as a CMA in Louisiana. If reciprocity is granted, the provider is notified and the central office OCDD coordinator would issue the certificates to the provider.

§925. Provider Responsibility

- A.** Each provider shall maintain records on each CMA. The records must include:
1. The current monitoring skills checklist required for certification and re-certification.
 2. A copy of the current certificate issued to the CMA by the central office coordinator.
 3. Documentation of annual continuing education necessary for re-certification of CMA.

- B. The provider is legally responsible for the level of competency of its personnel and for ensuring that unlicensed staff administering medications have successfully completed the medication administration course curriculum. Additionally, the provider is responsible for maintaining annual re-certification requirements of their CMA's and that their CMA's perform their functions in a safe manner.
- C. The provider shall conduct thorough employment checks including verification of CMA certification.
- D. The provider is responsible for contacting the central office to verify that a CMA is in good standing prior to employing a CMA certified by another provider. The central office coordinator will send the provider FORM CMA -6 verifying that the CMA is in good standing. FORM CMA -6 must be maintained on file in the providers records. The CMA would be responsible for providing a copy of their certificate to the provider.

§927. Office for Citizens with Developmental Disabilities Responsibilities

The OCDD shall ensure the integrity of the medication administration course by:

1. implementing the CMA Law, R.S. 37:1021-1025
2. revising guidelines
3. issuing tests for initial certification of CMAs
4. maintaining the originals of written examinations with scoring
5. maintaining a roster of certified instructors
6. issuing certificates
7. offering an instructor's course
8. chairing the Certified Medication Administration Committee
9. verifying CMA's in good standing
10. maintaining a CMA registry

§929. The Certified Medication Administration Committee

- A. Composition of Committee as determined by the Assistant Secretary of OCDD
 1. designated CMA instructors
 2. central office coordinator
 3. two OCDD regional managers
 4. two office CMA instructors from the developmental centers

5. a consumer
6. other representatives as determined by the Office

B. Responsibilities of the Committee

1. Provide input regarding CMA program aspects such as guidelines, course curriculum, instructor training
2. Review requests for reciprocity status
3. Offer assistance to CMA instructors upon request

§931. CMA FORMS

1. Form CMA - 1

is the profile sheet completed by the provider agency's administrator/representative to attest that all qualifications are met for the CMA applicant to attend the 60 hour medication administration course. This form is given to the CMA instructor.

2. Form CMA - 2

is the exam request and initial certification request form completed by the CMA instructor and sent to either the regional office or developmental center coordinator to request the Office schedule CMA applicant(s) for the OCDD CMA certification exam. FORM CMA -1 must be attached to the CMA -2 for each CMA applicant to be scheduled for the test. For those applicants that pass the test, the Office will send the certificates to the CMA instructors.

3. Form CMA - 3a. and 3b.

are the re-certification request completed by the CMA instructor acknowledging that all recertification requirements are met. The CMA instructor sends these forms to the central office coordinator for issuance of certificates.

4. Form CMA - 4

is the decertification form completed by the CMA instructor identifying the reasons for decertifying the CMA and sent to the central office coordinator. FORM 4 is also sent to the CMA along with a confidential letter. A copy of FORM CMA - 4 must be maintained in provider agency records.

5. Form CMA - 5

is the reciprocity request form the provider agency would complete for employees that furnish documentation of successful completion of an equivalent medication administration course from another state. This form is sent to the central office coordinator for review and determination.

6. Form CMA - 6

is the form completed by the central office coordinator verifying a CMA is in good standing. This form is sent to provider agencies who employ a CMA in good standing certified by another agency. FORM CMA - 6 must be kept on file in the provider records.

LOUISIANA
DEPARTMENT OF
HEALTH and HOSPITALS

OFFICE FOR CITIZENS WITH
DEVELOPMENTAL
DISABILITIES

MEDICATION
ADMINISTRATION COURSE

TRAINEE MANUAL

APRIL, 1996

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

TRAINEE MANUAL

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Introduction for Trainee's Manual

PREFACE

The medication administration training you are beginning is a very vital part of training that will teach you the skills and knowledge needed to properly and safely administer medication to individuals in programs for the developmentally disabled.

Every effort has been made to reduce the amount of technical language used; however, since pharmacology is directly related to the chemical sciences, some techno-scientific terminology is unavoidable. The instructor may need to interpret some of these into everyday terms.

It is important that you learn the information presented in this course. Not only will it help you do your job properly, it will help the individuals you care for receive their needed medications safely. Just as medicine is helpful, it can also be harmful. Therefore, it is very important that you not only learn all the material, but that you follow it always.

ORGANIZATION

Each section of this course contains objectives at the beginning of the lesson to give you an outline of items that you will be learning in that particular lesson.

At the end of each section, you will be expected to study and answer questions that cover the content of the section. These questions will test your knowledge of the section. The written exam at the end of this course will be easier if you use your time wisely in class and study the self-test questions and answers.

A glossary is provided for you at the end of the course content. Use this to define medical terms you are not familiar with in the course. Remember: the instructor is there to help you, therefore it is important for you to ask questions and seek help from the instructor whenever you are confused or do not understand the information the instructor is presenting to you.

This is your manual to take with you to your agency. Please feel free to jot down information from the instructor in the manual. Underline or highlight information emphasized as important by the instructor.

In addition to medication administration information, your instructor will provide information to you about how your agency policy addresses specific issues and topics. In these areas your agency policies and procedures will take precedence over information presented in this manual.

This course includes 40 hours of theory or classroom instructions and 20 hours of practicum or on the job training. Your instructor will go over the specifics with you regarding this area of the course.

REMEMBER:

This course is for you to develop skills and knowledge needed to properly and safely administer medications to individuals you serve. Ask questions now, during the course and when you are back at work administering medications. If you have any doubt or questions about a medication you are administering, don't give it! Call your supervisor, the nurse, physician or pharmacist to get clarification or to answer your question. **A single mistake in administering a medication can be extremely dangerous.**

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 only to the office for citizens with developmental disabilities of the Department of Health and Hospitals, to community homes for persons with mental retardation funded through the Department of Health and Hospitals, to 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 division of mental retardation or community homes for persons with mental retardation funded through the Department of Health and Hospitals or the Department of Social 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.
6. There will be no discrimination in selection of medication attendants for reason of race, color, creed, religion, or national origin, or disabilities.

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 Bagners,
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***

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 premeasured 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 medication to the residential staff, individuals, monthly medication administration, storage, use and appropriateness of therapy by performing quarterly drug reviews
- C. Registered nurses and licensed practical nurses--administer medication, ordered by the physician, transfer telephone orders to writing and monitor 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 (OTC) medications 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.

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.

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 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 person's 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 than 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. 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 medication 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:

- a. Give the Right Medication
- b. Give the Right Dose
- c. Give the medication to the Right Individual
- d. Give medication by the Right Route
- e. Give medication at the Right Time
- f. Provide the Right Documentation

*VII
A.1.
Six rights
of medication
administration.*

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-----Aquasol
 Aralen-----Aridin
 Arlidin-----Aeroline
 Atarax-----Enarx
 Azotrex-----Afrodex

B

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

C

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

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
 Digitoxin-----Digoxin
 Digoxin-----Desoxyn
 Dilantin-----Delaluitn
 Disophrol-----Isuprel
 Diunil-----Doriden
 Diutensen-----Salutensin
 Diutensen-----Unitensen
 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-----Estinvi
 Esimil-----Ismelin
 Estomul-----Isomel
 Eutonyl-----Eutron

F

Feosol-----Felsol
 Feosol-----Feostat
 Feosol-----Fer-In-Sol
 Feosol-----Festal
 Fulvicin-----Furazone

Coramin-----Calamine

G

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

I

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

L

Lidaform-----Vioform
Loridine-----Leritine
Luride-----Loryl

N

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

O

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

Fostex-----Phisohex

H

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

K

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

M

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

Modane-----Mudrane

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-----Phenaphen

Q

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

S

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

U

Unipen-----Unicap
 Unnitensen-----Salutensin

W

Wyamine-----Wydase

R

Rabellon-----Rebinul
 Regroton-----Regroton
 Rifadin-----Ritalin
 Ritalin-----Rismelin

T

Taractan-----Tetractin
 Tedral-----Tefalin
 Tegopen-----Tegrotol
 Tegopen-----Tegro
 Temaril-----Dentrol
 Tepanil-----Temaril
 Tepanil-----Terfonyl
 Terfonyl-----Tolamin
 Thiamine-----Thioctarin
 Triamcinalone-----Triamcinacin
 Tuinal-----Tyletal
 Tyzine-----Vizine

V

Vigran-----Wigraine

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

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, Nembutal).
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).
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-diarthra purposes. Donnagel PG) some cough syrups.

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.

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

BRAND NAME

Achromycin, Sumycin
 Acthar
 Adrenalin
 Afrin
 Aldomet
 Amoxil
 Antepar
 Antiminth
 Aquasol A
 Aquasol E
 Aquamephton
 Aristocort
 Artane
 Aspirin
 Ascorbic Acid
 APC
 Atarax
 Aventyl
 Baciguent
 Benadryl
 Betapen VK
 CeViSol
 Chloremycetin
 Cleocin
 Cogentin
 Compazine
 Cordran
 Coumadin
 Cytomel
 Darvon
 Darvon Compound 65

 Decadron
 Depro-Provera
 Desenex
 Dexedrine
 Diamox
 Dimetane
 Diodoquin
 Diuril
 Dilantin
 Dramamine
 Dulcolax
 Elavil
 Empirin

GENERIC NAME

Tetracycline
 Adrenocorticotrophic Hormone
 Epinephrine
 Oxymetazoline
 Methyldopa
 Amoxicillin
 Piperazine
 Pyrantel Pamoate
 Aqueous Vitamin A
 Aqueous Vitamin E
 Vitamin K
 Triamcinolone
 Trihexphenidyl HCl
 Acetylsalicylic Acid
 Vitamin C
 Aspirin, Phenacetin and Caffeine
 Hydroxyzine HCl
 Nortriptyline
 Bacitracin
 Diphenhydramine HCl
 Potassium P Penicillin
 Vitamin C drops
 Chloramphenicol
 Clindamycin HCl
 Benztropine HCl
 Prochlorperazine
 Flurandrenolide
 Warfarin Sodium
 Sodium Liothyronine
 Propoxyphene HCl
 Propoxyphene, Aspirin,
 Phenacetin & Caffeine
 Dexamethasone
 Medroxy-progesterone
 Zincundecate
 Dextroamphetamine
 Acetazolamide
 Brompheniramine maleate
 Diiodohydroxyquin
 Chlorothiazide
 Diphenylhydantoin
 Dimenhydramine
 Bisacodyl
 Amitriptyline HCl
 APC (Aspirin, Phenacetin and
 Caffeine)

BRAND NAME

Liquanil
Equagesic

Erythrocin
Feosol
Flagyl
Fluogen
Furacin
Furadantin
Gantanol
Gantrisin
Garamycin
Haldol
Ilosone
Isopto Carpine
Isuprel
Keflex
Kefzol
Kenolog
Lanoxin
Levodopa
Levodopa
six
Lincocin
Lomotil
Luminal
Macrodantin
Mandelamine
Marezine
Mellaril
Mephyton
Mesantoin
Milk of Magnesia
Minocin
Mintezol
Mycostatin
Mysoline
Mystedin F
Navane
Neosynephrine
Noctec
Paregoric
Pariactin
Penergan
Polaramine
Polycillin
Povan
Premarin
Principen

GENERIC NAME

Meprobamate
Etholheptazine
Meprobamate
Erythromycin
Ferrous Sulfate
Metronidzole
Influenza Vaccine
Nitrofurazone
Nitrofurantoin
Sulfamethoxazole
Sulfisoxazole
Gentamycin
Haloperidol
Erythromycin Estolate
Pilocarpine
Isoproterenol
Cephalexin
Cephazolin
Triamcinolone
Digoxin
Levodopa
Furoseminde
Lincomycin HCl
Diphenoxylate HCl
Sodium Phenobarbital
Nitrofurantoin
Methenamine Mandelate
Cyclizine
Thioridazine HCl
Vitamin K
Mephenytoin
Magnesium Hydroxide
Minocycline
Thiabendazole
Nystatin
Primidone
Tetracycline and Amphotericin B
Thiothixene
Phenylephrine
Chloral Hydrate
Tincture of Camphorated Opium
Cyproheptadine
Promethazine
Dexchlorpheniramine maleate
Ampicillin
Pyrvinium
Conjugated estrogens
Ampillicin

BRAND NAME

Prolixin
 Prostaphlin
 Pyrilgin
 Quinaglute Duratabs
 Rau sed, Sarpasil
 Ritalin
 Rubramin
 Seconal
 Senokot
 Selsun
 Serentil
 Serpasil
 Sinequan
 Stelazine
 Sudafed
 Sulamyd
 Sultrin
 Sumycin
 Surfak
 Synalar
 Talwin
 Tegopen
 Tergitol
 Tetrax-S Syrup
 Terramycin
 Thermotabs
 Thorazine
 Tinactin
 Tigan
 Tofranil
 Toin Unicelle
 Tridesilon
 Tylenol
 Unicap, Theragran
 Valium
 V-Cillin K
 Veetids
 Vibramycin
 Valisone
 Visine
 Vioform
 Vistaril
 Warontin
 Xylocaine

GENERIC NAME

Fluphenazine
 Sodium Oxacillin
 Dipyrone
 Quinidine Gluconate
 Reserpine
 Methylphenidate
 Vitamin B-12
 Secobarbital
 Senna fruit extract
 Selenium Sulfide
 Mesoridazine
 Reserpine
 Doxepine
 Trifluoperazine HCl
 Pseudoephedrine HCl
 Sulfacetamide
 Triple Sulfa
 Tetracycline HCl
 Dioctyl sulfosuccinate
 Fluocinolone Acedtonide
 Pentazocine
 Sodium Cloxacillin
 Carbamazepine
 Tetracycline
 Oxytetracycline
 Buffered Salt (NACl) Tablets
 Chlorpromazine HCl
 Tolnaftate
 Trimethobenzamide
 Imipramine HCl
 Diphenylhydantoin
 Desonide
 Acetaminophen
 Multivitamins
 Diazepam
 Potassium P Penicillin
 Potassium P Penicillin
 Doxycycline Hydate
 Betamethasone
 Tetrahydroxoline HCl
 Iodochlorhydroxyquin
 Hydroxyzine pamoate
 Ethosuxamide
 Lidocaine

Wang

V. 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 individual's 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 is for 25, 50, 100, 125, 200, or 500 mg, then you will likely see that the pharmacist has filled the prescription with a half a tablet or two tablets. This will depend upon the dose ordered and the weight of the normal tablet.

The following chart should cover most of the tablet orders you will see..

