

**HEALTH
AND
MEDICATION
ADMINISTRATION MANUAL
FOR INDIVIDUALS WITH
DEVELOPMENTAL DISABILITIES**

**A SELF-PACED STUDY GUIDE AND REFERENCE
MANUAL**

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TABLE OF CONTENTS

I. INTRODUCTION	
A. Purpose	1
B. How to Use This Manual	2
C. Other Sources of Information.....	2
II. THE ROLE OF THE CARE GIVER IN DRUG THERAPY.....	4
Self-study Questions Sections I and II.....	6
III. MEDICATION USE.....	7
A. Purposes of Medications	7
B. Generic vs. Brand Names	7
C. Over-the-Counter vs. Prescription	7
D. Controlled Substances	8
E. Storage of Medications	9
F. Destroying Medications	10
G. Dosage Forms of Medications	10
1. Oral Dosage Forms	11
2. Swallowing Problems	12
3. Procedure for Mixing Medications with Food	12
4. Special Circumstances	13
5. Topical Dosage Forms.....	13
6. Injection or Parenteral Forms.....	14
H. Monitoring Medications	14
I. New Prescriptions.....	14
J. Home Medications.....	15
K. PRN Medications	15
Self-study Questions Section III.....	20
IV. ADMINISTRATION OF MEDICATIONS.....	22
A. Pharmacy Labels	22
B. General Guidelines	22
C. Principle Aspects of Universal Precautions.....	24
D. Safety in the Skill of Administering Medications	26
E. Abbreviations.....	28
F. Procedures and Documentation	30
1. Filling out the MAR.....	32
G. Errors in Medication Administration.....	39
Self-study Questions Section IV	44
Practice MAR Questions.....	48
Practice MAR Error Questions	57

V. THE ROLE OF THE TRAINER.....	63
A. Normalization, Rules, and Laws	63
B. Teaching Self-Medication Skills	65
VI. CATEGORIES OF MEDICATIONS	68
A. Analgesics.....	68
Opioids (Narcotics) table.....	70
B. Anti-infective Medications	71
C. Medications for Behavior and Psychiatric Symptoms.....	73
1. Antipsychotic Agents	74
2. Antidepressant Medications.....	77
3. Antianxiety Drugs.....	77
4. Sedative-hypnotics	77
5. Stimulants	80
D. Cardiovascular Drugs	81
1. Antihypertensive Drugs.....	81
2. Treatment of Hyperlipidemia	82
E. Respiratory Drugs: Inhalers.....	83
Self-study Questions Section VI	84
VII. SEIZURE DISORDERS (EPILEPSY).....	85
A. Causes of Epilepsy.....	85
B. Types of Seizures	86
1. Partial Seizures.....	86
2. Generalized Seizures	88
3. Status Epilepticus	89
C. First Aid for Seizures.....	89
D. Documentation	90
E. Following the Seizure	91
F. Faking Seizures.....	91
G. Influencing Factors	92
H. Treatment	93
Self-study Questions Section VII	97
VIII. STROKES AND TIA'S	99
A. TIA'S	99
B. Strokes	99
Self-study Questions Section VIII	103
IX. DIABETES MELLITUS	104
A. Type 1 Diabetes Mellitus	104
B. Type 2 Diabetes Mellitus	105
C. Glucose Testing.....	105
D. Long-term Health Complications	106

E. Hypoglycemia	107
F. Procedure: Testing Blood Glucose Levels	108
Self-study Questions Section IX	109
X. GASTROINTESTINAL SYSTEM	110
A. Gastroesophageal Reflux.....	110
B. Choking	113
C. Constipation.....	115
Self-study Questions Section X	118
XI. ASPIRATION AND ASPIRATION PNEUMONIA.....	120
A. Predisposing Conditions	120
B. Classification	121
C. Prevention	122
D. Gastric Feeding (PEG placement).....	124
E. Post-pyloric feeding (jejunostomy).....	125
Self-study Questions Section XI	126
XII. ALLERGIES	127
A. Allergic Rhinitis (Seasonal Allergies)	127
B. Anaphylaxis	129
Self-study Questions Section XII	131

HEALTH AND MEDICATION ADMINISTRATION MANUAL APPENDICES

Appendix A1: Answers to Self-study Questions.....	A2
Appendix A2: Answers to MAR and MAR Error Questions.....	A8
Appendix B: Glossary.....	A19
Appendix C: Instructions for Specific Dosage Forms.....	A24
A. Administering Oral Medications.....	A24
B. Procedure for Administration of Topical Medications.....	A26
1. Eye Drops.....	A26
2. Eye Ointment.....	A28
3. Ear Drops.....	A29
4. Nasal Medications.....	A30
5. Throat Sprays.....	A31
6. Inhalant Medications.....	A32
7. Creams/Lotions/Ointments for Use on the Skin.....	A35
8. Aerosol Medications for Use on the Skin.....	A36
9. Transdermal Patch.....	A37
10. Vaginal Medications.....	A38
11. Rectal Medications.....	A40
Appendix D: Dietary Fiber Tables.....	A42

Appendix E: Sample Documentation Forms.....	A44
Appendix F: Drug Classification Tables.....	A48
Pain Medications.....	A49
Infectious Diseases.....	A52
Nervous System.....	A55
Psychiatric.....	A58
Cardiovascular.....	A62
Respiratory.....	A66
Gastrointestinal.....	A70
Endocrine.....	A73
Genito-urinary.....	A76
Ear, Eye, & Skin.....	A78

I. INTRODUCTION

A. PURPOSE

This manual is designed to inform and train staff who assist and supervise in the self-administration of medications by persons with developmental disabilities. It is intended to teach you enough to recognize problems when they occur and to know what actions to take in response to these problems. The manual is intended to provide an understanding of the responsibilities of service consumers in taking medications and to help you teach such responsibilities to these persons. It does not, nor can it, include everything that you will need to know.

Let's talk about some terms before we go any further. The first paragraph contains two phrases which will have irritated some people: "persons with developmental disabilities" and "service consumers". No negative connotation was intended. Many other terms have been used over the years such as consumer, client, customer, the developmentally disabled, developmentally challenged, and service recipient. The term patient is used in medical circles. The terms individual and person are less specific. Not everyone agrees on which term is best, but we must have a term to refer to this group of individuals. The preferred term changes with time. This manual uses many of these terms to indicate the people we are serving. Please realize that no negativism is intended.

In order to become medication certified, you must be able to study and understand the information in this manual and then pass a written test. It may seem that the amount of information in this manual is overwhelming. However, much of the information is for reference. You will notice that there are no questions in the self-study sections on some of the information presented. The study questions cover the areas which you need to know in order to pass the test. You are encouraged to discuss information in this manual with others as you are learning the material. **However you will not be given any assistance with reading or understanding the material while you are taking the test.** It is necessary for staff to be able to read in order to safely assist with the administration of medications, and be able to write in order to change medication administration records as needed to reflect changes in physician orders. You must also be able to perform these tasks while in a noisy, distracting environment as is often the case at group homes. Therefore, it is a requirement that you have the ability to read, comprehend, and supply a written answer to the questions that are presented. The test may be given in a group setting and you must be able to block out the surrounding distractions and be able to concentrate on the test.

B. HOW TO USE THIS MANUAL

This manual is designed to be self-instructional; that is, it is intended to be used by you both as the teacher and the learner. Each of the sections contains specific information followed by questions to check on what you have learned. The questions are true/ false, matching, multiple choice, and fill-in-the blank. Answers for these questions are located in the appendices at the end of this manual.

Carefully read the information in each section and then write your answers to the section questions on a separate piece of paper or make a copy of the test pages and fill in your answers on that. (We encourage you to write your answers on separate paper, because that will allow others to take the tests without your answers being visible.) Check your answers in the answer section in Appendix A. If you are sure you have learned all of the important information, then move ahead to the next section. If you miss any questions or do not understand them, reread the appropriate material in that section and test yourself again before proceeding.

C. OTHER SOURCES OF INFORMATION

This manual cannot possibly provide all of the information about medications you will need to know. It is not intended to do so, nor would it be possible. It is intended to provide:

- general background information on drugs;
- guidelines for medication procedures for you as a care giver for individuals with developmental disabilities;
- some specific information about specific groups of medications most commonly used by consumers
- drug information which is specific to consumers; and
- medical information that impacts your role in assisting with medications.

There are, however, several good resources available to you. The companion volume, *Essential Guide to Prescription Drugs*, provides more detailed information about specific medications. There are also several good publications available for the layperson. One of these is the *United States Pharmacopeia Dispensing Information, Volume II, Advice for the Patient*. For order information, contact the United States Pharmacopoeial Convention, Inc., 12601 Twinbrook Parkway, Rockville, MD 20852, (301) 881-0666 or go on-line and type in USP DI. It may also be available at a local library. This book is published annually and has several updates during the year. It contains information on almost every drug marketed in the USA, is written in lay language, and provides the needed information for the safe and effective use of medications.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Introduction -

When using these books, one must remember that writing about highly technical, scientific information in lay terms is a task which is challenging in the extreme. You may find some of the information confusing or difficult to understand. Some information may even seem to contradict itself. It is for these reasons that professional people are your most reliable and best source. A conversation which allows clarification of statements and answers to questions allows for more extensive and more effective communication.

Your pharmacist is probably the most readily available, knowledgeable person who can answer questions about the purpose, side effects, toxicities, method of administration, duration of therapy, and drug-drug or drug-food interactions. You probably have professional contact with the pharmacists who supply your medications. They are often available by telephone. Pharmacies are often open into the evening hours and on weekends; some of the larger hospitals have pharmacists on duty twenty-four hours a day. Some pharmacies also have emergency numbers for after-hours.

A physician or registered nurse can also address many of these questions. Sometimes the physician is busy and difficult to reach, but most have some kind of call system for emergencies. Many of you may know nurses who work with you and your consumers who may be able to provide information or answers to your questions.

A useful source of updated information regarding new meds is available at the following website: healthtouch.com/level1/p_dri.htm.

This website cannot be considered as a complete source for specific drug information. Listings for medications do not include all intended uses or known side effects. Some information may be difficult to understand. If you have questions or concerns about a medication, you should always talk to a medical professional.

II. THE ROLE OF THE CAREGIVER IN DRUG THERAPY

An active drug in its final dosage form is called a pharmaceutical. The term pharmaceutical is derived from the Greek word *pharmakon* which was used to refer to both a medicine and a poison. This should help remind us that drugs are two-edged swords. When used appropriately they can relieve the signs and symptoms of disease and thus relieve suffering. But when used carelessly, drugs can be toxic, producing mental and/or physical distress or even death.

Even when used properly, the response to medication is not predictable. Medications are taken to obtain a therapeutic effect. Unfortunately, no medication has only one effect. The unwanted *effects* are called side effects or adverse reactions. Therefore, every time a medication is taken, it should be considered an experiment. As with any experiment, the outcome of drug therapy must be observed carefully and documented.

Your role as a care giver is to assist the consumer with taking his/her medication. Your role is two fold. You are teaching or training the consumer to take his/her medication properly. You are also responsible for the consumer's proper administration of medication as prescribed. Safe administration of medications requires knowledge as to a drug's:

- mode of action (how the drug works)
- side effects
- toxicity (damaging effect of the drug)
- range of dosage (which can vary according to each person's response to the medication)

The wise use of medication requires an accurate diagnosis, accurate knowledge of the medical and psychosocial condition of the patient, thorough drug knowledge and careful monitoring. The physician selects therapy with medications based on:

- '' best drug for the
- '' right person, at the
- '' right dose at the
- '' right time, by the
- '' right route, using the
- '' right position, and
- '' right texture and consistency

These things are primarily the responsibility of the medical professionals. You, as a CARE GIVER, can be of great assistance to these individuals.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
The Role of the Caregiver in Drug Therapy -

It is often said that 90% of diagnosis is understanding the patient's medical history. Some consumers are unable to provide this history in great detail to the physicians, pharmacists and nurses. So you must. Some things are obvious, such as allergies to medications. Others may not be quite so apparent. For example, knowing that a person has frequent problems with constipation may influence the prescriber's decision about which antidepressant is most appropriate for this individual. Other examples might be:

- a person with difficulty swallowing needing a different form of the drug;
- a person who would not be able to cooperate with having eye drops administered; or
- an individual with a past history of picking at their stool may not be the most appropriate candidate for suppositories.

Medical professionals need a list of all the medical problems and psychosocial diagnoses, past surgeries, allergies, medications (prescription, nonprescription and health foods or supplements), any physical or mental limitations, and an accurate description of the current problem.

With follow-up visits, the physician will be evaluating the response to medication and deciding whether to continue it, change dosage, or change drugs. It is difficult to get an accurate picture of the person in a fifteen minute contact in a physician's office. You, the CARE GIVER, often spend many hours with the person each day. You can help the medical professionals by describing changes in any signs or symptoms of the client, any side effects that you have observed, and any problems that the client may have taking the medication. One side effect, the significance of which is often overlooked, is sedation. The prescriber may not be aware of the interference this may cause with training programs. The advantages or therapeutic effects of medication must always be balanced with the disadvantages or adverse effects.