<u>weight of 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 come 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 a 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. pm - 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	overdose
ac	before meals	OD	right eye
ad lib	as desired	OS	left eye
bid	twice a day	os	mouth
B/P	blood pressure	OU	both eyes
c	with	oz	ounce
CAP	capsule	pc	after meals
cc	cubic centimeter	per	by means of
cm	centimeter	PM, pm	afternoon, evening
c/o	complained of	po, PO, per os	by mouth, orally
dr	dram	PRN, pm	when necessary
elix	elixir	pt	pint
GI	gastrointestinal	q	every
g, GM, gm	gram	qd	every day
gr	grain	q3h	every 3 hours
gtt, gtts	drop (s)	qid	four times a day
h, hr	hour	qod	every other day
hs, HS	at bedtime	qt	quart
	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
		WBC	white blood cell

ss = ONE HALF

I = ONE

II = TWO

III = THREE

V = FIVE

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.

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 effect 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
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
Topical	within 1 hour	(For local effects on skin, eye, ear)	Creams and ointments

throughout the body

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. All 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

Lotions

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.

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.

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

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.

does not, ask the staff nurse for further instructions and check your 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 a 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 (lurazepam), 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 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.

III. 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 an individual's body fluids.
- H. Pour medications into appropriate containers, **NOT** into your hand.

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 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 (ESLISA) 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.

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 29, 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. *Annals of 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 5: THE MEDICATION CYCLE

OBJECTIVES

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

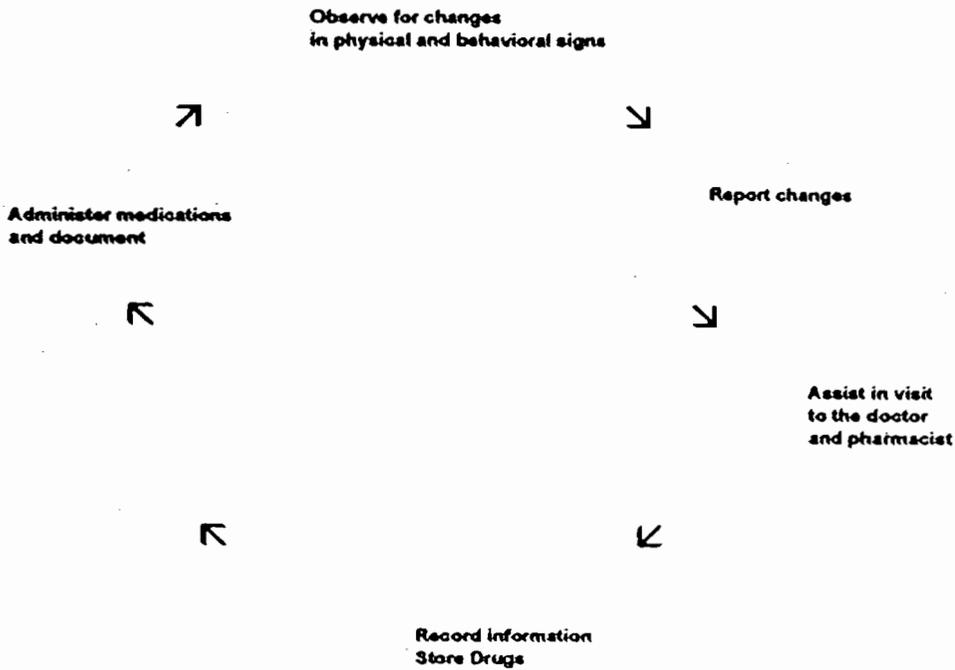
- 1) List the types of information which must accompany an individual when visiting a physician.
- 2) Discuss three (3) ways to encourage individuals to represent themselves when visiting a physician.
- 3) List the questions which must be asked of the physician and/or pharmacist when a new medication 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 electroshock 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 ^W
2. Difficulty breathing (dyspnea) ²⁻¹⁵
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

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 make call.
- one person stay with individual and administer 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 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.

IN-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.
- 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 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 individuals 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.

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

Report as soon as possible after the condition is observed.

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.

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
phenytoin 100 mg. #90
Take one (1) capsule three times a day

10/20/82

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

... 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.

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 individual 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.
5. 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.
6. 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 label 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 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

- A. Give the Right medication--compare the label on the medication container with the individual's medication sheet.
- B. 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.
- C. 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).
- D. Give medication by the Right route--compare the medication sheet and the label.
- E. 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.
- F. Right documentation--record medication after it is given.

Read. Absorb. to not forget.

THE 6 R's

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

Give your full attention to the task.

Remain with the individual until the medication has been taken.

Prepare medication for only one individual at a time.

Do not give a medication from a container which has a label that cannot be read.

Do not give a medication from another person's container.

Do not try to hide a medication error.

When 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 label and record and the 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 wound. Follow the route directions carefully.

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

Examples:

- 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.

<u>PROCEDURE</u>	<u>KEY POINTS</u>
1. Check medication record with drug label.	To ensure right individual, right medicine, right dose,
2. Assemble equipment: medication record, drinking glasses, straws, water, paper towels.	Equipment should be clean and dry.
3. Have individual come to designated area.	Individual's room or area where medication is kept.
4. Be sure individual washes hands before starting procedure.	Clean technique.
5. If able, have individual select proper container from shelf. If not able to identify the container, employee will	<u>"Rule of Three"</u> - read label three times: 1. Before removing container from medicine cabinet. 2. Before pouring drug dose 3. Before returning container to the medicine cabinet.
6. Watch individual open container and remove correct dosage using proper equipment (medicine cup or container cap to hand).	Helpful for individual if non-childproof caps are used.
7. Remain with individual until medication is taken.	
8. Record medication administration on proper documents.	<u>Or</u> observe individual complete the recording.
9. Observe individual for reaction.	

Remember, that through this procedure efforts should be directed to encouraging and giving the individual every opportunity to do as much as possible.

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

PROCEDURE

KEY POINTS

- | | |
|--|---|
| 1. Check medication record with pharmacy label. | To ensure right individual, right drug, right dose, right method, right time. |
| 2. Assemble equipment: medication, record, drinking glasses, straws, water, paper towel. | Work alone, prevent distractions or interruptions and have good lighting. |
| 3. Wash hands thoroughly before measure or preparing medication. | Maintain clean technique throughout procedure. |
| 4. Read medication record.

For each dose of medicine, read the label three times. | Minimize opportunity for error.

"Rule of Three"

1. Before removing container from medicine cabinet,
2. Before pouring the measured amount of drug, before replacing the container in the medicine cabinet. |
| 5. <i>TEST</i> Pour the accurate dose. | |

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 against the label | To avoid soiling or defacing label, always place bottle against palm of hand and wipe outside of bottle before returning bottle to storage site. |
| C. Hold medicine cup at every level with the thumbnail marking the desired dosage and read at lowest level of fluid surface. | |

Pour liquid medication directly into calibrated cup.

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

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.

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.

Administration of Poured Medications

A. Identify individual and medication. Read the information on medication record.

Make sure you give right medication to the right individual.

B. Explain the procedure to the individual.

Ensures cooperation and helps in teaching the individual.

C. Individual should be in upright position.

Facilitates swallowing.

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.

Check to see if individual has swallowed medication.

I. Observe individual for reaction.

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

Clean-up

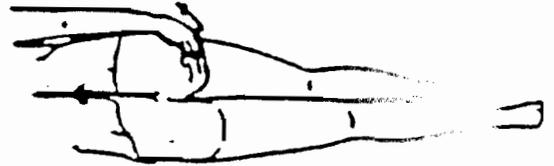
- A. Discard used medicine cups in a waste container.
- B. Wash hands. Washing hands between individuals is adequate to maintain clean technique.

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.



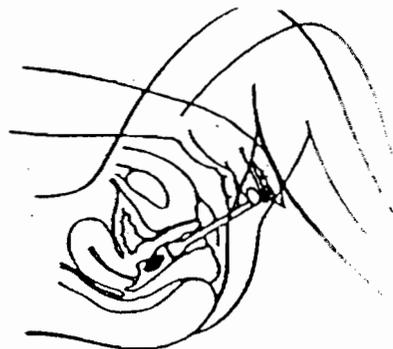
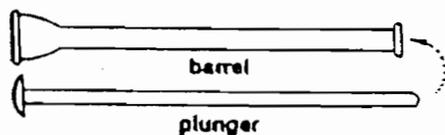
Procedure for the Administration of Vaginal Suppositories

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.

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 for 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 does.

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.

ADMINISTRATION RECORD

DA 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	30	
Dhenytoin 100mg. by mouth x daily	8A																															
	12N																															
	8p																															
Lithium 5mg. 1 mouth 2x daily	8A																															
	8p																															
Dhenytoin 100mg. by mouth x daily	8A																															
	8p																															
Benedryl 25 mg. 1 mouth every 6 hrs starting 7-29-93	P																															
	R																															
	N																															

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

INC **8** **7 JULY 1, 1993** THROUGH **7 JULY 31, 1993**
 NAME **Dr. S. Needles** TELEPHONE NO. **555-5555** MED. RECORD NO.
 HY. ALT. TELEPHONE
 SS **NKA** **Ⓞ** REHABILITATIVE POTENTIAL
 XSIS **M.R. / Bi-Polar Disorder**

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**.

Answer Self Test Questions - Lesson 6 Medication Administration

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 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.

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. ~~A~~ Your formulary.

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 small pictures of the product.
- f. Section 6. Product Information - lists the major products with information on action, uses, administration, dosages, contraindications and treatment.

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 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

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 drug (Senokot-S, Doxidan, Dialose-Plus, Pe 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 blood 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 (Macrochantin)
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 (Tenomin)
 - 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 (Temaryl)
 - 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.) *aspirin*
 - 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 *weak - out of let*
- 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 *Calcium in Kidney*

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, A, 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

ANTICONVULSANT

Dilantin
Eskabarb
Mysoline
Mebaral
Mesantoin
Valium
Zarontin

ANTACIDS

Gelusil
Maalox
Milk of Magnesia
Mylanta

ANTIDEPRESSANTS

Aventyl
Elavil
Tofranil

ANTHELMINTICS

Antepar
Antiminth
Povan
Vermox

ANTIDIABETIC AGENTS

DBI-TD
Diabinese
Tolinase

ANTIASTHMATICS AND BRONCHODILATOR

Brondecon
Bronkotabs and
Bronkolixir
Isuprel Compound Elixir
Marax
Organidin
Tedral

ANTIDIARRHEAL PREPARATIONS

Donnagel & Donnagel Pg
Kaopectate
Lomotil
Paregoric

ANTIBIOTIC and ANTIBACTERIALS

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

ANTIHISTAMINES

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

ANTIPYRETICS

Aspirin
APC Compound Tablets
Pyrilgin
Tylenol

TRANQUILIZERS and
SEDATIVES

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

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
Colymycin Otic Drops
Cortisporin Otic Drops
Debrox Otic Drops

STIMULANTS

Adrenalin
Dexedrine
Ritalin

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 a individual, your responsibilities are:

**FOLLOW LABEL DIRECTIONS
AND
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.

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 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 born 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:

- Hives
- Common Colds
- Nasal Allergies
- Medication Reactions
- Insect Bites

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.

*Non-Prescription Medication

Table 2.1

Antihistamines Medications

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
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 clients not to drink alcohol, driving, or other activities that require alertness
*chlorpiramine	Chlor-Trimeton	.	.	.	.	.
doxylamine	Phenergan	.	.	.	.	.
dimethazine	Dramamine	.	.	.	.	.
pheniramine	Bonine	.	.	.	.	.
meclizine	Antivert	.	.	.	.	.

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	Robitussin 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, fractures, 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	Sweating
Nausea	Restlessness

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 diabetic patients. Medication may increase blood sugar.
theophylline	Aminophylline	Rectal Suppository	Chronic Bronchitis, Emphysema			Aminophylline CNS stimulant widely used. Contraindicated in different classes of antidepressants. Caution in patients who are susceptible to "postural hypotension".
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 anti tubercular medications.

Table 2.4

Anti tubercular Agents

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
para-aminosalicylic acid	PAS	tablet	Tuberculosis	Nausea, vomiting, fever, skin rash	Give after meals to reduce gastric upset.	Supplies B ₆ and folic acid
isoniazid	INH			In addition to above some numbness in hands and feet		INH is a weak light

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

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, mucus 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
Lack of Energy

Change in Skin Color
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 reaction. 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 1 hour after or 2 hours before a meal
oxacillin	Bactocill	Capsules				
penicillin G, potassium G	Pfizerpen, K-Oxin-500, Penids	Tablets & Injections				
penicillin V, potassium	V-Ollin K, Veebids, 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 3.3)

**Table 3.3
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	Cefin	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 3.4 to determine side effects and your responsibilities when administering these agents.

**Table 3.4
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:

- Trichomonacides: Instruct individuals in douching.
- Teach methods of vaginal suppository insertion.
- Encourage individuals not to have sexual intercourse until infection is cleared.

Table 3.5 lists some common amebicides and trichomonacides.

Table 3.5

Amebicides and Trichomonacides

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications	Precautions
metronidazole	Flagyl	Tablets & Vaginal Suppository	Protozoal infection, Trichomoniasis	Nausea, Vomiting & topical skin irritations	Rare	Give with milk	or

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

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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 neck is rarely affected because the parasite grows in warm, moist areas.

For scabies or pubic lice

Directions: -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).

For head lice

Directions: -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 3.6).

Table 3.6
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 to chew Gelatin capsules as they have a very bitter taste.
thiabendazole	Mintezol	Tablet & Liquid	Hookworm, pinworms	Above symptoms plus confusion and drowsiness.		
oxyresorinol	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: 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</u> (beats per minute)
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 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	Contraindications
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, medication should be held. Notify nurse or physician.
procainamide hydrochloride	Pronestyl	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 medication 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, Pavavid	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.

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	Contraindications
hydralazine hydrochloride	Apresoline, Hydralazine	Tablet	Hypertension	Loss of appetite, headache, tachycardia, nausea, vomiting, diarrhea	Give with meals to increase absorption	Individuals who are dizzy when standing
clonidine reserpine methyldopa	Minipress Catapres Aldomet			Low pulse, rash, fever, fatigue		May cause dizziness

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	Contraindications
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. No supplement potassium
chlorothiazide	Diuril			eyes sensitive to sun light.		
hydrochlorothiazide	Hydrodiuril					
spironolactone	Aldactone	Tablet	Rid body of excess fluid and reduce blood pressure.			
furosemide	Lasix	Tablet & Injection				Consult with physician if patient has kidney or diabetes or high potassium

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 the 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, Penwarfin	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 time & the blood tests are done routinely when individuals are on anticoagulants. Have individual use electric razor, gum medication at same time each day.

Answer Self Test Questions - Lesson 10, Section 4
Medications that affect the Cardiovascular system

LESSON 10: MEDICATION CLASSIFICATION

SECTION 5. MEDICATIONS THAT AFFECT THE URINARY SYSTEM

OBJECTIVES

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

- 1) Define the classifications of medications which affect the urinary system.
- 2) Given a specific medication classification, list at least two (2) side effects.
- 3) State responsibilities other than observation for side effects, when administering medications in these classifications.

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

RELATED INFORMATION

The urinary system is also referred to as the excretory system. As the name implies, the organs of this system produce urine (liquid waste) which is excreted from the body. The urinary system also helps to control the vital water and salt balance of the body. The organs of this system include: the kidneys, ureters, urinary bladder and urethra.