Self-study Questions Sections I and II:

1. Your role as care giver assisting with medication is to:
 - a. Help the consumer to take medication properly.
 - b. Prescribe medication.
 - c. Report problems from the medication to the physician.
 - d. Assure medication is taken properly.
 - e. a, b, d
 - f. a, c, d

2. You can assist physicians in decisions regarding which medication is appropriate for a given problem. Give two examples of information about a client that would be helpful to the physician:
 1. _____
 2. _____

3. At a follow up visit to the physician after a new medication is started, it is very important for the physician to be aware of any new problems that may be occurring. List two possible problems or side effects that you would report to the physician.
 1. _____
 2. _____

4. T F Unwanted effects of a drug are called side effects.

III. MEDICATION USE

A. PURPOSES OF MEDICATIONS:

Medications or drugs are commonly used for therapeutic purposes in today's society. It is important to remember the goal or purpose of taking medication. Medications are rarely curative. Usually they are able only to eliminate symptoms of a disease, not eliminate the disease. For example, a decongestant can eliminate your runny nose, but it doesn't cure your cold. Anticonvulsants are used in the same way. They prevent the symptom—the seizure—but they do not cure the disease or disorder that causes the seizure.

B. GENERIC VS. BRAND NAMES:

Medications can be referred to by two names. The generic name can be used by any manufacturer and generally identifies the active ingredient in the drug product. The brand name (or trade name) can be used to refer only to the product of the company who registered the trade name. For example, soap (generic name) can refer to a variety of products you might see in the store. But Dial® is a specific product containing soap. Bayer® is a brand name, aspirin is a generic name. By convention, brand names are usually capitalized and identified with the registered trademark symbol "®". Throughout this manual, medications will be identified by both their generic names and brand names.

Many generic products are just as good as the brand name product, but are generally less expensive. Even when a prescription is written for a brand name, the pharmacist may substitute a generic medication if certain circumstances are met. The prescription will then be labeled with the generic name. If this creates any question about whether this is the same medication that was ordered, call the pharmacy and check the names.

C. OVER-THE-COUNTER VS. PRESCRIPTION:

Medications are also classified as either over the counter (OTC) or prescription only. OTC or nonprescription products may be purchased in pharmacies or certain other retail stores by an individual without a prescription. Prescription only (or legend drugs) may only be purchased from pharmacies with a prescription from an authorized prescriber. These medications have a "legend" printed on the label: "Federal law prohibits dispensing without a prescription." You may not see this legend because the pharmacist usually repackages and relabels the medication for a specific person with instructions taken from the prescription.

This distinction is not relevant in a community home setting. Because you are acting as a care giver, you may only administer medication with the order of a physician, whether the medication is OTC or prescription. The reasons for this are as follows: OTC medication is classified as such by the U.S. Food and Drug Administration (FDA) because the FDA has determined that it can be used safely and effectively for self-treatment by the average non-medically trained person. Persons with developmental disabilities are not average non-medically trained persons and cannot determine their own self-treatment. You are not medically trained so you cannot determine their medication needs. Therefore, only medically trained professionals can determine the medication needs of the persons you serve.

D. CONTROLLED SUBSTANCES

Another medication classification is controlled substances. The Federal Controlled Substances Act was put into place to identify and control the access to substances that have a high potential for abuse. These substances are placed into one of five categories referred to as Schedule I to Schedule V. The lower the number (schedule) is, the higher the potential for abuse. These substances have additional restrictions placed on them. Most of these restrictions will not be apparent to you, but there are two restrictions of which you should be aware. First, any prescriber must obtain a DEA (Drug Enforcement Administration) number to be able to prescribe these drugs. This registration specifies which schedules this prescriber can legitimately prescribe. The second is restrictions on refills.

Schedule I substances have a very high potential for abuse and also do not have a legitimate medical use. It is illegal to manufacture, possess, or distribute these substances without a special license. Only researchers will have access to these substances. Heroin and ecstasy are examples of drugs in Schedule I.

Schedule II substances also have a very high potential for abuse, but do have a legitimate medical use. Many of the opioid pain relievers (eg. morphine, oxycodone (OxyContin®)) are in this schedule. Methylphenidate (Ritalin® and others) and amphetamines (Dexadrine®, Adderall®) are also Schedule II. One of the extra controls placed on these agents is that a written prescription on special paper is required; no telephone or faxed prescriptions are allowed. There are special procedures in place to accommodate emergencies when a written prescription is not feasible. You will need to communicate with the prescriber and pharmacy if an emergency prescription is needed. A second extra control is that refills are not allowed. A new, written prescription is required each time.

Schedule III, IV, and V medications can be written, faxed, or phoned to the pharmacy and refills are allowed. Each of these prescriptions expires six months after the date it is written whether or not all of the refills have been used. Schedule III substance are mostly combinations of acetaminophen or aspirin with codeine (eg. Tylenol® No. 3). Schedule IV medications include sleeping agents

(eg. zolpidem (Ambien®) and benzodiazepines (eg. diazepam (Valium®), clonazepam (Klonopin®), and lorazepam (Ativan®)). There are few Schedule V substances. Some codeine containing cough and cold preparations where the codeine is combined with other medications are Schedule V (eg. Robitussin AC®) and are even over the counter in some states. They are prescription-only in Montana. Diphenoxylate with atropine (Lomotil®), which is used to treat diarrhea, is also schedule V.

E. STORAGE OF MEDICATIONS:

Medications can break down if not stored properly. Medications also affect body function and can be harmful if not taken properly or if taken by someone other than the person for whom they were prescribed. There are three important factors which must be met when storing medication: environmental conditions, security/access, and convenience.

Medications are chemicals. Like all chemicals they may undergo chemical reactions or breakdown thus deactivating the drug. Conditions which promote chemical decomposition of most drugs include **heat, moisture, light, air and time**. How much each of these factors affects a medication depends on the specific chemical. Therefore, most medications should be stored in a cool (room temperature), dry, and dark place, unless otherwise directed. The bathroom medicine cabinet is the worst place to store medication as it tends to be the moistest and warmest place in the house. The kitchen is likewise not an ideal storage place as it is also quite warm and moist.

The storage temperature of medication is a common issue. Store medications at room temperature (defined as 59°F to 86°F), although this varies with each medication. Medications requiring storage in the refrigerator should generally be kept at a temperature between 36°F to 46°F to maintain their potency. Refrigerate only those medications that have this instruction. Refrigerating other medications could cause them to lose effectiveness because of low temperatures and high humidity. In general, freezing should be avoided, although there are exceptions.

1. **“Dry”** usually means avoiding moist, damp places such as bathrooms or near dishwashers. Medication containers are made of watertight material. Medication containers should be closed tightly after each use, especially during hot, humid weather.

2. **Light** can also deactivate some medications. Medication containers are usually opaque to prevent light from coming into contact with the medication.

3. **Air** contains oxygen. Oxidation is a chemical reaction which can inactivate some medications. Keeping the container closed tightly limits the exposure of the medication to oxygen.

Controlling exposure to heat, moisture, light and air can extend the life of medication, but chemicals eventually break down over time just as food spoils or

bread molds. Medications have an expiration date. After this date, a new medication should be obtained.

If a medication requires special storage, your pharmacist should inform you of this and there will be instructions regarding special storage on the pharmacy label. Otherwise, the following guidelines should be followed:

- a. Keep all medications out of harm's way. Medications should be locked away from children and others who are not responsible.
- b. Store medications in their original containers.
- c. Medication should be kept dry and cool. Store away from heat and direct sunlight.
- d. Do not let liquid medications freeze.
- e. Destroy all unused or outdated medications.
- f. Always keep the lid on the medication container tightly closed.
- g. Never mix different medications together in one container.

F. DESTROYING MEDICATIONS

There are many situations in which there will be "left-over" medication. The medication may be out of date or discontinued. Perhaps the dosage was changed, requiring a different size dosage form. The consumer may have moved to another facility, leaving medications behind. Whatever the reason, the medication must be disposed of properly. A medication should never be kept just in case it is restarted. Medications should never be used for other consumers. These things tend to lead to medication errors.

The best way to dispose of unneeded medications is to return it to the pharmacy, however many pharmacies do not offer this service. Also, note that they cannot reuse the medication, so don't expect a refund. Your facility should have a policy in place stating the proper disposal of left-over medications which has been approved by a nurse and a pharmacist. Any medication that is disposed of will need to be documented properly. Therefore having a documentation form that includes all the necessary information including signatures of the person disposing of the medication and a witness is important. An example of such a form is found in Appendix E.

Never flush medications down the toilet or down a drain. A red sharps container may be used for medication disposal. Tablets should be crushed so that there is no risk of them being taken by anyone.

G. DOSAGE FORMS OF MEDICATIONS:

Medications come in many different forms, almost too many to count and certainly more than can be described in this manual. Different dosage forms are used for different routes of administration or to change the rate or extent of absorption of the medication. Routes of administration may be classified into three broad groups: oral, topical, and injection.

1. Oral Dosage Forms:

The most commonly used route of administration is oral (by mouth). PO (per os) is the Latin abbreviation often used. Most oral medications are in the form of tablets or capsules with which you are familiar. Since these medications must be dissolved before they can be absorbed and fluid is required for this to occur, they are swallowed with a glassful of water or other liquid. Optimally, a full glass (8 fluid ounces) of liquid is taken with the medication. Taking sufficient fluid with the medications also helps minimize stomach upset.

Oral tablets and capsules may be designed as

- Immediate release (IR)
- Delayed release (DR)
- Sustained release (SR)
- Extended release (ER, XR, or XL)
- Controlled release (CR).

Many medications come in more than one oral dosage form. They often have the same brand name and can be distinguished only by the letters after the name. These letters are important and you will need to pay attention to them. For example, Bupropion is available as an immediate release form (Wellbutrin®, given three times daily), sustained release (Wellbutrin SR®, given twice daily), and extended release (Wellbutrin XL®, given once daily). These products are not interchangeable even though they contain the same drug, bupropion.

Tablets may also come in different forms:

- Chewable forms which are designed to be chewed in the mouth before swallowing (eg. Calcium carbonate (Tums®))
- Sublingual forms which are designed to be dissolved under the tongue (Nitroglycerine used to treat angina or chest pain)
- Lozenges are like hard candies in that they are dissolved by sucking on them and swallowing the liquid produced. A common example is the throat lozenges you may buy for a sore throat (eg. Cepacol®).

There are also many liquid forms of medication designed to be taken orally. These liquid forms are useful for those who have swallowing difficulties.

- Check the label to see if it requires refrigeration
- Check to see if it must be shaken before each use. To be sure the correct amount of active ingredient is given; shake the bottle vigorously for 15-30 seconds every time the medication is administered.
- Always use a medicine cup to measure liquid medication. These are available at most pharmacies. Using a household teaspoon as a measuring tool is very inaccurate.

2. Swallowing Problems:

Many people have difficulty swallowing whole tablets or capsules or need a dosage less than one tablet in size. Crushing tablets, emptying capsules or cutting tablets is commonly done and is acceptable for many medications.

Many tablets are scored (have an indented line across them) which allows them to be broken with the fingers easily. Cutting tablets which are not scored is most easily accomplished with a tablet cutter. Tablet cutters can be purchased at most pharmacies.

There are also many medications which cannot be cut or crushed. In general, any medication which is extended release, sustained release, sustained action, slow release, time release, delayed release, repeat action, or enteric coated should not be cut or crushed, but there are exceptions.

When there are problems with a form of medication, it is best to call the pharmacy for clarification. Never just assume it is acceptable to cut or crush a medication. Many medications come in liquid forms which can be substituted for a tablet. Also, sometimes a similar medication is available in a more convenient dosage form: the pharmacist can call the physician to see if this other drug could be used instead.

3. Mixing Medications with Food:

To help a consumer more easily take a medication, it is sometimes necessary to mix that medication with food. Sometimes the tablet is crushed or the capsule contents are emptied into food in order to ease swallowing. Sometimes simply putting the whole tablet into a tablespoon of food is enough to help the consumer swallow it. Foods often used are applesauce, pudding, and ice cream. Any food that is soft or can be mashed such as bananas can be used. However, do not mix medications with peanut butter as the consistency of peanut butter is difficult for many to handle and can cause choking. Also, if aspirated, peanut butter is not cleared from the airways easily. There have been instances of death associated with choking on peanut butter.

When you mix medications with food, only use a small amount of food to be sure that the entire amount of medication is swallowed. Mixing it in a medicine cup is best. The entire amount of food the medication is mixed with should be given and then followed with a glass of water to help make sure that the entire amount of medication gets to the stomach and is absorbed.

The food the medication was mixed with must be finished at the time you are assisting with medication administration. You cannot place a container of food mixed with medication in the refrigerator hoping that the consumer will finish it later. This medication could accidentally be taken by another consumer or never taken at all thus the consumer has missed his/her medication.

4. Special Circumstances:

Some medications need to be taken on an empty stomach. Food and beverages in the stomach may interfere with absorption or slow the time it takes them to begin working. To avoid this, take the medication either one hour before, or two hours after, eating or drinking. All medications should be taken with a full glass of water or liquid.

Some medication may change the color of urine or stool. This effect is not harmful and will stop when the medication is discontinued. If you are unsure, ask the pharmacist; otherwise any unexpected change should be reported to the physician.

Some medications, such as sulfa drugs and tetracyclines, may cause an increased sensitivity to sunlight, causing the skin to burn more easily. During the time this medication is taken, it is important to limit exposure to the sun and wear protective clothing and sunscreens when in the sun.