SULFONAMIDES

The sulfonamides were the first medications developed to combat infection. Antibiotics eventually replaced sulfonamides for general infections. However, Sulfonamides remains the medication of choice for urinary tract infections.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING SULFONAMIDES

Increase fluid intake up to two quarts per day and avoid foods high in calcium.

Side effects to watch for are:

- Nausea
- Vomiting
- Diarrhea
- Blood in Urine
- Skin Rash

Please review Table 5.1 for additional information on sulfonamides.

Table 5.1
Sulfonamides

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
sulfisoxazole	Gantain	Tablet	Urinary Tract Infection	Nausea, vomiting, diarrhea, urinary tract stones, serious skin rash, blood in urine, sensitivity to sun light.	Avoid over use of calcium rich foods.	Increase fluid intake up to two quarts per day to help with stone formation.

URINARY ANTISEPTICS

These medications are used to treat urinary tract infections. Many people who have had a urinary tract infection have recurrences following a period without symptoms. For this reason, they are often placed on long-term medication therapy. Most of the sulfonamides, as well as some systemic antibiotics such as the erythromycins, may be used to treat these conditions.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING URINARY ANTISEPTICS

Some urinary antiseptics will change the color of the urine. Inform the individual that this may occur. Also, many of these medications may cause stomach upset, therefore they should be administered with meals or food whenever possible. Some medications work best when the urine is strongly acid or basic; so depending on the medication it may be necessary to either encourage or discourage fluids and foods high in acid. Your responsibilities include:

- Inform individual of color change in urine;
- Encourage fluid intake - 1-2 quarts/day;
- Find out if acid or base medium is desired

OTHER DRUGS WHICH EFFECT THE URINARY SYSTEM

Urinary tract infections may be painful. Pyridium is an analgesic (reduces pain) and may be combined with various urinary antiseptics or used alone. The prefix AZO means that pyridium has been added, i.e., AZO mandelamine. Review Table 5.2 for specific urinary antiseptics. Certain illnesses, and sometimes advancing age, cause the bladder function to become sluggish.

Urecholine is an oral medication used to relieve urinary retention. Side effects include:

Cramping
Diarrhea
Headache

TABLE 5.2
Urinary Antiseptics

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
nitrofurantoin	Furadantin, Macrochantin	Tablet	Most Urinary tract infections	nausea, vomiting, diarrhea, loss of appetite	Encourage acidic fruit juices, particularly cranberry juice.	Give with milk. reduce stomach upset, alert the individual that urine color may turn dark brown.
ibidic acid	NoGram		Gram positive and gram negative bacteria.	Skin rash, blood dyscrasias, blurred vision		May cause false positive dipstick test for sugar in urine.
phenazopyridine hydrochloride (AZO)	Pyridium		Relieves pain associated with urinary tract infection	Ringin in ears, nausea, vomiting	Give with food or milk.	Turns urine red-orange.
sulfamethoxazole-trimethoprim	Bactrim Septra	Tablet & Liquid	Chronic urinary tract infections	sore throat, fever	Take 1 or 2 hrs. before meals for best absorption	Oral suspension available for those who cannot swallow large pills.

LESSON 10: MEDICATION CLASSIFICATIONS

SECTION 6. MEDICATIONS THAT AFFECT THE NERVOUS SYSTEM

OBJECTIVES

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

- 1) Define the classifications of medications which affect the nervous system
- 2) Given a specific medication classification, list at least three (3) side effects.
- 3) State responsibilities, other than observation for side effects, when administering medication in these classifications.
- 4) List three (3) measures other than medications which can be used to calm a individual.
- 5) Define epilepsy.
- 6) Describe observations to make when a seizure occurs.
- 7) List two (2) medications used to treat extra pyramidal symptoms.

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

CENTRAL NERVOUS SYSTEM STIMULANTS - Medications which increase central nervous system functions.

Sub-Classifications:

AMPHETAMINE & CAFFEINE - Increase mental and physical activity.

CHOLINERGIC BLOCKING MEDICATIONS - Block or stop symptoms associated with Parkinson's Disease and side effects of anti psychotic.

CENTRAL NERVOUS SYSTEM DEPRESSANTS - Medications which decrease central nervous system functions.

SEDATIVE - HYPNOTIC MEDICATIONS - Induce sleep and calm the body.

ANALGESIC MEDICATIONS - Relieve pain

NARCOTIC MEDICATIONS - Relieve severe pain.

NON-NARCOTIC MEDICATIONS - Relieve mild-moderate pain.

ANTI-INFLAMMATORY MEDICATIONS - Relieve pain due to inflammation.

ANTIPYRETIC MEDICATIONS - Reduce body temperature.

PSYCHOTROPIC MEDICATIONS - Used to treat a variety of emotional disorders.

ANTI ANXIETY MEDICATIONS - Used to treat mild to moderate states of emotional upset.

ANTI PSYCHOTIC MEDICATIONS - Used to treat aggressive and agitated behavior.

ANTIDEPRESSANT MEDICATIONS - Used to relieve depression

ANTICONVULSANT MEDICATIONS - Used to control seizures.

RELATED INFORMATION

The nervous system controls and coordinates all voluntary and involuntary body activities, even the production of hormones. Sensory receptors of the nervous system, such as the eye and ear, enable us to be aware of our surroundings. Special parts of the nervous system are concerned with maintaining normal day-to-day functions while other parts act during emergency situations and others control voluntary activities.

NERVES

Many small cells are bunched together to form nerves. Sensory nerves carry sensations to the brain and spinal cord. Feeling is lost when these nerve impulses are interrupted. Motor nerves carry impulses that cause body activity. Paralysis (loss of function) occurs when these nerves are damaged.

For easier understanding, the nervous system can be divided. Remember, though, that the nervous system is one interwoven system, and if one part of it is affected, all of it is affected.

THE CENTRAL NERVOUS SYSTEM

The term central nervous system (C.N.S.) refers to the brain and spinal cord.

BRAIN

All mental activities, such as thinking, voluntary movements, interpreting sensations and emotions are carried out by brain cells. In general, the right side of the brain controls the left side of the body and vice versa.

SPINAL CORD

The spinal cord is a continuation of the brain and it is about 17 inches long, ending just above the small of the back. Nerves extend from the brain and spinal cord throughout the body.

AUTONOMIC NERVOUS SYSTEM (A.N.S.)

The autonomic nervous system is concerned with involuntary body activities. It is made up of two parts called the sympathetic and parasympathetic systems. The center of control is in the brain stem. Nerve fibers which carry impulses to control the usual functions of heartbeat, digestion, elimination, respiration, and glandular activity are called parasympathetic.

In times of stress or danger, the heart beats faster, the lungs work harder, and certain glands increase their production. Blood pressure is increased as the body prepares for action. These activities are brought about by stimulation of the sympathetic system.

SENSORY RECEPTORS

These are the nerve endings found in the skin, joints, nose, mouth, ears, and eyes. All of these structures help relay information to the brain.

MEDICATIONS THAT AFFECT THE CENTRAL NERVOUS SYSTEM (C.N.S.)

In general, the medications that act on the C.N.S. may be divided into two groups: those that stimulate and those that depress its functions.

CENTRAL NERVOUS SYSTEM STIMULANTS

Medications which stimulate the C.N.S. These stimulants speed up all body functions they:

increase	sharpness of sensation and perception
increase	body activity
increase	alertness and concentration
suppress	fatigue and inhibit sleep

C.N.S. stimulants are used for a variety of physical and mental problems. For example, many people start their day with a cup of coffee or tea. Both of these liquids contain caffeine which is a mild C.N.S. stimulant. During the course of a day when one becomes tired, one will have a cup of coffee or tea which "perks" one up. On the other hand, some people who have coffee late at night can't get to sleep.

In addition to caffeine being present in coffee, tea, chocolate and cola sodas, it is available as a medication. The side effects to be aware of include:

- inability to sleep (insomnia)
- restlessness - nervousness
- increased heart rate

Caffeine should be avoided by people who have stomach ulcers because it is irritating to the lining of the stomach.

AMPHETAMINES

The amphetamines are C.N.S. stimulants. They have the disadvantage of producing tolerance and medication dependency. Therefore, the dosage must continuously be increased in order to achieve the same effect.

The amphetamines stimulate the C.N.S. to increase:

Mental and Motor Activity

Amphetamines are occasionally used in the treatment of depression, however, more often used to treat hyper kinetic children. This may be confusing to you as you might wonder why a stimulant would be given to someone who is already overactive. It is not known why amphetamines calm a hyper kinetic child, but it is known that when an individual is hyper kinetic, amphetamines will calm him down.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING AMPHETAMINES

These medications have many side effects in addition to being habit-forming. They are medications which, when stopped, can cause severe depression.

Common side effects are:

- Loss of Appetite
- Dry Mouth
- Fast Heartbeat
- High Blood Pressure
- Restlessness
- Inability to sleep

Amphetamines are also the base of many diet medications. However, because of dependency and side effects, they are not used for weight loss as much as they were in the past. Review Table 6.1 for common C.N.S. stimulants.

Table 6.1
Central Nervous System Stimulants

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
amphetamine sulfite	Benzedrine	Tablet	Narcolepsy disease where people fall asleep through out the day.	Restlessness, dry mouth, loss of appetite, high blood pressure	Should not be given to	
dextroamphetamine sulfate	Dexadrine		weight loss		Avoid caffeine drinks, as caffeine will make these medications stronger.	
methylphenidate	Ritalin		Hyperkinetic children			

There will be more discussion of C.N.S. stimulants when we describe psychotropic medications, which are medications used for mental disturbances.

CENTRAL NERVOUS SYSTEM DEPRESSANTS (C.N.S.)

C.N.S. depressants have the opposite effects of the stimulants. They decrease the central nervous system's activity:

- decrease sharpness of sensation and perception of stimuli and lessens or slows body activity;
- decreases alertness and concentration;
- promotes drowsiness and sleep.

There are various sub-classifications of C.N.S. depressants. However, regardless of the sub-classifications, it is important to remember that they work by depressing activity.

SEDATIVE-HYPNOTIC MEDICATIONS

Though these terms are often used interchangeably, there is a difference in them. A hypnotic is a medication used to provide sleep, whereas a sedative quiets and relaxes a person without producing sleep. However, due to the fact that a person who is relaxed is likely to go to sleep, hypnotics and sedatives will be described together.

There are two major classes of sedative hypnotic medications known as barbiturates and non-barbiturates. The non-barbiturates were developed in an effort to produce a sedative-hypnotic which did not have adverse effects (e.g., addiction) associated with the barbiturates. So far this goal has not been achieved. In general, both the non-barbiturates and barbiturates produced the same activity.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING SEDATIVES AND HYPNOTICS

The side effects associated with the sedative-hypnotic medications are an extension of their therapeutic action.

drowsiness	lethargy
dry mouth	poor balance

These side effects can be collectively referred to as "hangover symptoms." Elderly individuals are particularly sensitive to side effects, especially loss of memory.

A major caution with these medications is the possibility of addiction. Prolonged use of sedative-hypnotics may result in increased tolerance and physical dependence. If this develops the medication must be used continuously to avoid the onset of withdrawal symptoms.

When possible it is best for individuals to sleep without sedation. At times you may be able to calm and help a individual relax without medication. Some measures include providing a quiet environment; glass of warm milk, and reassurance.

There are many medication interactions associated with sedative hypnotic agent. They potentiate the actions of other depressant medications, leading to greater C.N.S. depression, low blood pressure and muscle relaxation. Some medication classifications which interact with sedatives and hypnotics are:

- antihypertensives
- antihistamines
- tranquilizers
- alcohol

Alcohol is a depressant and should never be used with sedative hypnotics, as the combination of the two may lead to serious depression of the C.N.S.

Sedative-hypnotics reduce the effectiveness of anticoagulants and oral contraceptives

Because of these numerous medication interactions, as with all medications, it is important to let the physician know what medications the individual is taking.

Life threatening side effects may occur. These include:

- slurred speech
- tremors
- depressed respiration's

If you observe any of these side effects, it is very important to notify the physician or nurse and not give the medication until further directed. Table 6.2 describes some common sedatives and hypnotics.

TABLE 6.2
SEDATIVE AND HYPNOTIC MEDICATIONS

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	
Barbiturates	Luminal	Tablet	Induces and maintain sleep	Drowsiness, dry mouth, lethargy, hang over effect.	Will increase action of anti-hypertensives, antihistamines, tranquilizers, alcohol	Major side effects can be fatal
phenobarbital (also used as an anticonvulsant)						
pentobarbital	Nembutal					
amobarbital	Amytal					
secobarbital	Seconal					
Non-Barbiturates						
chloral hydrate	Noctec					
glutethimide	Doriden					
flurazepam	Dalmane					Can be fatal if overdosed

ANALGESIC (C.N.S. DEPRESSANTS)

Pain primarily functions as a protective signal. Pain may warn the individual of imminent danger (fire) or the presence of internal disease (appendicitis, tumors). Relief from pain is desired when the intensity or duration of pain interferes with a person's ability to function in the activities of daily living. Analgesics are medications which relieve pain.

There are two major sub-classes of analgesics:

- narcotic (strong analgesics)
- non-narcotic (mild analgesics)

NARCOTIC ANALGESICS

Narcotic analgesics are capable of altering or relieving severe pain and are primarily used to relieve pain of trauma, such as a broken leg, a heart attack, terminal illness and pain associated with surgery.

Narcotics are controlled substances and are placed in Schedule II of the Controlled Substance Act. You may wish to review the section on Care of Controlled Substances.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING NARCOTICS

Narcotics are derived from opium or synthetic preparation. Morphine sulfate is the strongest narcotic and is an opium preparation. Demerol is synthetic (man-made) and is almost as strong as morphine. Narcotics have some common side effects: slow respirations, nausea, vomiting, constipation, sweating (diaphoresis).

Before these medications are given, the respiratory rate should be checked for 1 full minute. If respirations are below 12 breaths per minute, the medication should not be given. If you are observing an individual on narcotics, your responsibility is to check the RESPIRATORY RATE FREQUENTLY. Please see Table 6.3.

**TABLE 6.3
NARCOTIC ANALGESICS**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
morphine sulfate (opium derivative)	Sama	Tablet & Injection	Severe pain	Decreased respiration's, sweating nausea, vomiting, constipation.- In addition to above dizziness.	Will increase activity of all CNS depressants	Respiration's are checked before giving and while individual is on medication.
meperidine hydrochloride (synthetic)	Demerol					In general synthetic preparations have the same side effects but are less severe than opium derivatives. Give with milk or food
oxycodone hydrochloride (synthetic)	Percodan	Tablet				
periazocaine hydrochloride (synthetic)	Peroacet					
codeine sulfate (opium derivative)	Talwin HCL	Tablet & Injection				Same as morphine
	Sama		Analgesic and antitussive-they are part of may cough syrups			Analgesic and antitussive
propoxyphene hydrochloride (synthetic)	Darvon, Darvon compound, Darvocet					NOTE: LIMIT ALCOHOL WITH ALL CENTRAL NERVOUS SYSTEM DEPRESSANTS

NON-NARCOTIC ANALGESICS (MILD ANALGESICS)

Mild Analgesics
Antipyretics
Anti-Inflammatory

Mild analgesics relieve mild to moderate pain without altering consciousness or mental function. In particular these medications relieve pain associated with inflammation (arthritis and gout) and dull aches (headaches and muscle aches).

Antipyretics are medications which reduce fever.

Anti-Inflammatory are medications which reduce pain associated with inflammation.

One medication which can function in all three of these sub-classes is aspirin (acetylsalicylic acid). Aspirin is one of the most commonly used medications in the world. Salicylate is the base of aspirin and is a common preparation found in other medications.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING MILD ANALGESICS AND ANTIPYRETICS

In low doses these medications relieve pain, aches and fever. However, in order to relieve the severe pain associated with arthritis and gout, the medications are administered in larger doses for longer periods of time. Large dose therapy is more frequently associated with causing side effects. The three most common side effects are:

ringing in the ears (tinnitus)
nausea

headache

There is always the possibility of an allergic response and if you observe signs of this you must notify the doctor or nurse as soon as possible.

Salicylate based medications are irritating to the stomach lining and should be administered with milk or after meals which helps decrease stomach irritation.

TABLE 6.4
MILD ANALGESICS

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
*acetylsalicylic acid	Aspirin, Empirin, Anacin	Tablet, Liquid & suppositories	Analgesic, antipyretic, anti-inflammatory	ringing in ears, nausea, vomiting, diarrhea	Give with milk to reduce gastric irritation. Increase effectiveness of anti-coagulants	Should not be used in children with viral infections
*acetaminophen	Tylenol, Datril		Analgesic, antipyretic	Drowsiness		Used for pain relief when aspirin cannot be used

ANTI-INFLAMMATORY NON-STEROID MEDICATIONS

Anti-inflammatory medications are used primarily to relieve inflammation of one or more joints which accompanies problems such as arthritis, gout and bursitis.

Review Table 6.5 for specific information on anti-inflammatory medications. As you will note, side effects are similar to the salicylates.

TABLE 6.5

ANTI-INFLAMMATORY AGENTS (NON-STEROID)

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
ibuprofen	Motrin	Tablet	Rheumatoid arthritis, and Osteoarthritis	gastric upset, nausea, vomiting, constipation and/or diarrhea	Give with meals and milk to reduce gastric upset.	A non-steroid anti-inflammatory
phenylbutazone	Butazolidin		Arthritis, gout		Avoid antacids with high salt content.	Should not be given individuals with a history gastric ulcers.
indomethacin	Indocin			As above, plus: dizziness, depression, mental confusion.		

*MOTRIN IS ALSO USED FOR PAIN ASSOCIATED WITH MENSTRUATION

ANTI-ANXIETY MEDICATIONS

Anxiety, tension, and nervousness are symptoms caused by situations which are interpreted as being threatening or dangerous. These psychological (mental) conflicts can cause physiological (body) changes, such as trembling, sweating, nausea and increased heart rate. Most people, at some time in their lives, have experienced these uncomfortable feelings. When the cause of the conflict is removed, the body returns to a more relaxed state (autonomic nervous system controls this state). However, if for some reason the source of anxiety continues, the individual may develop a neurosis which is defined as an "accumulation of anxiety and tension." Neurosis falls under the term "mental illness", which is a broad title covering a number of emotion disturbances involving changes in personality and behavior. Psychosis, defined as a "loss of contact with reality", is also a form of mental illness. In general, psychosis or psychotic state is more severe than a neurosis or a neurotic state.

Psychotropics is a term used to cover a broad range of medications. These medications are commonly referred to as tranquilizers and the two terms are used interchangeably. Psychotropics do not cure emotional disorders, but they do help to relieve anxiety, aggressive behavior, and depression. Once these symptoms are relieved, a person is more receptive to other forms of treatment.

Anti-anxiety medications are used to treat mild to moderate states of emotional upset. These agents are widely used – sometimes for extended periods of time.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTI-ANXIETY MEDICATIONS

The actions of anti-anxiety medications resemble those of barbiturates but cause less drowsiness and confusion. Some of these medications are also used for their anticonvulsant properties and will be discussed later in this section.

All of these medications can cause mental and physical dependence. Because of this dependence, whenever these medications are discontinued it should be done on a gradual basis in order to prevent withdrawal symptoms.

Side effects which may occur will resemble those of many C.N.S. depressants, drowsiness, dizziness and constipation. In addition to these symptoms, others which may occur include:

- allergic reactions
- nausea/vomiting
- low blood pressure
- slurred speech

Nausea and/or vomiting can be reduced if these medications are given with or after meals.

See Table 6.6 for the more common anti-anxiety medications.

**TABLE 6.6
ANTI-ANXIETY MEDICATIONS**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
chlordiazepoxide hydrochloride	Librium	Tablet & Injection	Reduces anxiety and promotes a feeling of relaxation	Drowsiness, fatigue, nausea, constipation, confusion, excitement, slurred speech	Will increase the effectiveness of antihypertensives and all other CNS depressants including analgesics.	All of the above can cause drowsiness
diazepam	Valium		Also used for mild depressant and to relax muscles.			Use with caution in individuals developing tolerance
oxazepam	Serax	Tablet				
chlorazepate	Tranxene					

NOTE: THE INDIVIDUAL SHOULD NEVER MIX ALCOHOL WITH THESE MEDICATIONS

ANTI PSYCHOTIC MEDICATIONS

Anti psychotic medications are used for the treatment of aggressive and agitated behavior. These medications are stronger than the minor tranquilizers so, in addition to some of the common side effects of C.N.S. depressants and mild tranquilizers, there are more severe side effects which may occur.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTI PSYCHOTIC MEDICATIONS

Major tranquilizers are effective across a wide range of dosages. The dosage is usually increased gradually over a period of seven to fourteen days or until symptoms are controlled or side effects occur. Due to the physical and mental dependence on these medications, they should not be stopped abruptly because withdrawal symptoms may occur.

The major (severe) side effects which occur are grouped together and called extra pyramidal symptoms (EPS). These symptoms collectively are uncontrollable muscle spasms and can be broken down to: tremors of hands and feet, shuffling walk, body rigidity, restlessness.

Extra pyramidal symptoms, for the most part, can be stopped by discontinuing the anti psychotics or if these medications can't be stopped, other medications may be used to treat these symptoms.

However, if these symptoms (EPS) are not corrected, the person can progress to Tardive Dyskinesia which is a combination of EPS and more severe, irreversible side effects. The most visible sign is around the mouth and jaws. The tongue has a snake like movement, jutting in and out. In addition, there are some internal changes which are life threatening. The liver and circulatory systems are prime areas for destruction. Visible signs of this damage may be:

liver damage - yellow color to the eyes and skin (jaundice)

circulatory damage - blood disorder (dyscrasia)

A blood dyscrasia is either abnormal blood cell formation or absence of adequate production. The initial signs of a blood dyscrasia resemble those of a common cold: a tired, aching feeling, sore throat, fever and swollen glands in the neck.

If these signs appear and are due to a blood dyscrasia, the person needs immediate medical attention. Fortunately, most people who are on long-term anti psychotic medications also have blood tests done on a regular basis. This helps to monitor any early liver and blood destruction which may be occurring.

It has also been noted that individuals taking the anti psychotics develop a sensitivity to sunlight. As much as possible, these people should avoid excessive exposure to sunlight and be encouraged to use a good sunscreen.

Table 6.7 will supply you with additional information on specific anti psychotics.

**TABLE 6.7
ANTI PSYCHOTIC MEDICATIONS**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions
chlorpromazine	Thorazine	Tablets, liquids & suppositories	Restoration of emotional calm, relief of severe anxiety, agitation, and psychotic behavior.	Drowsiness, allergic reaction, dry mouth, constipation, and low blood pressure.	Will increase effectiveness of CNS depressants.
trifluoperazine	Vesprin	Tablet			
thioridazine	Mellaril	Tablet & liquid		More severe side effects are: extra pyramidal symptoms and Tardive-Dyskinesia	
haloperidol	Haldol			-	
mesoridazine	Sereniti			-	
fluphenazine	Prolixin			-	
thiothixene	Navane	Tablet			
molindone	Moban			-	

NOTE: SOME OF THE ABOVE MEDICATIONS ARE AVAILABLE IN A CONCENTRATED FORM WHICH IS A LIQUID.

CONCENTRATES ARE VERY HIGH DOSES IN SMALL AMOUNTS, AND SHOULD NOT BE ADMINISTERED BY PARAPROFESSIONALS.

ANTIDEPRESSANTS

Mental depression is a common disturbance that affects most people at one time or another. During depression there are noticeable changes in mood and behavior, along with feelings of frustration and hopelessness. Decreased appetite and insomnia are also common symptoms of depression. The depressed individual appears unable to cope with demands or stresses of living. In severe depression, the thought of suicide may be an acceptable solution. Early recognition and treatment is essential for prevention of the serious consequences of depression. There are three (3) major types of depression.

REACTIVE DEPRESSION

Caused by external factors (death, divorce, illness, change of environment and unemployment). This type of depression is time limited and may not require medication.

INTERNAL DEPRESSION

It is difficult to determine the cause of this depression. It may be intermittent or constant. Internal depression almost always requires medication.

MANIC DEPRESSION

Individual has alternating periods of elation and depression and is almost always treated with a specific medication called Lithium. (See next page)

Several different types of medications are available and they are generally referred to as antidepressants or mood elevators. However, they have an interesting action in that they may stimulate or depress the central nervous system. Therefore, they relieve depression and also relieve anxiety.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTIDEPRESSANTS

The most common sub-classification of antidepressants used are the tricyclic antidepressants which relieve depression and insomnia that accompany a depressed condition.

The side effects:

- dry mouth
- constipation
- low blood pressure
- drowsiness

Review Table 6.8 for additional information on the tricyclic medications.

TABLE 6.8
TRICYCLIC ANTIDEPRESSANT AGENTS

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions
imipramine hydrochloride	Tofranil Preserline	Tablet	Depression, gradual improvement of mood and relief of emotional depression	Dry mouth, constipation, urinary retention, low blood pressure, drowsiness	Interactions will occur with most other medications affecting the nervous system.
amitriptyline	Elavil, Endep	-	-	-	-
doxepin hydrochloride	Sinequan, Adepin	-	-	-	-
desipramine hydrochloride	Pertofrane, Norpramin	-	-	-	-
nortriptyline	Aventyl	-	-	-	-
protriptyline	Vivactil	-	-	-	-

MONAMINE OXIDIZE INHIBITORS (MAO¹ ANTIDEPRESSANTS)

These medications are not as common as the tricyclic antidepressants. However, under rare circumstances you may have to administer one of these medications. Some significant points to remember with these medications are the Food/Medication Interactions. Foods rich in tyramine (wine, cheese, beer and canned fish) are restricted.

LITHIUM (Anti-Manic Drug)

Lithium is a drug which is used to treat people who have been diagnosed as having a particular mental disturbance known as manic-depressive behaviors. Lithium is highly individualized and there will be specific directions to follow when administering this medication. Also, individuals who take Lithium need to have routine blood tests, which helps the physician monitor the dosage of Lithium. Avoid situations of severe sweating if taking this drug. May result in toxicity. It is important to maintain adequate salt intake and fluid intake.

EPILEPSY & ANTICONVULSANT MEDICATIONS

Epilepsy means a tendency to have recurrent seizures. The seizures are not always accompanied by convulsions, but most do involve a temporary interruption of consciousness. The seizures reflect a sudden unruly pattern of brain waves which is manifested in several ways. An individual with epilepsy may always have the same type of seizure or he may experience a variety of types. An aura or warning is experienced by about 50% of individuals with epilepsy.

The aura is an ill-defined sensation experienced through one of the following senses:

Sight changes - seeing spots in front of one's eyes or a blinding light.

Taste - especially a bitter taste in the mouth.

Hearing - hearing a strange noise.

Smelling - smelling a distinctive odor.

There are three (3) major types of epilepsy. They are:

1. Generalized Tonic-clonic (grand mal)
 - a. aura
 - b. loss of consciousness
 - c. "tonic" phase - spasm of muscles
 - d. "clonic" phase - alternate contraction and relaxation of muscles
 - e. individual sometimes voids involuntarily during convulsion
 - f. individual has no recollection of attack
 - g. often followed by headache and exhaustion and frequently sleeps for several hours

2. Generalized Absence (petit mal)
 - a. brief interruption of consciousness
 - b. sometimes accompanied by twitching of head, eyes or hand
 - c. sometimes seizures are so brief that they go unnoticed
 - d. more common among children than adults

3. Complex-partial (temporal lobe or psychomotor)
 - a. autonomic, purposeless movements that may seem voluntary
 - b. perceptual distortion, e.g., hallucinations
 - c. emotional experience, e.g., sudden intense fear or elation
 - d. memory distortions
 - e. may show stereotyped behavior that is inappropriate for the situation
 - f. individual is not aware of his action--will not remember them

The names in parenthesis had been in use for many years until new understanding brought about new terminology. It will be helpful for you to be familiar with both names, as people tend to use both the old and new names.

CARE OF INDIVIDUAL DURING A SEIZURE

When an individual has a seizure, the biggest danger faced is injury during the fall or during the clonic phase of the seizure. It is your responsibility to protect the individual from injuring him or herself: loosen any constrictive clothing such as a tie or belt; do not try to constrict the movements of the individual during the seizure as it may result in injuring the individual or yourself; do not try to put anything such as a spoon or tongue blade into the mouth of the individual - he cannot swallow his tongue. If he should develop breathing difficulty, attempt to put him on his side so the tongue blocking the airway is moved forward. Above all, never leave an individual alone during a seizure.

OBSERVATIONS TO REPORT AN RECORD

- if any aura was experience, if there was a loss of consciousness.
- the way the individual fell (direction), time and length of seizure.
- the parts of the body involved, movement of eyes.
- skin color, respiration rate, incontinence if any.
- type of muscle response (tonic or clonic), any injury that occurred.
- how the individual was after the seizure.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTICONVULSANTS

The anticonvulsant agents are used for the control of chronic seizures, involuntary muscle spasms or movements characteristic of certain neurological diseases. They are most frequently used in the treatment of epilepsy. Therapeutic agents cannot cure these convulsive disorders, but are used to control seizures without impairing the normal functions of the C.N.S.

Since there are many types of epilepsy, some medications are designed to control all types, while others are more individualized. Barbiturates and tranquilizers are effective anticonvulsants and may be used alone or in conjunction with other anticonvulsants.

Anticonvulsant therapy begins with a small dose of medication which is then increased until either the seizures disappear or medication toxicity occurs. If one medication decreases the frequency of seizures, but does not completely prevent them, a second medication may be added. For example, Phenobarbital, a barbiturate, is sometimes given with phenytoin (anticonvulsant). When you administer anticonvulsants, your responsibilities include observing for possible side effects:

- dizziness
- visual disturbances
- skin rash
- increased hair growth
- gum overgrowth (gum hyperplasia)
- gastric distress

The increased hair growth is most visible on the upper lip and about the face in the female individual. This is not a harmful side effect and there is little that can be done to prevent it. However, good oral hygiene will help prevent gum overgrowth and subsequent dental problems.