5. Topical Dosage Forms

Topical administration means something is applied to a surface such as skin. These include ointments, creams or patches applied to the skin; ophthalmic ointments or drops applied to the eye; sprays and drops applied into the nose or ears; vaginal ointments, creams, and suppositories inserted into the vagina; rectal creams, ointments, suppositories inserted into the rectum; and many others. Even though these are applied to the surface, they may be absorbed and produce systemic (throughout the body) effects. At other times they are intended to produce local effects only.

Medications applied to the skin come in numerous dosage forms. These include solutions, suspensions, gels, oil in water emulsions, water in oil emulsions, creams, ointments, and pastes. The type of product affects the absorption of the medication. There are also some other topical dosage forms for the skin. Patches are used to deliver medication for either local effect (eg. lidocaine patch for pain) or systemic effect (eg. nicotine patch for smoking cessation). Sprays are sometimes used to apply medication (eg. Suntan products). Shampoos are used to treat scalp conditions.

Products designed to be applied to eyes, ears, nose, vagina, or rectum are topical dosage forms because they are applied to a surface. They may be used to treat local problems (eg. inflammation in the eye) or intended to be absorbed to treat a systemic problem (eg. suppositories for treatment of nausea and vomiting). Each of these products is formulated specifically to meet the needs of the site of application so that it is not irritating.

6. Injection or Parenteral Forms

The third category is injection or parenteral. Medication may be injected into muscle (intramuscularly or IM), into a vein (intravenously or IV), under the skin (subcutaneously), or in other ways. These forms of medication are used to get medication into the body when it is not possible to give them orally such as when someone is hospitalized and cannot take medications by mouth for some reason. Also, at times medications are not absorbed correctly in the stomach so would need to be injected in order to get into the blood system. Many insulin products are administered subcutaneously for this reason. You will not be administering these forms of medications except possibly something such as an EpiPen used in an emergency life threatening situation.

H. MONITORING MEDICATIONS

All medications require monitoring and specific written documentation of their use. Monitoring is done to be sure the drug is effective for its intended purpose as well as to prevent drug-induced problems. Often effectiveness can be determined by simply observing the disappearance of symptoms. Sometimes the concentration of the drug in the blood is measured to see if an effective dose is reached and to prevent toxicity.

You should be aware of possible side effects of medications and these should be documented. Side effects may be physical or emotional. They are often unwanted but some drugs are prescribed to utilize potential side effects in treatment. Side effects may be mild (nuisance) side effects or they can be quite serious. Any symptom may be a drug side effect. If a symptom occurs after starting a new medication, consult the pharmacist, a nurse, or the physician to see what can or should be done about it.

I. NEW PRESCRIPTIONS

Whenever a consumer is seen at a physician's office, you should be able to supply the physician with needed information such as that person's current medications, including any over-the-counter or homeopathic substances being taken, as well as the medical conditions of that person. You should be able to discuss your concerns and observations regarding the consumer with the physician. When a new medication is prescribed, you and the consumer should be supplied with the following information either by the physician or the pharmacist:

1. What is the purpose of this medication? What signs or symptoms do you expect this medication to affect and how long should it take before you see changes?
2. How much should be taken and how often?

3. Can it be taken with meals or food?
4. How long should it be taken? Is it refillable?
5. Are there any special storage instructions?
6. What are possible side effects? What should or can be done about them?
7. Are there any interactions with other medications that the person is taking?
8. Does the person need to return for a follow up visit or get blood tests?

J. HOME MEDICATIONS

There are times when a consumer is to be away from the facility on a home visit with family or friends or on an outing. It is important that the medications go with the consumer. Each provider may have separate guidelines for how the medication is sent. If medications come in cassettes it is necessary to send the entire cassette with the consumer. If there is time, some pharmacies may repackage medication and send only enough medication to last until the consumer's return. No matter how the medication is sent, it is important to send a patient information sheet for each medication and a copy of the Medication Administration Record (MAR) with written instructions as to each medication's dosage and the time that it is taken so that family and friends are able to understand when the medications should be taken. The care giver should review the medication instructions with a family member or responsible person to ensure that they are understood.

While that consumer is gone, putting something such as an "H" to designate home visit, should be written on the MAR for those doses that are not given at the group home.

Upon return, the family member or responsible person should be asked about the medications. If any dosage was missed, this should be documented in the records. Also any possible reactions to the medication or other medical concerns should be asked about and documented.

K. PRN MEDICATIONS:

PRN is an abbreviation for the Latin *pro re nata* meaning "when needed" or as more commonly stated, "as needed". It is used when a medication is to be given only under certain circumstances rather than on a regular schedule. The ability to use PRN medications often means timely treatment for our consumers. However, each medication requires a written protocol with clear guidelines regarding the use of that medication. The guidelines need to specify criteria such as a symptom, i.e. headache, temperature over 100 degrees F, etc. The Developmental Disabilities Program's policy on PRN medication is as follows:

1. OVER THE COUNTER PRN MEDICATIONS

- A. Over-the-counter (OTC) medications are those that can be purchased without a prescription from a doctor. These include such things as vitamins, ibuprofen, aspirin, antihistamines, etc. as well as herbal remedies and other homeopathic products.
- B. All OTC medications for individuals in Developmental Disabilities services must have a physician's written order or approval for their use as well as guardian consent if applicable, except in the event of an emergency. These medications must be reviewed and approved by the physician on an annual basis.

It is necessary to have an order for OTC products because:

1. It is illegal to use OTC products without a physician's order for anyone but yourself or a dependent.
 2. There may be harmful interactions between OTC medications and any prescribed medications being taken by an individual.
 3. Primary care physicians are usually aware of any allergies or other health concerns of the individual which would rule out the use of certain OTC products.
- C. Each OTC medication must have a protocol for its use. This protocol should include specific directions for use as well as contain the following:
1. The **name of the individual** receiving the medication.
 2. The **name of the PRN medication** including both generic and trade names to avoid confusion.
 3. Under what **conditions** the medication is used such as physical or behavioral indicators. For example, an antihistamine may be used for an allergy if the person has a runny nose, itchy eyes, etc. These should be specific and individualized.
 4. The **route** of administration: orally, topically, rectally, etc.
 5. The **amount** of medication that is to be given: two tablets, one applicator, three drops, etc.
 6. **How often** the medication can be given. This includes:
 - the maximum dosage that can be given within a 24 hour period. (example, "do not take more than 6 tablets in 24 hours")
 - the minimum amount of time allowed between dosages (example, "do not take more than 2 capsules every 4 hours")

7. The **length of time** the medication can be used or under what conditions and time frame the medication may be used before the nurse or physician should be notified. Examples:
- “Notify physician if med is taken more than three days in a row.”
 - “If rash does not clear in 5 days, notify physician.”
 - “If nausea and vomiting persist for more than two days notify physician.”