Gastric distress can be minimized by giving large amounts of fluid or giving the medication after a meal.

Table 6.9 list some common anticonvulsants you may use in your agency.

TABLE 6.9
ANTICONVULSANT AGENTS (ANTI EPILEPTIC AGENTS)

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
Barbiturates phenobarbital Mephobarbital (Controlled substance)	Luminal, Mebaral	Tablet, & liquid	Control of seizures	Drowsiness, dizziness, visual disturbance, skin rash, increase hair growth about the face.	Give after meals to reduce gastric upset.	Also may cause folic acid deficiency. <u>Symptoms:</u> <u>folic acid deficiency:</u> So mouth, diarrhea, ment confusion <u>Source of folic acid:</u> Fruit liver, vegetables
phenytoin	Dilantin			Gum overgrowth, gastric upset, fever headache		Good oral hygiene will be gum overgrowth.
valproic acid	Depakene			Nausea, vomiting, indigestion, diarrhea or constipation		
clonazepam	Clonopin	Tablet				
carbamazepine	Tegretol					
ethosuximide	Zarontin					
trimethadione	Tridione					

MEDICATIONS BY CLASSIFICATION

A. Anti anxiety drugs (minor tranquilizers)

1. Action—relieve anxiety and tension
2. Uses—central nervous system depressant, skeletal muscle relaxant, anticonvulsant
3. Examples
 - a. Chlordiazepoxide HCl (Librium)
 - b. clorazepate dipotassium (Tranzene)
 - c. diazepam (Valium)
 - d. lorazepam (Ativan)
4. Adverse effects
 - a. Hypotension
 - b. Slurred speech
 - c. Tachycardia
 - d. Impaired reflexes
 - e. Loss of mental activity
 - f. Drowsiness
5. Special considerations
 - a. Possibility of abuse or addiction occurring
 - b. Warning individual to avoid combining drug with alcohol or other depressants

B. Antidepressants

1. Tricyclic
 - a. Action—increase the transmitters norepinephrine or serotonin
 - b. Use—treat depression
 - c. Examples
 - i. amitriptyline HCl (Elavil)
 - ii. doxepin HCl (Sinequan)
 - iii. imipramine HCl (Tofranil)
 - d. Adverse effects
 - i. Orthostatic hypotension
 - ii. Constipation
 - iii. Dry mouth
 - iv. Blood disorders
 - v. Tinnitus
 - vi. Confusion
 - vii. Nightmares
 - viii. Hallucinations
 - ix. Restlessness
 - x. Increased risk of suicide

- e. Special consideration—drug must be given for one to four weeks before an effect is noticed
2. **Monamine Oxidase Inhibitors (MAO)**
- a. Action—decrease the amount of norepinephrine destroyed by metabolism and permits the level to increase in the brain
 - b. Use—treat depression
 - c. Examples
 - i. phenelzine sulfate (Nardil)
 - ii. isocarboxazid (Marplan)
 - iii. tranylcypromine sulfate (Pamate)
 - d. Adverse effects
 - i. Muscle tremors
 - ii. Heart irregularities
 - iii. Diarrhea
 - iv. Sweating
 - v. Constipation
 - e. Special consideration—to prevent a hypertensive crisis when taking MAO inhibitors, avoid foods that contain high amounts of tyramine such as cheese, fish, liver, baked potatoes, yogurt, beer, wine.

C. **Antipsychotics (major tranquilizers)**

- 1. Action—blocks the neurotransmitter dopamine or affects the metabolism of serotonin
- 2. Uses—control nausea and vomiting, agitation in organic brain syndrome; symptoms of psychoses
- 3. Examples
 - a. chlorpromazine (Thorazine)
 - b. haloperidol (Haldol)
 - c. thioridazine (Mellaril)
 - d. thiothixene (Navane)
 - e. trifluoperazine HCL (Stelazine)
- 4. Adverse effects
 - a. Abnormal movement of the tongue
 - b. Involuntary muscle contractions that cause bizarre, uncontrolled movements of the face, neck, tongue, and back.
 - c. Akinesia
 - d. Akathisia
 - e. Dyskinesia
 - f. Tardive dyskinesia
 - g. Urinary retention
 - h. Respiratory distress
 - i. Hypo/hyperglycemia
 - j. Hypotension

5. Special considerations
 - a. The most effective way to treat adverse effects (especially tardive dyskinesia) is to prevent it from occurring.
 - b. Do not combine tranquilizers with alcohol.
 - c. Some adverse effects are irreversible and life threatening, individuals on strong tranquilizers should be watched closely.

D. Anti-Manics

1. Action--alters chemical transmitters in the central nervous system
2. Use--prevent mood swings of manic-depressive illness
3. Example--lithium carbonate (Carbolith, Lithotabs)
4. Adverse effects
 - a. Tremors
 - b. Thirst
 - c. Drowsiness

ADDITIONAL INFORMATION CONCERNING PSYCHOTHERAPEUTIC DRUGS

- A. Encourage the individual to drink fluids.
- B. Provide for the individual's safety.
- C. Observe the individual for tremors, convulsions, or insomnia.
- D. Provide the individual with a calm environment.
- E. Help reorient the individual as needed.
- F. Chart and report accurately:
 1. Recent memory loss
 2. Abrupt changes in mood
 3. Changes in speech patterns
 4. Insomnia
- G. Therapeutic response to the medication may take several weeks.
- H. Can become sensitive to the sun.

ADDITIONAL INFORMATION CONCERNING COMMONLY ORDERED MEDICATIONS

A. chlordiazepoxide (Librium)—mild tranquilizer

1. Action—thought to produce calming effect by enhancing action of one of the nerve transmitters
2. Use—provide short-term relief of mild anxiety
3. Adult dosage
4. Adverse effects
 - a. Expected—drowsiness, lethargy, unsteadiness
 - b. Unexpected—allergic reactions (skin rash), dizziness, fainting, blurred vision, double vision, slurred speech, sweating, nausea
5. Special considerations
 - a. Should not be discontinued abruptly if taken continuously for more than four weeks
 - b. If taken in conjunction with some over the counter drugs that contain antihistamines (allergy and cold preparations and sleep aids), can cause excessive sedation in some individuals.

B. diazepam (Valium)

1. Action—suppresses the spread of seizure activity and depresses the central nervous system
2. Uses—provide short-term relief of mild to moderate anxiety, relieve symptoms of withdrawal, relieve skeletal muscle spasm, provide short-term control of certain types of seizures
3. Adverse effects—allergic reactions, dizziness, faintness, blurred vision, double vision, slurred speech, sweating, nausea, menstrual irregularity
4. Special considerations
 - a. Do not discontinue drug abruptly if taken continuously for more than four weeks; dosage should be tapered off gradually.
 - b. Combining diazepam with some over-the-counter drugs containing antihistamines (allergy and cold preparations, sleeping aids) can cause excessive sedation in some individuals.
 - c. This drug can produce psychological and/or physical dependence if used in large doses for an extended period of time.

C. amitriptyline (Elavil)

1. Action--slowly restores to normal levels certain constituents of brain tissue that transmit nerve impulses
2. Use--relieve symptoms associated with depression
3. Adverse effects--allergic reactions, swelling of face or tongue, headache, dizziness, fainting, tremors, peculiar taste in mouth, irritation of tongue or mouth, nausea, indigestion, breast enlargement, milk formation, swelling of testicles
4. Special considerations
 - a. Psychological or physical dependence is rare and unexpected.
 - b. Discontinue this drug gradually; abrupt withdrawal after long-term use can cause headaches, nausea and malaise.

D. haloperidol (Haldol)--strong tranquilizer

1. Action--not completely known but thought that this drug interferes with the action of dopamine as a nerve transmitter in the brain and thereby reduces anxiety and agitation and improves coherence and thinking
2. Uses--control acute psychosis of unknown nature, treat hyperactivity in children, may be used to control Tourette's Syndrome
3. Adult dosage
4. Adverse effects
 - a. Expected--mild drowsiness, low blood pressure, blurred vision, dry mouth, constipation, Parkinson-like reactions
 - b. Unexpected--allergic reactions (skin rash, hives), dizziness, weakness, agitation, insomnia, loss of appetite, indigestion, nausea, vomiting, diarrhea, urinary retention
5. Special considerations
 - a. Use smallest dose that is effective for long-term treatment.
 - b. Use with caution in epilepsy (can alter pattern of seizures).

E. chlorpromazine (Thorazine)--strong tranquilizer

1. Action--not completely known, though to act to correct an imbalance in nerve impulse transmissions
2. Use--treat agitated depression and states of mental dysfunction
3. Adult dosage

4. Adverse effect
 - a. Expected--drowsiness, blurred vision, dry mouth, nasal congestion, constipation, impaired urination, discoloration of urine (pink or purple--not significant)
 - b. Unexpected--allergic reactions (skin rash, hives, low grade fever), increased appetite and weight gain, weakness, agitation, insomnia, impaired vision, chronic constipation
5. Special considerations
 - a. Many over-the-counter drugs react unfavorably with this drug; consult physician.
 - b. Obtain prompt evaluation of any changes or disturbances in vision.

F. thioridazine (Mellaril)--strong tranquilizer

1. Action--not completely known, thought to correct an imbalance of nerve impulse transmissions
2. Use--manage moderate to marked depression with significant anxiety and severe behavioral problems in children
3. Adult dosage
4. Adverse effects
 - a. Expected--drowsiness, blurred vision, dry mouth, nasal congestion, constipation, impaired urination, discoloration of urine (pink or purple--not significant)
 - b. Unexpected--allergic reactions (skin rash, hives, low grade fever), increased appetite and weight gain, weakness, agitation, insomnia, impaired vision, chronic constipation
5. Special considerations
 - a. Many over-the-counter drugs react unfavorably with this drug; consult physician.
 - b. Obtain prompt evaluation of any changes or disturbances in vision.

LESSON 10: MEDICATION CLASSIFICATION

SECTION 7. MEDICATIONS THAT AFFECT THE ENDOCRINE SYSTEM

OBJECTIVES

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

- 1) Define the classifications of medications which affect the endocrine system.
- 2) Given a specific medication classification, list at least two (2) side effects.
- 3) State responsibilities, other than observation for side effects, when administering medications for specific classifications.
- 4) Describe the difference between insulin shock and diabetic coma and your responsibilities for each.

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

INSULIN - Medication by injection, used to treat diabetes mellitus.

ORAL HYPOGLYCEMICS - Oral medications used to treat diabetes mellitus.

STEROIDS - Medications used to decrease inflammation.

ORAL CONTRACEPTIVES - Medications used to prevent pregnancy (birth control) and relieve problems associated with menstruation

RELATED INFORMATION

Endocrine glands produce chemicals called hormones which enter the bloodstream directly and are quickly carried to all parts of the body. The hormones regulate and control body activities and growth. There are seven endocrine glands, some of which are in pairs.

There is a wide variety of medications which affect the endocrine system. Some medications are prepared to duplicate the actions of hormones or to interfere with the hormonal activity. People who have some type of hormonal deficiency may require medication therapy. For example, the child who is born with a deficiency of growth hormones (produced by pituitary) may stay small in stature unless the hormone is replaced.

Medications which duplicate hormone activity may also be given to treat various disorders. For example, a person who has arthritis may benefit from medication called steroids. The actions of steroids resemble actions of the hormone, cortisone, which is produced by the pituitary gland.

The following chart (7.1) presents a brief description of some of the gland's activity, specific medications, therapeutic use and side effects.

Gland Activity
Chart 7.1

Gland	Hormone Action	Medications	Therapeutic Use	Side Effects
Thyroid	Stimulates the metabolism. Lowers calcium and phosphates	Propylthiouracil Tapazole	Over active thyroid (Hyperthyroidism)	Weight loss, overactivity
		Thyroid Synthroid	Underactive thyroid, (hypothyroidism)	Weight gain, underactivity
Parathyroids	Regulates blood calcium level	Calcitonin Calcium salts	Muscle weakness	Headache, poor appetite, thirst
Testes	Development of sexual maturity	Testosterone	Immature sexual development, cancer in females.	When given to females may cause masculinization

DIABETES MELLITUS

Diabetes is a metabolic disease (condition that interferes with the use of nutrients after digestion). About two million people in this country are known diabetics and an estimated million more have not been diagnosed. The number of diabetics is expected to increase as more people live to old age.

Diabetes is a condition characterized by the body's inability to efficiently burn carbohydrates (starches and sugars). If the body does not burn carbohydrates, it is deprived of the energy needed to lead an active life.

In order for the body to burn sugar for energy, insulin must be present. Insulin is a substance which is produced by specialized cells in the pancreas called the Islets of Langerhans. Insulin promotes five (5) bodily functions:

- 1) transports sugar into cells
- 2) controls the rate of sugar used for energy
- 3) stores sugar in the body for use later
- 4) assists with storage of fat
- 5) stimulates protein tissue growth

When a person does not manufacture enough insulin, they will have symptoms of diabetes. The symptoms may be so gradual that the person may not realize anything is wrong. Occasionally, especially in children, the onset is dramatic. At one extreme the individual may complain of begin chronically tired; at the other, the first sign may be a diabetic coma.

Symptoms of diabetes mellitus are:

- decreased appetite*
- increased thirst*
- increased urine output*
- weight loss
- slow wound healing
- fruity odor to breath

*The most common symptoms are decreased appetite, increased thirst and urine output.

ORAL HYPOGLYCEMICS

Oral hypoglycemics are medications which resemble insulin activity. They are used primarily for adult onset diabetes (Type II). The reactions discussed in relation to insulin therapy are rare with oral hypoglycemics. However, the possibility of reactions does exist and one must always be alert for signs of shock or coma.

Side effects of oral hypoglycemics may include:

- stomach upset
- itching
- hives

As with any side effects, they should be reported and documented.

TABLE 7.2
ORAL HYPOGLYCEMICS

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions
tolbutamide	Orinase	Tablet	Gastric upset	Use with caution if individual	
chlorpropamide	Diabinese				

Side

acetohexamide
tolazamide

Dymelor
Tolinase

Individuals who take insulin or oral hypoglycemics should be instructed that these medications do not cure diabetes mellitus, they only control it. Diabetics should follow a prescribed diet, control their weight, be followed by a physician, and have a form of identification stating they are a diabetic.

COMPARISON OF DIABETIC COMA AND INSULIN SHOCK

INSULIN SHOCK (Hypoglycemic reaction)

Causes: too much insulin
too little food
excessive exercise
vomiting

Onset: Sudden, within minutes

Signs: Skin pale, moist, weak,
hungry,
nervousness, headache,
dizziness,
visual changes, alterations in
consciousness, fainting,
seizures,
coma (late stages)

Blood Sugar: Low, body lacks sugar

First aid: Treat for shock, orange juice,
sugar by mouth*, candy
under tongue.