The physician will need to individualize these requirements.

8. Any **specific instructions** or warnings that may accompany a medication such as “Do not crush”, “Do not give with a specific medication”, or “Must be taken with food”.
9. Potential **side effects** that can occur when taking the medication. These include both physical and behavioral indicators.
10. **Documentation** of all medications that are given must occur on the Medication Administration Record (MAR). The information required includes:
- a. Name of medication
 - b. Time and Date of administration
 - c. Dosage taken by the individual
 - d. Reason for administering the medication
 - e. Staff initials
 - f. In some cases, documenting the results that occurred once the medication was given is also needed.
11. **Incident reports** must be written and submitted per Incident Management Policy regarding prn medications.

2. PRESCRIPTION PRN MEDICATIONS

- A. These medications can only be obtained through the prescribing physician.
- B. When PRN medications which cannot be purchased over the counter are prescribed, the individual’s PSP team must be notified. They can then address any concerns regarding the medication. Although the team cannot override a physician’s order, they may decide to seek a second opinion regarding the use of that medication. At no time should any staff working with an individual request a PRN medication from a doctor except in an emergency situation. Concerns regarding the need for a certain medication should first be brought to the individual’s PSP team with documentation as to the reason for requesting the medication. This includes all PRN medications including those for sleep, pain, allergies, seizures, etc. but is especially important when there are concerns regarding the use of psychotropic medications.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Medication Use -

- C. The use of PRN medications is warranted for many different conditions. However, the use of PRN medications for “behavioral” purposes is highly discouraged. This would include reasons such as “agitation”, “aggression”, “compulsivity”, “property destruction”, “hyperactivity”, etc. At no time should any one person be advocating for the use of such medications without the express written consensus of an individual’s PSP team. This would be considered a chemical restraint and would require an approved right’s restriction.
- D. PRN medication protocols for the use of psychotropic medications must have an objective written into the individual’s PSP.
- E. The PRN medication protocol must be written by the individual’s PSP team and submitted to the Regional Developmental Disabilities Program office for review and approval by the Quality Improvement Specialist. After approval, staff training must occur to ensure that anyone assisting with the PRN order has demonstrated competency to do so. The staff must also be certified to assist/supervise with medication administration.
- F. General rules regarding the use of psychotropic medications:
- PRN psychotropic medications are **never to be used for the convenience of staff** caring for an individual, but must have clear and objective guidelines for use.
 - PRN medications are **never to be used in place of behavioral support strategies.**
 - PRN medications are **never to be used as punishment.**
- G. The PRN protocol must contain the following:
1. The **name** of the individual receiving the medication.
 2. The **name of the PRN medication**, including both generic and trade name to avoid confusion.
 3. The **dosage** of the PRN.
 4. The **route of administration**: orally, IM, etc.
 5. Potential **side effects** of the medication that need to be monitored.
 6. **Signs of overdose**, specifically physical signs and symptoms to look for that may indicate an overdose. The emergency procedure if an overdose is suspected.
 7. The **maximum dosage** the individual may have per occurrence.
 8. The **minimum amount of time** allowed between dosages.
 9. The **maximum dosage or maximum number of times** the individual may take the medication **in a 24 hour period.**

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Medication Use -

10. The **maximum number of times** the individual may receive the PRN in a **designated number of days before the individual's physician** should be notified.
11. The **maximum number of times** the individual may receive a PRN medication in a **designated number of days before the individual's PSP** team should meet to address the issue. This may differ from when the physician should be notified.
12. The **rationale** or reason for the use of the PRN medication. This needs to be thoroughly explained in writing and would include:
 - a. Antecedents: what may act as a trigger for the behavior?
 - b. Precursor behaviors: physical signs, which could include behavioral indicators of pain.
 - c. Target behaviors: must be defined in observable and measurable terms.
 - d. What steps or supports will be implemented to avoid the use of the PRN medication, if applicable?
13. The **initiation date** for the PRN protocol.
14. Who needs to be notified immediately if a PRN medication is administered, if applicable? Does approval need to be obtained prior to administering the PRN medication?
15. Data-recording system, including incident report.
 - o How often the data will be shared with the individual's physician.
 - o How often the data will be shared with the individual's PSP team.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Self-study Questions Section III

Self-study Questions Section III Medication Use:

1. T F If a medication is to be given on an empty stomach, it should be given either one hour before, or two hours after eating.
2. T F You may obtain and use OTC products for the consumers without a doctor's order.
3. T F The bathroom medicine cabinet is the best place to store medications.
4. T F It is permissible to use non-prescribed medications for consumers, as long as they can be purchased over-the-counter.
5. T F Unused medications should be stored just in case they are restarted.
6. T F All tablets can be crushed and mixed with food if the client has difficulty with swallowing.
7. T F It is ok to use a household teaspoon to measure liquid medications.
8. T F Medications which have been prepared but not given to a person because he or she refused, should be returned to the container.
9. T F Sustained-release tablets cannot be crushed or chewed.
10. OTC stands for _____ drugs.
11. Some consumers have a difficult time swallowing pills. Medications are often mixed with foods to ease swallowing. Which of the following can be used to mix medications.
 - a. applesauce
 - b. ice cream
 - c. peanut butter
 - d. pudding
 - e. a, b, d
 - f. all of the above
12. Oral medicine (tablets or capsules) should be taken with how much liquid?
 - a. just a swallow is sufficient
 - b. 1 glassful (8 fluid ounces)
 - c. 1 quart
 - d. a quarter cup
13. Regarding storage of medications, which are true?
 - a. It is ok to store medication on the countertop in the direct sun.
 - b. Unused medications should be stored in case they are needed in the future.
 - c. It is ok to leave the lid on the medication container loose as lids are often difficult to remove.
 - d. Medications should be kept dry.
 - e. Expiration dates don't really need to be followed.
 - f. Freezing medications should be avoided.
 - g. b, f
 - h. d, f

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Self-study Questions Section III -

14. When a consumer is prescribed a new medication, what are some questions regarding that medication that should be answered before leaving the physician's office:
- a. What is the purpose of the medication?
 - b. Can the medication be taken with food?
 - c. What are possible side effects?
 - d. Are there any special storage instructions?
 - e. a, b, c
 - f. all of the above
15. PRN medications, especially psychotropic medications:
- a. are never to be used for the convenience of staff
 - b. are never to be used in place of behavioral support strategies
 - c. are never to be used as punishment
 - d. all of the above
16. A PRN medication protocol must contain the following:
- a. dosage
 - b. potential side effects
 - c. maximum dosage per 24 hour period or for the occurrence for which it is used
 - d. route of administration
 - e. reason for the use of the PRN medication
 - f. all of the above
17. Oral medications may include all except:
- a. tablets
 - b. suppositories
 - c. capsules
 - d. liquids
18. In general, medications that cannot be cut in half include the following:
(name two)
- a. _____
 - b. _____

IV. ADMINISTRATION OF MEDICATIONS

A. PHARMACY LABELS

Medications are dispensed by the pharmacy and must remain in the original labeled container with the following information on the label.