DIABETIC COMA (Hyperglycemic reaction)

Causes: too little insulin
too much food
illness-increased demand on
body

Onset: slow, hours to develop

Signs: Skin warm, flushed, dry,
eyeball soft
respirations deep, rapid
(Kussmaul)
fruity odor to breath
nausea, vomiting, abdominal
pain
alteration in level of
consciousness
lethargic coma (late stages)

Blood Sugar: High, too much sugar

First aid: immediate transfer to
hospital

*Never give anything by mouth unless individuals is awake and able to swallow.

STERIODS

The adrenal glands secrete the hormones which control inflammation. When irritation or inflammation is present anywhere in the body, there is an increase in the production of these hormones. If the inflammation is very severe, the adrenals may be unable to secrete an adequate supply to control the inflammation. Additional hormones, called steroids, may be needed when a person has rheumatoid arthritis, bursitis, allergic reactions and other problems.

Steroids will not cure the problem, but merely suppress the symptoms. Upon stopping the medication, the symptoms may once again appear. Steroids are used to treat a wide variety of disease processes and do not necessarily affect only the endocrine system.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING STEROIDS

Steroids decrease inflammation and the body's resistance to infection. Therefore, one of your responsibilities is to be alert to signs of infection.

Steroids should not be given to individuals with stomach ulcers, tuberculosis or other severe infections. If such a condition exist, contact nurse.

When administering steroids, responsibilities include:

- observe for signs of infection, administer steroid with milk or food, report any signs of stomach distress, give medication on time

There are a number of possible side effects if the individual is on steroids for a long period of time. Some side effects are:

- puffy face "moon face"
- changes in mood
- muscular weakness
- easy bruising of skin
- abnormal hair growth
- acne

Steroids tend to hold salt and water in the body. Therefore, the "moon face" may be a sign of fluid retention. This medication should not be stopped abruptly but dosage should be tapered. Check with nurse immediately should individual refuse medication.

**TABLE 7.3
ANTI-INFLAMMATORY MEDICATIONS
(steroids)**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Comments
<u>cortisone acetate</u>	Cortone acetate	Tablet & ointment	Rheumatoid arthritis, Bursitis, Skin Conditions, Acne, Muscle weakness	Moon face, mood changes, abnormal hair growth	Should avoid foods high in salt.	Some of these drugs can cause osteoporosis. Antacids and other over-the-counter drugs may give them a false reading. NEVER STOP MEDICATION WITHOUT
<u>hydrocortisone</u>	Hydrocortisone Cortel Cortril					
<u>prednisone</u>	Deltasone Mefacorten Parsocort		Delayed wound healing			
<u>methyl-prednisolone</u>	Medrol	Tablet	Hypertension, Peptic Ulcer			
<u>prednisolone</u>						
<u>triamcinolone</u>	Aristocort Kenacort	Tablet & ointment				

BIRTH CONTROL MEDICATION

There are many different preparations available and each one has specific directions for use. When administering the medication, a major responsibility is to read the label for directions. Dangerous side effects to be alerted to are:

- Abdominal Pain
- Chest Pain
- Headache
- Eye Problems
- Severe Leg Pain

A-C-H-E-S

The word ACHES will help you remember these symptoms as each symptom begins with the letters used to spell "aches".

Review Table 7.4 for additional information on birth control pills.

**TABLE 7.4
BIRTH CONTROL MEDICATIONS**

	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
mestranol	Ortho-Novum	Tablet	Inhibit ovulation by suppressing Estrogen secretion	Approximately 40% of women on these medications have side effects: nausea, vomiting, weight gain, breast fullness, irregular menstruation, depression, vaginitis	<p>Oral contraceptives effectiveness may be diminished when these medications are used; Dilantin, Mysolin, INH, Penicillin, Sulfonamides</p> <p>Oral contraceptives decrease effectiveness of: Anticoagulants, Anticonvulsants, Antihypertensives</p>	<p>Oral contraceptives should not be used if:</p> <ul style="list-style-type: none"> perforated ulcer Cardiovascular problems Cancer Liver Problems Pregnancy Hypertension Disease of Gallbladder Overweight Arteriosclerosis Severe Depression Blood clots
ethinyl estradiol	Lo/Ovral Ovulen Norlestrin Zorane Demulen	Tablet				

LESSON 10: MEDICATION CLASSIFICATION

SECTION 8. MEDICATIONS THAT AFFECT THE GASTROINTESTINAL SYSTEM

OBJECTIVES

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

- 1) Define the classifications of medications which affect the gastrointestinal system.
- 2) Given a specific medication classification, list at least two (2) side effects.
- 3) State responsibilities, other than observation for side effects, when administering medications in these classifications.
- 4) List three (3) common causes of constipation.

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

ANTACIDS - Medications which are used to neutralize excess stomach acid.

EMETICS - Medications used to cause vomiting.

ANTI EMETICS - Medications which relieve nausea and vomiting.

CATHARTICS - Medications used to relieve constipation.

ANTIDIARRHEALS - Medications used to stop diarrhea.

RELATED INFORMATION

The gastrointestinal system is also called the G.I or digestive tract. It extends from the mouth to the anus and is lined with mucous membrane. The organs of this system change food into simple forms able to pass through the walls of the small intestine to the circulatory system. The circulatory system carries the nutrients to the body. The non digestible portions of what we eat are moved along the intestines until they are finally excreted from the body as feces. Many organs contribute to the digestive process.

ANTACIDS

Antacids are medications used to neutralize excess stomach acid.

Hydrochloric acid produced in the stomach is necessary for proper digestion. Ordinarily the stomach lining is resistant to breakdown, but under certain conditions (e.g., excessive or prolonged secretion of hydrochloric acid during period of worry or stress) a small area of the lining may break down and form a stomach ulcer. Antacids can be used to prevent ulcer formation as well as to treat ulcers and combat indigestion referred to as heartburn.

Signs and symptoms of excess stomach acid include:

- burning in stomach
- burping
- upset stomach

As you may recall, many medications are irritating to the stomach and the doctor may order an antacid to help reduce stomach irritation. However, it is important to note that antacids may also decrease the absorption of a medication which may change the medication's effectiveness. Do not give water after medication is administered.

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTACIDS

These medications are available in liquid or tablet form. Liquid preparations are generally more effective.

Side effects are minimal, but constipation and/or diarrhea has occurred when antacids are used over an extended period. Responsibilities include giving the medications on time and in proper relationship to meals. Table 8.1 list specific antacids.

TABLE 8.1
ANTACIDS
(non-prescription medications)

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions
aluminum hydroxide	Amphojel, Creamalin	Tablet & Liquid	Treatment and/or prevention of gastric ulcers.	Rare, but may cause constipation	Given between or before meals.
aluminum hydroxide & magnesium trisilicate	Gelusil		Also used for indigestion		Antacids may interfere with absorption of other medication.
aluminum magnesium hydroxide	Maalox				Many antacids contain salt. Individuals on low salt diets should only use low salt antacids.

EMETICS

Emetics are used to cause vomiting and are used primarily as a first aid measure when prompt emptying of the stomach is essential, as with accidental poisoning.

The use of emetics should be avoided in cases of corrosive poisoning since tissue damage of the mouth and throat is increased by the second passage of material over these structures. Most cleaning agents are corrosive and have directions if accidental swallowing happens.

One medication which can be used is Syrup of Ipecac. This medication works quickly. Directions for dosage are on the label and should be read very carefully. Many people with children keep Ipecac on hand for emergencies.

Contact Poison Control Center, based on agency policy, should you suspect poisoning, before any action is taken.

ANTI EMETICS

These medications relieve nausea and vomiting. Numerous preparations have been used, but ordinarily the most effective treatment must be chosen with due respect to the cause of nausea. Some medications previously discussed in the respiratory and nervous system sections may be used as antiemetics.

Some antihistamines, such as Phenergan and Dramamine are also used as antiemetics.

Compazine which is a mild tranquilizer is also used as an anti emetic. In general, side effects of anti emetics are:

- drowsiness
- dry mouth

Nausea and vomiting may also be treated with household remedies, such as coca cola and warm tea.

CATHARTICS AND LAXATIVES

Cathartics and laxatives are used interchangeably. Laxatives are milder, cathartics stronger. These medications are used in treatment of constipation, which is a condition that occurs when fecal material remains too long in the large intestine. The feces becomes hard and causes distention in the lower bowel.

Constipation usually results from one or more of the following causes:

- improper diet
- poor fluid intake
- tension and worry
- lack of exercise

In most cases, the correction of one or more of these simple health rules will take care of the constipation problem. In other cases, however, cathartics may be ordered. It is important to remember that there is no set time limit between bowel movements.

CAUTION AND/OR RESPONSIBILITIES WHEN ADMINISTERING CATHARTICS AND LAXATIVES

These medications should never be given if an individual is complaining of abdominal pain, nausea or vomiting. These signs could indicate more serious problems than constipation, such as appendicitis.

Cathartics and laxatives may cause the following side effects:

- abdominal cramps
- nausea
- abdominal pain

Review Table 8.2 on cathartics and laxatives.

TABLE 8.2
CATHARTICS & LAXATIVES
(All are non-prescription medications)

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Notes
dioctyl sodium	Dialose Colace Pericolace	Tablet	Constipation	Rare, with over use could cause diarrhea	May interfere with adequate nutrition.	Take with food
dioctyl calcium	Surfax				When individuals are taking any CNS depressants, they may also be order to take Dialose or Colace which reduces constipation due to depressants.	
psyllium hydrophilic bisacodyl	Metamucil Duocolax	Granules Tablets & Suppositories		Abdominal cramps		5-10 days than 10

ANTIDIARRHEALS

Antidiarrheals are used to treat diarrhea, which is a symptom of a disorder of the bowels associated with rapid passage of feces.

Some causes of diarrhea are:

- contaminated or partially digested food; intestinal infection.
- nervous disorder
- circulatory disturbances
- certain allergic disorders

In view of these numerous causes, the treatment of diarrhea varies greatly. In many cases, a cathartic that brings about emptying the entire contents of the bowel may be the means to relieve diarrhea because it removes the irritating material.

Simple diarrhea is most frequently due to:

- poor eating habits
- emotional stress

CAUTIONS AND/OR RESPONSIBILITIES WHEN ADMINISTERING ANTIDIARRHEALS

The best situation is to try and prevent or rectify the cause of diarrhea. However, medications treatment may be necessary. Most of the antidiarrheals are relatively non-toxic to organs other than the intestines because they are not absorbed into the general circulation. The most frequent side effect produced by antidiarrheal medications is constipation.

Antidiarrheals should not be administered for more than a few days. Many of these medications are non-prescription. Review Table 8.3.

**TABLE 8.3
ANTIDIARRHEAL AGENTS**

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Caution
diphenoxylate	Lomotil	Tablet & Liquids	Treat diarrhea	Fatigue, Vertigo	Increases action of CNS depressants.	If overused, constipation
bismuth subsalicylate	Pepto-Bismol	Liquids				
kaolin & pectin	Kaopectate Par-gel					
kaolin, pectin, mixtures	Donagel					

LESSON 10: MEDICATION CLASSIFICATIONS

SECTION 9. MEDICATIONS THAT AFFECT THE SKIN AND MUCOUS MEMBRANES

OBJECTIVES

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

- 1) Define the classifications of medications which affect the skin and mucous membrane.
- 2) Given a specific medication classification, list at least one (1) side effect
- 3) State responsibilities when administering various topical medications.

RELATED INFORMATION

The skin tells us much about the general health of the body. A fever may be indicated by unusual redness or flushing of the skin. Pallor (less color than normal) is a sign associated with many conditions. The oxygen content of the blood can be noted quickly by the color of the skin. When the oxygen content is very low, the blood is darker and the skin appears bluish (cyanotic).

STRUCTURE AND FUNCTION

The skin is one of the most important organs in the body. The integumentary system includes the skin and accessory structures, the hair, nails, nerves, and the sweat and oil glands. The top layer is constantly being washed or worn away as it is renewed from the lower layer.

MUCOUS MEMBRANES

The mucous membranes are continuous with the skin and line all body openings. The mucous membranes secrete mucous, which tends to cover the surface of the membranes, protecting them from foreign bodies and waste materials.

Medications applied to the skin serve many functions and may be intended either for local effect or for a general effect following absorption through the skin and/or mucous membrane.

The medications may conveniently be divided into the following classifications. Medication described in each classification are available without a prescription.

EMOLLIENTS

Oily substance applied to soothe the skin or mucous membranes. The oily layer protects the skin from irritants and makes the skin softer due to penetration of the emollient into the surface layer. Some commonly used emollients are Vaseline, various lotions, and cold creams.

DEMULCENTS. These protective agents are used primarily to alleviate irritation, particularly of mucous membranes. They are generally applied to the surface in a thick (viscid) preparation. Demulcents may be incorporated in lozenges to soothe oral and throat mucous membranes. A common demulcent base is glycerin which is found in many external lotions and is a base in some cough syrups and drops.

ASTRINGENTS. Astringents are medications which have a tendency to lessen secretions and stop minor bleeding. They shrink swollen and inflamed tissues. Witch hazel and rubbing alcohol are two common astringents and are used as a base in many skin preparations.

COUNTERIRRITANTS. Counterirritants are medications which are used to irritate unbroken skin areas in order to relieve pain in deeper tissues. Common examples are Ben-Gay, and Oil of Wintergreen.

ANTIPRURITICS. Antipruritics are agents that relieve itching. Various preparations are used, but the cause of itching determines the medication to be used. For example, the itching caused by poison ivy can be relieved by Calamine Lotion.

LOCAL ANESTHETICS. Agents which numb a specific area. Many ointments contain local anesthetics and are applied topically for minor conditions, such as: sunburn, insect bites, as well as for more serious conditions, such as burns and hemorrhoids. Some examples are: Surfacaine, Benzocaine and Nupercaine.

ANTISEPTICS. Agents that destroy or prevent the growth of bacteria on the skin. Some antiseptics may be used to treat a skin infection and/or prevent an infection from occurring.

CAUTION AND/OR RESPONSIBILITIES WHEN APPLYING SKIN PREPARATIONS:

Most skin preparations can be obtained without a prescription, but this does not diminish the seriousness of these preparations. Always read the labels for directions. The major caution is that they are external medications and should never be taken internally. Most of the labels will include directions in case of accidental swallowing. In addition, you should be aware of the poison control number in your area.

Chart 9.1

ANTISEPTICS

Generic Name	Trade Name	Preparation	Therapeutic Use	Side Effects	Food/Medication Interactions	Contraindications
bacitracin	Bacitracin	Antibiotic ointment	Infections of the skin	Rare, may include skin rash, redness and pruritus		Shedding of teeth by mouth
gentamicin	Garamycin	"	"	"		
benzalkonium chloride	Zephiran Chloride	Solution	Irrigations and used to sterilize materials when necessary			Use carefully around eyes
benzoin tincture	Benzoin	Ointment & Liquid	Promotes healing			
boric acid	Boric Acid	Ointment, solution & powder	Skin antiseptic			May irritate mucous membranes of eyes
hydrogen peroxide	Hydrogen Peroxide	Solution	Skin antiseptic			
iodine tincture	Iodine	Solution	Skin antiseptic			
Providone-iodine	Betadine	Ointment & concentrate	Skin antiseptic			Ointment irritates mucous membranes
phisoderm	Phisoderm	Liquid soap	Skin antiseptic			

Answer Self Test Questions Lesson 10- Section 9- Medications that Affect the Skin and Mucous Membranes

LESSON 10: MEDICATION CLASSIFICATIONS

SECTION 10. MEDICATIONS THAT AFFECT THE EYE AND EAR

OBJECTIVES

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

- 1) Define the classifications of medications which affect the eyes.
- 2) Define the classifications of medications which affect the ears.
- 3) Discuss procedure for administering eye drops.
- 4) Describe procedure for administering ear drops to an adult.

THE EYE

A number of medications are instilled in the eye via ointments and drops. There are also some medications used to irrigate the eyes in case of infection.

Proparacine (Ophytaine) is used for relief of pain. It is available in eye drops only.

Miotics are a group of medications which constrict the pupil. Miotics are used in the treatment of glaucoma (common eye problem in the elderly).

Most miotics are administered as eye drops.

neostigmine oromide	Prostigmin	eye drops
carbachol	Doryl	eye drops
physostigmine	Eserine	eye drops & tablets

OPHTHALMIC OINTMENTS

Many of the antibiotics are prepared as ophthalmic ointments. e.g., Bacitracin, Aureomycin and Neosporin.

The major responsibilities are to be sure you are administering the drops to the designated eye and maintain clean techniques (washing your hands before and after administering any medication).

- A. To instill ointment, pull down the lower eyelid as the individual looks upward. Squeeze the ointment into the lower eyelid. Avoid touching the tube to the eye or lid.
- B. The individual should tilt face upward to receive an eye drop. Use an absorbent tissue to prevent excess drops and tears from flowing down the individual's face.

Procedure for Instilling Eye Drops and Ointments

1. Wash your hands and/or have the individual wash their hands.
2. Place the individual's head on a suitable support, such as a pillow. Direct his face toward the ceiling.
3. Instruct the individual to fix his gaze on a point above his head.
4. If secretions are present, remove them by gently wiping the eyelid from the inner corner to the outer corner.
5. Apply gentle traction to the lid lashes at the bony rim of the eye; do not apply pressure to the eyeball.
6. Approach the eye from below with the dropper or ointment tube, outside of the individual's field of vision; do not touch the eye with the dropper or tube.
7. **FOR EYE DROPS:** Always warm drops to room temperature. (You may warm drops by holding bottle between your hands and rolling bottle back and forth) Always hold the dropper with the tip straight down. Release the prescribed number of drops into the conjunctival sac; do not allow drops to fall more than 1 inch. Avoid letting the drops fall onto the eyeball as this is painful.

Apply gentle pressure inward and downward against the bones of the nose for about 2 minutes. This prevents the medication from entering the lacrimal (tear) duct and being absorbed through the nasal cavity.

Discard any drops left in a dropper.

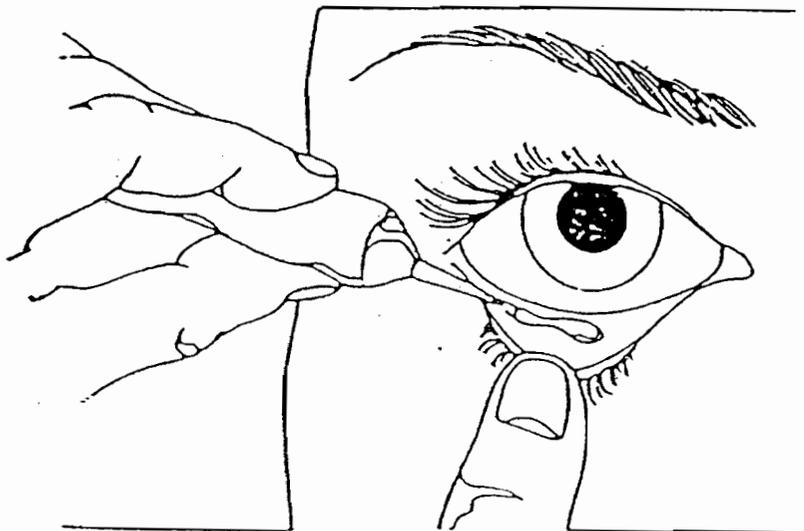
If the dropper touches the eye, wash it with soap and water

Eye Drops



FOR EYE OINTMENT: Squeeze a small amount of medication along the **INSIDE** of the lower eyelid. Instruct the individual to keep eye closed for 1 - 2 minutes to allow the medicine to spread and be absorbed.

8. Wash hands.
9. Record on the medication record.



THE EAR

Just as the eye is sensitive to light, the ear is sensitive to sound. The ear has three parts: the outer ear, the middle ear and the inner ear.

Since it is impossible to reach the inner ear due to the eardrum, conditions such as otitis media (infection in the inner ear) must be treated by oral antibiotics. However, the pain caused by external and middle ear infections may be treated with medications administered as ear drops. Dibucaine has an anesthetic action and is used to relieve ear pain. Some mild oral analgesics may also be ordered.

Nausea and vomiting are associated with problems in the inner ear. As you recall, this area helps us maintain a sense of balance. It is thought that the reason people develop motion sickness is due to a disturbance in the middle ear. Anti emetics previously discussed, such as Bonine and Dramamine may be used.

The primary responsibilities when working with ear drops are:

- to maintain clean technique.
- to warm ear drops to body temperature.
- to avoid touching the ear with the dropper.

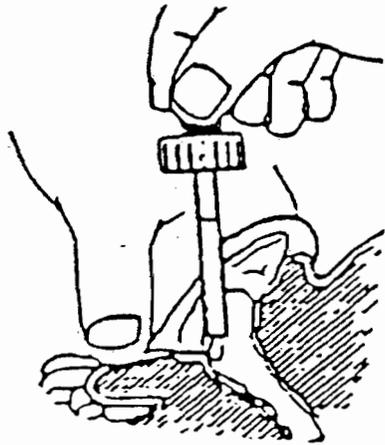
Following the procedure will assure proper installation of ear drops.

Administration of Ear Drops

1. Allow drops to warm to body temperature by holding the bottle in your hand for a few minutes. Hold the bottle yourself it is unsafe for the individual to do so.
2. Have the individual lie on his side with the ear to be treated upward.
3. Shake the medicine, if required, and draw up into the dropper.
4. To allow the drops to run in:
 - a. Adults - pull the pinna (earlobe) back and up and allow the drops to fall in the external canal.
 - b. Children - pull the pinna (earlobe) back and down and allow the drops to fall in the external canal. (under the age of 3)
5. Do not insert the dropper into the ear and do not allow the dropper to come in contact with any portion of the ear.

6. Have the individual remain on his side for a few minutes to allow the medication to reach the eardrum.
7. Insert a soft cotton plug if ordered. Never pack the plug tightly into the ear.

Caution: Monitor carefully so that individual does not tamper with cotton in ear.



MEDICATION ATTENDANT COURSE

GLOSSARY

GLOSSARY

A

Abdominal distention--Enlarged abdomen.

Absorption--The taking up of fluids or other substances by the skin, mucous surfaces, or absorbent vessels.

Acetylcholine--Chemical present in many organs and tissues of the body that has important physiological functions, i.e., transmission of a nerve impulse across a synapse - neurotransmitter.

Acne--A disorder of the hair follicles and oil-producing glands of the skin.

Adverse effect--Side effect of a medication; undesirable reaction.

Affective psychosis--Psychotic reaction in which a person exhibits wide swings in emotional feelings.

AIDS--Acquired Immune Deficiency Syndrome is a disease that affects the body's ability to fight infection. AIDS is spread through the body fluids of an infected person by sexual intercourse (vaginal, anal, oral), sharing IV needles, infected mother passing the disease to the fetus, transfusion of blood or blood products.

Akathisia--Motor restlessness-inability to sit or lie down quietly. Continuous movement of the hands, mouth, picking at self, rocking in a chair, and drumming fingers, pacing the floor, rocking when standing.

Akinesia--Fatigue and weakness of the arms and legs. Apathetic, disinclined to initiate or to expend energy to complete a task.

Alcohol--Any beverage that contains ethyl alcohol (ethanol), the intoxicating sedative-hypnotic in fermented and distilled liquors. A CNS depressant, depending on the amount consumed, alcohol acts as an analgesic, tranquilizer, sedative-hypnotic, soporific, intoxicant, anesthetic, or narcotic.

Allergen--A substance that causes a hypersensitive reaction (an allergy).

Allergic effect--Sensitivity to any substance contacted by touch, inhalation, ingestion, or injections such as poison ivy, pollen, insect bites, foods, or medications; effects include sneezing, itching, swelling, difficulty in breathing.

Anaphylactic reaction--Life-threatening allergic reaction caused by an allergen. Characterized by respiratory problems, fainting, itching, welts on the skin.

Androgens--Male hormones.

Anesthetics--Medications that cause a loss of sensation.

Angina--Any disease in which spasmodic and painful suffocation or spasms occur.

Anorexia--Lack or loss of appetite for foods.

Antacid--Given to neutralize excessive acid in stomach. (Example: Maalox).

Antagonistic effect--An agent, such as a remedy or a drug, which tends to nullify the action of another agent.

Anthelmintic--Given to kill worms in gastrointestinal tract. (Example: Povan).

Antianxiety drugs--Minor tranquilizers, also used for prevention and treatment of convulsions.

Antiasthmatic and Bronchodilator--Given for asthma and lung congestion (example: Tedral, Isuprel)

Antibiotics--Substances produced by certain fungi, bacteria, and other organisms that are effective in inhibiting the growth of or destroying microorganisms--e.g. penicillin.

Antibiotic and Antibacterial--Given to control infections (example: Penicillin).

Anticonvulsants--Medications used to stop or prevent convulsions or seizures.

Antidepressants--Alleviate the symptoms of depression.

Antidiabetic agent--Given for treatment of diabetes (example: Diabinese).

Antidiarrheal preparation--Given to control diarrhea (Example: Kaopectate, Paregoric).

Antiemetics--Drugs used to treat and prevent nausea and vomiting.

Antihistamines--Drugs that are used to reduce the effects associated with histamine production in allergies and colds.

Anti-inflammatory--Medications used to reduce swelling, pain, and tenderness caused by inflammation.

Atherosclerosis--A deposit or degenerative accumulation of cholesterol and lipid material in the arteries.

Antipsychotics--Major tranquilizers, used to control symptoms of psychoses and organic brain syndrome; can change behavior but does not cure disease.

Antipyretic--Given to lower a temperature that is above normal (example: Aspirin, Tylenol).

Antiseptic—A substance that inhibits the growth of germs. Antiseptic solutions are used as cleaning agents to prevent the spread of infection.

Antitussives—Medications that relieve coughing.

Anuria—No urinary output.

Anxiety neurosis—Frequent feeling of uneasiness or fear with no apparent cause, associated with somatic symptoms and without organic disease.

Apathetic—Lack of concern or caring.

Aphasia—Defect or loss of the power of expression (speech, writing, or signs), or of comprehending spoken or written language, due to injury or disease of the brain centers.

Arrhythmia—A change in the time or force of the rhythm of the heartbeat.

Arteriosclerosis—Thickening and hardening of arterial walls caused by calcium build-up that interferes with blood circulation.

Arthritis—Inflammation of a joint.

Aseptic—Free of infection. Often refers to proper handwashing and other measures taken to prevent the spread of infection.

Aspiration—The taking of foreign matter (such as food) into the lungs during the respiratory cycle.

Assault and battery—The threat to use force upon another person and the carrying out of the threat.

Asthma—A chronic respiratory disease, often from allergies, and accompanied by labored breathing, chest constriction, and coughing.

Athlete's foot—A contagious fungus infection of the feet.

Atomizer—A device used to deliver a fine spray of medicine.

Auditory canal—Tubular passages or ducts that assist in hearing or in the sense of hearing.

Autonomic Nervous System (ANS)—The division of the vertebrate nervous system that regulates involuntary action (intestines, heart, and glands) and makes up the sympathetic and parasympathetic nervous systems.

B

Blood pressure--The force exerted by the heart against the arterial walls when the heart contracts (systolic) or relaxes (diastolic).

Bradycardia--Slowness of the heartbeat; less than 50 beats per minute.

Back sinus--An air cavity in one of the cranial bones that connects with the nose.

Bronchitis--Inflammation or swelling of the bronchial tubes.

Bruise--Black and blue area caused by an injury to the surface of the skin.

Buccal--Medication is placed between the teeth and the mucous membrane of the cheek.

Bulbourethral glands--Small structures about halfway between the bladder and the end of the penis that secrete sperm protectant.

Burns--Injury to the skin by strong chemicals, electricity, high temperatures, or radiation.

Bursitis--Inflammation of a bursa, usually at the shoulder, elbow, or knee joints.

C

Caffeine--A white, bitter, crystalline substance that has stimulant effects and constricts blood vessels in the brain.

Caffeinism--Excessive ingestion of large amounts of caffeine, usually in coffee or tea for prolonged periods.

Capsules--Medication in small cylinder-like containers.

Carbohydrates--Sugars, starches, and cellulose.

Cardiotonics--Medications used to strengthen the activities of the heart.

Cataracts--The lens or capsule of the eye loses its transparency or translucency causing partial or total blindness.

Chills--Shivering or shaking.

Chronic kidney failure--Reduction in kidney function.

Chronic Obstructive Lung Disease (COLD)--Chronic airway obstruction.

Cirrhosis--Chronic liver damage caused by previous disease.

Cocaine--From the coca plant, a short-acting but very powerful stimulant. Heavy usage can lead to "paranoid syndrome in which the user is highly suspicious and nervous.

Code of Ethics--A voluntary set of rules that influence relationships between people

Comatose--Cannot be aroused; unconsciousness.

Common cold--Communicable viral disease.

Competent--Well-qualified or capable.

Conjunctival sac--Mucous membrane that lines the inner surface of the lower eyelid

Conjunctivitis--Inflammation of the mucus membrane that lines the inner surface of the eyelid and the exposed surface of the eyeball.

Constipation--Difficult, incomplete or infrequent bowel movements.

Contaminated--When something is impure or dirty, when it has germs or bacteria on it that may cause disease or infection.

Contracture--Permanent shortening of a muscle that produces a deformity.

Convulsions--Abnormal, uncontrolled movement of all parts of the body.

Creams--Medication applied to the skin or mucous membrane that is more easily absorbed by the skin than ointments.

Cumulative dose--If the body does not use all of drug does the drug may remain in the body and build up with each new dose; when the drug builds up it can lead to harmful and dangerous side effects that must be watched for. To help prevent this the resident should be given many liquids to drink. Also the regularity of bowel movements should be checked; if the person is constipated the drug may not be passing out the body as it should.

Cumulative effect--Build-up of medication in the body due to slow excretion that could lead to a toxic effect.

Cyanosis--A bluish discoloration of the skin caused by the lack of oxygen in the blood.

Cystitis--Inflammation of the urinary bladder.

D

Daydream--A dreamlike musing or fantasy while awake.

Decubitus ulcer--An open wound that is caused by the pressure of lying or sitting in one position for a long period of time. Also called a pressure sore or bedsore.

Dehydration--Excessive loss of water from the body.