- Person's name
- Medication name
- Strength/dosage of medication
- Route
- Time of administration
- Quantity issued
- Date medication dispensed
- Prescription number
- Expiration date
- Pharmacy name, address, phone number

B. GENERAL GUIDELINES

1. Give only medications that have been prescribed by the physician.
2. Each prescription has a label which has instructions for use. Be sure you understand these instructions. You may call the pharmacy for clarification if needed.
3. When preparing to administer a medication, always check the label to make sure you have the correct medication. A three point check system should be used. **Read the label:**
 - ◆ When you pick up the container
 - ◆ When you remove the medication, and
 - ◆ When you replace the container.

“Read the label” means read the patient's name, the name of the medication, and the dosage. This triple check system helps to prevent errors.

4. The person administering the medications is responsible for knowing the medication's intended use, the purpose for it, and any reactions of side effects commonly seen.
5. The person administering medications is responsible for knowing specific conditions of the person such as allergies, swallowing problems, etc.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

6. All medications must be prepared and administered according to the “seven rights”: **(Memorize these 7 rights; it is mandatory that you can list all 7 of them in any order to pass your test.)**
 - ” **The right person**
 - ” **The right medication**
 - ” **The right dose**
 - ” **The right route**
 - ” **The right time**
 - ” **The right position**
 - ” **The right medium/texture/consistency**
7. Medications must be identifiable up to the point of administration.
8. Avoid distractions when administering medications. Keep your focus on the individual at all times.
9. Privacy is important to many people. Be sure to observe privacy for each individual by not discussing the medications with others, not announcing publically that it is time for the person to take his medications, and do not give the medication in a public place.
10. The person receiving the medication should be told about the purpose of the medication and expected effects.
11. Each MAR must be read carefully. If not clear, refer back to the original physician order or check with the pharmacist.
12. Never take medication from an unmarked or soiled container, or a container that has a label that is not readable.
13. Store medications appropriately. Any change in color, consistency, unusual odor should be reported to the supervisor or pharmacist.
14. Give the medication at the prescribed time and stay with the person until the medication is taken. The window of time is one-half hour before or one-half hour after the prescribed time unless otherwise ordered.
15. Medications which have been prepared but not given to the person for any reason (refusal, absence, etc) are to be discarded. Never return medications to their container. Refused medications must be recorded on the MAR.
16. When administering medications, the principle aspect of universal precautions must be followed.
17. Be sure to accurately document after each dose of medication taken.
18. Make note of any adverse or unusual effects from the medication.

Dealing with interruptions when administering medications:

If you are interrupted when administering medications, take steps to ensure that people are safe and comfortable. You must secure the medications and ensure that no errors are made. If possible, let someone else handle the situation that is interrupting you. If you must leave, return as quickly as possible and get focused again before proceeding with any medications that are left to administer.

Responding to refusals to take medications:

Remember that individuals do have the right to refuse. If possible, try to find out why the medication is being refused and see if you can make a change. This may require observation as well as trial and error in individuals who cannot communicate well. Do not give a second dose of medication that has been spit out. It is impossible to tell what amount was swallowed or absorbed.

C. PRINCIPAL ASPECTS OF UNIVERSAL PRECAUTIONS

1. What are Universal Precautions?

These are steps designed to protect one's self if the possibility of contact with anyone's blood or body fluids exists. Universal precautions are intended to supplement rather than replace recommendations for routine infection control, such as hand washing and using gloves to prevent microbial contamination of hands.

2. Putting Universal Precautions into practice:

1. Prevent injuries from needles or other sharp instruments by:

- a. do not recap needles by hand
- b. do not bend, break, or manipulate needles by hand
- c. place all used, disposable syringes and needles, and other sharp items in a puncture-resistant ("sharps") container for disposal
- d. Locate the "sharps" container as close to the use area as is practical but still safe for the consumers.

2. Protective barriers, such as gloves, can prevent or reduce the incidence of exposure to blood and other body fluids.

- a. Use gloves when contact with blood or other body fluids is anticipated, including the following
 - Assisting clients with bathing

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

- Helping with mouth care such as tooth brushing
 - Handling laundry that is soiled with blood or body fluids
 - Obtaining a specimen (urine, blood, stool)
 - Changing a bandage or dressing a wound
 - Providing skin care such as applying topical ointment or helping with shaving
 - Treating cuts, bites, nose bleeds, burns, or insect stings
 - Cleaning emesis (vomit)
- b. Change gloves and wash hands between individual contacts.
- c. Do not wash or disinfect gloves for reuse.
- d. Replace torn or punctured gloves immediately.
- e. Cover cuts, rashes, or other breaks in the skin with bandages and gloves.
- f. Wear gloves such as general-purpose utility gloves for cleaning areas or instruments involving blood/body fluid contact.
3. The most effective method to prevent and control the spread of disease is proper hand washing.
- a. Remove and secure rings
- b. Use continuously running water
- c. Wet hands and apply soap
- d. Scrub vigorously all surfaces of the hands, including the backs of hands and between fingers, for at least 15 seconds.
- e. Rinse thoroughly
- f. Dry well with a paper towel
- g. Use the paper towel to turn off the faucet
- h. Discard paper towel in the trash can