Depressants--Medications used to decrease mental and physical activity.

Depression--A lowering or decrease of activity functioning with the following symptoms: lack of interest in life, insomnia, loss of appetite due to inability to cope with one's life.

Dermis--A layer of skin.

Desired effects--The normal effect of a drug; the reason for which the drug was given.

Diabetes--A disorder of carbohydrates, protein, and fat metabolism that prevents the body from properly converting foods into energy for carrying out vital functions.

Diarrhea--Frequent, loose bowel movements.

Disinfectant--Substance used to destroy microorganisms.

Diuretic--Given to rid the body of excess fluid by urination (Example: Diuril, Dyazide)

Dopamine--Chemical present in many parts of the body that has important physiological functions, i.e., transmission of a nerve impulse across of synapse neurotransmitter. Dopamine is a product of norepinephrine.

Drug interaction--The action of one medication interferes with the action of another the effects of two or more medications.

Duodenum--The first portion of the small intestine.

Duty of Care--Performance of services that meet common standards.

Dyskinesia--Abnormal movements of the body such as a dramatic onset of spasms, oculogyric crisis (begins with a stare, rolling of eyes, tilting of head, facial expressions, protrusion of the tongue, stiff neck, inability to swallow, stammering speech (dysarthria), labored breathing, and involuntary muscle movements.

Dysphagia--Difficulty in swallowing.

Dyspnea--Difficulty in breathing.

Dysuria--Painful or difficult urination.

E

eczema--A noncontagious inflammation of the skin, marked mainly by redness, itching, and the outbreak of lesions that discharge fluid and become encrusted and scaly.

Edema--Swelling caused by large amounts of fluid in the tissues.

Emaciated--Thin, underweight.

Emesis--Vomiting.

Emphysema--A condition of the lungs resulting in labored breathing and increased susceptibility to infection.

Enema--Used to cleanse the lower bowel, relieve constipation; some types will relieve gas or act an emollient (soothing irritated tissues of the colon), and administer medication.

Epidermis--The outer protective layer of the skin.

Epididymis--Coiled structure that stores and matures sperm cells.

Epilepsy--Chronic disorder characterized by recurring seizures that last from a few seconds to several minutes and require specific medication for prevention and control.

Estrogen--Female hormones.

Excoriation--A scratch on the skin, usually covered with a scab.

Excretion--Eliminating waste, such as sweat, urine, or feces from the body.

Expectorant--Medication that assists in liquefying the mucus to make it easier to cough up.

Extrapyramidal--Outside of the pyramidal tracts.

F

Fecal impaction--A collection of "putty-like" or hardened feces in the rectum.

Feces--Waste excreted from the bowels.

Fever--Body temperature above normal.

Fibrillation--Very rapid irregular contractions of the muscle fibers of the heart resulting in the heartbeat and the pulse not beating simultaneously.

Flushing--Redness of the skin.

Flutter--Very rapid rhythmic contractions of the heart muscles.

Fracture--Broken bone.

Friction--The rubbing of one thing against another. For example, when you wash your hands aseptically you create friction by rubbing them together in a brisk, back-and-forth motion.

G

Gallbladder--Sac in which the bile from the liver is stored.

General effects or Systemic effects--Caused by drugs that circulate in the bloodstream through the entire system and effect the whole body.

Generic--Commonly available drugs that are not protected by trademark.

H

Hematemesis--Vomiting blood.

Hemiplegia--Paralysis on only one side of the body.

Hepatitis--Inflammation of the liver.

Histamine--A white crystalline compound found in plant and animal tissue. It is a stimulator of gastric secretion, and is used medicinally as a vasodilator to increase blood supply to the brain.

Hives--Red, swollen, itchy areas.

Hormone--A chemical substance secreted into the body fluids by an endocrine gland which has a specific effect on the activities of other organs.

Hyperglycemia--An abnormally high level of sugar in the blood.

Hypertension--High blood pressure.

Hypnotics--Medications used to produce sleep.

Hypoglycemia--An abnormally low level of sugar in the blood.

Hypokalemia--An abnormally low level of potassium in the blood.

Hypotension--Low blood pressure.

Idiosyncrasy--Unusual or unexpected effects from a medication.

Immunity--Resistance of the body to a particular disease.

Incident report--Written account of an error in documentation or medication administration, injury to an individual, or injury to a staff member or visitor.

Incontinence--Loss of bladder and/or bowel control.

Infection--Activity of disease-producing bacteria, virus, or fungus in the body and the reaction of the body to the microorganisms and their products.

Infectious hepatitis--Contagious infection of the liver.

Inflammation--Localized heat, redness, swelling, and pain as a result of irritation, injury, or infection.

Influenza--An acute highly contagious infection. Flu.

Inhalation--To draw in by breathing.

Inhaler--A device used to administer medication by the act of breathing in.

Initial or Attack Dose of Medication--This is the first main dose of a drug given to the person; this dose may be larger than the ones that follow it.

Inner canthus--The corner of the eyelid closest to the nose.

Insertion--Medication is placed into a specific area of the body, usually with the fingers.

Insomnia--Inability to sleep.

Instillation--The process of administering a liquid - usually drop by drop.

Insulin--A preparation derived from the pancreas of the pig, ox, or developed from semi-synthetic human insulin that is used in the medical treatment of diabetes.

Iron deficiency anemia--Low iron levels in the blood due to inadequate diet or blood loss.

Ischemia--Temporary decrease in the amount of blood being delivered to a part of the body, mainly due to the contraction of the blood vessel.

J

Jaundice--Yellowish discoloration of tissues and body fluids with bile pigment caused by any of several pathological conditions in which normal processing of bile is interrupted.

K

Ketoacidosis--Result of fat being used for energy resulting in an acidotic state. Form of acidosis in which sodium, potassium, and ketone bodies are lost in the urine; found in individual who have diabetes mellitus.

L

Labia--Folds of skin or mucous membrane that surround the vagina.

Laceration--A wound made by tearing.

Laxative--Given to cause a bowel movement (example: Exlax, Senokot).

Lethargic--Not alert, drifts off into sleep, drowsy, sluggish.

Libel--Any written statement that damages a person's character.

Liniment--A solution used as a vehicle to distribute medication.

Liver--organ of the body that secretes bile and causes changes in many of the substances in the blood.

Local action--Medication acting at the site of administration, on the skin or mucous membrane.

Lotions--Watery preparations that contain medication; are to be patted on, not rubbed in.

M

Maintenance dose of medication--The doses following the initial dose.

Malpractice--Improper, injurious or negligent professional treatment or care of an individual.

Marijuana--The dried leaves and flowering tops of the pistillate hemp plant that yield THC and is usually smoked.

Medical asepsis--Cleaning measures taken to prevent the spread of infection in a doctor's office, hospital, or long-term care agency.

Medication--Any substance used in the diagnosis or treatment of disease or the relief of pain or other symptoms.

Medicine dropper--A small glass or plastic tube usually capped by a hollow rubber bulb at one end that is used for measuring and administering medication.

Metabolism--The physical and chemical processes involved in the maintenance of life.

Miotics--An agent that causes contraction of the pupil of the eye.

Mons pubis--Soft fatty tissue covering the joint of the pubic bones.

Mood stabilizers--Used to stabilize mood swings (elation or depression).

Mucous membrane--The inner lining of the mouth and labia minora.

Muscle relaxant--Medication that helps muscle tissue relax and be less tense and painful.

Muscle spasm--Condition of the muscles in which there is a sudden and violent tightening of the muscle.

Muscle strain--Condition in which the muscle is stretched.

Mydriatics--A drug that produces dilation of the pupils.

N

Nausea--Feeling the need to vomit.

Negligence--Omission or neglect of any reasonable precaution, care, or action.

Neuron--A nerve cell.

Neurotransmitters--Chemical substances that assist an electrical nerve impulse to travel across the synapse.

Nonsteroidal anti-inflammatory agents (NSAIA)--Medications used to relieve symptoms of inflammation.

Norepinephrine--Chemical present in the adrenal glands.

O

Obese—Extremely overweight.

Ointment—Mixtures of medications with a fatty base, soft enough to spread at room temperature or melt at body temperature.

Oliguria—Secretion of a diminished amount of urine in relation to the fluid intake.

Ophthalmic medication—Medication that is used exclusively in the eyes.

Oral—By mouth.

Oral-hypoglycemics—Stimulate specialized cells in the pancreas to produce insulin.

Orthopnea—Inability to breathe except in an upright position.

Osteoporosis—Abnormal porousness of the bone caused by the enlargement of its canals or the formation of abnormal spaces. Causes brittleness.

Otic Preparation—Any medication placed in the ears, usually to clean the ear or to treat ear infections (example: Cortisporin Otic Drops)

Outer canthus—The outer corner of the eyelid.

P

Pallor—Paleness of the skin.

Pancreas—A large gland that secretes digestive enzymes and the hormone insulin.

Paranoia—Slower, progressive psychosis characterized by suspicions or ambition and delusions of persecution or of grandeur.

Paraplegia—Paralysis of the legs and lower part of the body; caused by disease or injury to the spine.

Parenteral—Introducing medication or food into the body by injection.

Parkinsonism—Varying degrees of loss of associated movements—rigidity of limbs, tremors, gait and posture disturbances, drooling, and skin changes.

Pediculosis—A contagious infestation of the hair, body, and pubic area caused by lice.

Penis—Cylinder-shaped vascular structure on the outside of the male body. Houses the external portion of the urethra, and is the male organ of copulation.

Perineal--The area between the thighs that includes the anus and vulva in the female and the anus and penis in the male.

Pernicious anemia--Vitamin b₁₂ deficiency.

Perineum--The area between the anus and the posterior part of the external genitalia.

Petechia--A small spot on the body surface caused by a minute hemorrhage.

Phlebitis--Inflammation of a vein.

Phobia--A persistent, illogical, or intense fear of something.

Physical dependency--State in which withdrawal of a drug produces specific symptoms such as muscle cramps, vomiting, or tremors.

Pneumonia--An acute or chronic disease marked by inflammation and infection in the lungs.

Polyuria--Large amounts of urinary output.

Powder--Solid medication that has been ground into fine particles and used in that form.

Primary effect--Reason a medication was ordered.

Prostate--Doughnut-shaped gland, in the male, composed of muscular and glandular tissue that surrounds the urethra at the bladder and adds alkaline substance to sperm.

Psoriasis--A chronic, noncontagious disease characterized by inflammation, reddened lesions, and white scaly patches.

Psychological dependency--An emotional need or craving for a drug.

Psychosis--any severe mental disorder, with or without organic damage, characterized by deterioration of normal intellectual and social functioning and by partial or complete withdrawal from reality.

Psychotropics--Drugs that affect moods.

Pulse--Rhythmical throbbing of the arteries caused by the heartbeat.

Pyelonephritis--Inflammation of both the kidney and the lining of the pelvis.

Pyorrhea--Inflammation of the gum and tooth sockets leading to loosening of the teeth.

R

Range of motion--Moving a joint its full range in an attempt to prevent muscle contractions and joint deformity.

Rash--A skin eruption, usually reddened and raised.

Rationalization--To devise self-satisfying but incorrect reasons for one's behavior.

Reasonable care--Doing only those things that you have been trained to do; acting as others would act in the same or similar situations.

Rectum--The lowest or last, segment of the large intestine that ends at the anus.

Regression--Returning to an earlier less mature behavior pattern.

Respiration--Process of breathing.

Rhinitis--Inflammation and swelling of the lining of the nose.

Rubella--Known as German Measles; an acute infectious disease spread by droplet infection.

S

Scabies--A contagious skin condition caused by mites that burrow under the skin; characterized by tiny, thread-like blisters that itch.

Schizophrenia--Sever emotional disorder, characterized by misinterpretation, retreat from reality, experiences of delirium, hallucination; individual loses ability to tell fact from imagination.

Sclera--White tissue covering all of the eyeball except the cornea.

Scrotum--Sac-like structure, located behind the penis, which holds the testicles.

Secondary effect--Additional effect of the medication besides the one for which it was intended.

Sedative--A drug having a calming effect, relieves anxiety and tension, being replaced by tranquilizer (less likely to cause drowsiness or dependency).

Sediment--Solid particles in the urine.

Seminal vesicles--Pouch-like structures, behind the bladder, which store sperm.

Sensory system--Receives outside sensations and relates these sensations to the proper nerves.

Side effects--Effects other than the effects for which a drug was given. These effects can be normal and expected or they can be abnormal and dangerous. Side effects range from drowsiness to rashes, swelling, and vomiting.

Sinus--Air cavities in the skull that open into the nasal cavities.

Slander--A malicious statement of report.

Somnolence--Drowsiness, sleepiness.

Sprain--Wrenching of a joint, with partial rupture of its ligaments. More severe than a strain and requires longer recuperation.

Standard of Care--A description of conduct that illustrates what a reasonably prudent person would have done, or would not have done, under similar circumstances.

Sterile--When it has no germs or bacteria on it.

Stimulant--An agent that promotes the activity of a body system or function (example amphetamines and caffeine).

Strep throat--A severely inflamed and infected throat.

Stress--Circumstances, physical or mental, that cause strain or tension.

Suppositories--a solid medication designed to melt within a body cavity other than the mouth.

Syncope--A brief loss of consciousness.

Systemic action/infection--Affecting the entire body.

T

Tablet--Dried, powdered medication pressed into shape.

Tachycardia--Excessively rapid heartbeat, usually applied to a pulse rate above 100 per minute.

Tardive Dyskinesia--Involuntary, repetitive useless movements such as spasms, oculogyric crisis, protrusion of the tongue, stiff neck, and inability to swallow that occur almost continuously during waking hours but cease during sleep.

Testicles--Also called testes, produces testosterone and sperm cells for reproduction.

Tetanus--Known as Lockjaw; an acute infectious disease often caused by puncture wounds. Often fatal.

Thrombophlebitis--Inflammation of a vein that results in the formation of a clot.

Tic Douloureux--Spasm of a nerve in the face.

Tinnitus--A sound in the ears, such as buzzing, ringing, or whistling.

Tolerance--The ability to withstand the effects of a drug, after single or multiple administrations, without showing adverse effects.

Topical--pertaining to a particular spot; local.

Toxic effect--Effects of medications that become poisonous to the body.

Trade name--The name, given to a manufacturer, by which a medication is known.

Tranquilizers--A drug that produces a calming effect, relieving anxiety and tension.

Transdermal patch--Adhesive bandage containing medication.

Tremor--Involuntary trembling or shaking.

Tuberculosis--Communicable acute or chronic infection caused by mycobacterium tuberculosis.

Turgor--Normal fullness and elasticity of the skin.

U

Universal precautions--Treatment of all blood and bodily fluids as if they were contaminated (blood and bodily fluid isolation), proper disposal of needles.

V

Vagina--The canal leading from the vulva to the uterus in the female.

Vas deferens (ductus deferens)--Tube that carries sperm to the seminal vesicles.

Vasodilators--Drug that increases the blood supply to the brain and other parts of the body.

Vertigo--Dizziness.

Voiding--Eliminating urine.

W

Withdrawal--The physiological readjustment that takes place upon the discontinuation of a medication.