D. SAFETY IN THE SKILL OF ADMINISTERING MEDICATIONS

<u>Action</u>	<u>Rationale</u>
1. Medication orders must be in writing on the MAR which states the person's name, drug name, dosage, route, and time. (texture and position, as indicated)	1. Written documentation provides for safety.
2. Following universal precautions, proper hand washing before and after administering medications.	2. Good aseptic technique to prevent infections.
3. Place the medication with the MAR.	3. MAR must accompany medication as a means of identification.
4. Never give a medication unless the label is present and clearly readable.	4. Prevents medication errors.
5. Do not touch pills or capsules with bare hands.	5. Good aseptic (free from bacteria) technique.
6. Pour liquids away from label side of the bottle.	6. Prevents messy unreadable label.
7. Pour liquid medications at eye level. The lowest part of the meniscus is the correct level. (When you look at liquid in a cup from the side you will see that there is a crescent formed by the liquid. Line up the lowest part of that crescent or ring for the level you want.)	7. Looking down at glass gives an inaccurate reading.
8. Do not pour liquid medications until ready to give.	8. May deteriorate or evaporate.
9. Do not mix liquid medications together.	9. One may precipitate the other; attractiveness may be spoiled, there may be unpredictable interactions.
10. Shake liquid suspensions for at least 15 seconds before giving.	10. Medication can settle to the bottom but needs to be evenly distributed for correct dosage.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Action	Rationale
11. Give only medications which you have set up or prepared yourself.	11. YOU ARE RESPONSIBLE FOR YOUR OWN ACTIONS.
12. Do not leave medications unattended.	12. Persons may store medications, may forget to take them or take them at the wrong time or another person may take them.
13. Stay with the person while he/she takes medication.	13. Some people may tuck the medication in their cheek, be unable to swallow, may hide the medication or spit it out. You cannot document that the medication was taken if you did not witness it.
14. Chart only medications which you give.	14. YOU ARE RESPONSIBLE FOR YOUR OWN ACTIONS, NOT ANOTHER'S ACTIONS.
15. Make sure that the medication is given by the correct route.	15. May cause injury if given by the wrong route.
16. If you make a medication error, fill out the appropriate Medication Error Form. Errors can be wrong medication, wrong person, wrong dosage, wrong route, wrong time.	16. Legally, you are in a better position if you can show that you promptly recognized the error and took action to remedy it. This is not a punishment.
17. Observe the person's response to the medication.	17. You should be aware of: <ul style="list-style-type: none">• What the physician intends to accomplish with the med.• Possible side effects• Documented allergy to any medications.
18. Document achievement of desired response, document and report any potential adverse responses.	18. Documentation provides for better care as it lets all other support team members know "what's happening". It also provides proof that a certain type and level of care has been provided and who gave that care.
19. Keep medication secured in a locked place.	19. Provides accountability and safety.

E. ABBREVIATIONS

The medical profession utilizes many abbreviations when communicating through notes, prescriptions, and orders. You are responsible for knowing some of the more frequently used abbreviations.

Abbreviation	Meaning
A	before
Ac	before meals
Ad	right ear
ad lib	freely, as desired
Am	before noon, morning
Aq	water (eg dilute in water)
As	left ear
Au	both ears
ASA, asa	aspirin
ASAP	as soon as possible
BID, bid	twice a day (in a 24 hour period)
c or w/	with
cap or caps	capsule(s)
cath	catheter
cc (ml)	cubic centimeter
c/o	complains of
D	day or daily
D/C or disc	discontinue
dil	dilute or dissolve
dx	diagnosis
elix	elixir
exp	expiration
F	Fahrenheit
fld	fluid
GI	gastrointestinal
GM or gm or g	gram
GR or gr	grain
GTT or gtts	drops
GU	genitourinary
h	hour
ha	headache
hs	hour of sleep
IM	intramuscular
lb	pound
mg or mgm	milligram
ml (cc)	milliliter

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Abbreviation	Meaning
NPO or npo	nothing by mouth
NR	no refill
oz	ounce
od	right eye
os	left eye
ou	both eyes
otic	pertaining to the ear
oint	ointment
p	after (post)
pc	after meals
per	by
pm	afternoon
po	per os, by mouth
pr	per rectum
PRN or prn	as needed (as circumstances require)
q	every
qd	every day (not a recommended abbreviation)
qh	every hour
q2h	every 2 hours (any # can be used)
qhs	every bedtime
qam/qpm	every morning/every afternoon
qid	four times a day
qod	every other day
Rx1	refill once
s	without
sol	solution
STAT	immediately
sc	subcutaneously
sig	signatura which means directions
SL, subling	sublingual
Supp	suppository
tab	tablet
T/tbsp	tablespoon
tsp	teaspoon
tid	three times a day
TPR	temperature, pulse, respiration
ud	as directed
u (iu)	unit (international unit)
ung or oint	ointment

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Abbreviation	Meaning
wa	while awake
w/o	without
x	times
5cc	one teaspoonful
#	number
i, ii, iii	one, two, three

Liquid Measurements	
Household	Approximate metric
1 teaspoonful	5 ml
1 tablespoonful	15 ml
1 measuring cupful	240 ml
1 pint	480 ml
1 quart	960 ml
1 ounce	30 ml

Chemical Abbreviations	
Abbreviation	Meaning
Fe	Iron
HCl	Hydrochloric Acid
H ₂ O	Water
H ₂ O ₂	Hydrogen peroxide
KCl	Potassium Chloride
KI	Potassium Iodide
MOM	Milk of Magnesia
Na	Sodium
NaCl	Sodium Chloride

F. PROCEDURES AND DOCUMENTATION

Whenever medications are administered, the person administering the medication(s) must accurately document or chart that the medication was taken by the consumer. The Medication Administration Record (MAR) and progress notes are the forms most frequently used for such documentation. Each person's chart or record contains many facts regarding that person. This chart is confidential. All entries should be accurate, factual and done with sincerity, thought, and safety.

The ABC's of charting include:

- A. Accurate
- B. Brief
- C. Completely objective

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

A medical or health record is the collection of all pertinent facts concerning a person's illnesses, treatment, and past medical history. The medical record is an important tool that serves as a basis for planning care, communicating between physicians and other workers, and providing documentation as to the course of illness, treatment, and response to this treatment. They serve as a basis for review, study, and evaluation of the health care given.

The medical record is confidential and should not be shown or discussed with anyone not administering care to the individual. All accounts of the person's condition and care are written and signed by the person giving the care. These accounts should reflect observed facts, not inferences or judgments.

As mentioned above, the Medication Administration Record (MAR) is used to document medications taken by each individual. The MAR includes a column which lists the names of the medications that are prescribed. It should list a start date for each prescribed medication and a stop date when known. It also contains the time and date the medication was taken, and the initials of the person helping to administer the medication. The listed medications are from the physician's orders and the process by which they appear there is known as "transcribing". Transcribing involves copying the physician's orders onto the Medication Administration Record (MAR).

Charting Rules:

Below are listed the general rules which apply to charting.

1. The medication column should be completed by an authorized person. Make sure you are familiar with the medications listed, doses ordered, and abbreviations used.
2. For each medication administered by you, your **initials** must appear below the correct date and opposite the medication administered.
3. Your initials and signature must be in an appropriate space on each MAR.
4. **Ditto marks are never used.**
5. Never erase or use any kind of liquid eraser. If you make an error in recording, draw a single line through the error and initial and date it.
6. **Record immediately** after administering the medication on the MAR. This is the only way to be sure that you are charting the right medication, giving it to the right person, at the right time, by the right route.
7. If a medication cannot be administered as ordered for some reason, put your initials in the appropriate box, circle the initials, and note the reason on back of the MAR. Notify the appropriate person regarding your actions.
8. If the person **refuses** the medication after three attempts within the appropriate time frame, place a circle in the box, write your initials inside this circle, and chart the reason for the refusal in the notes on the back of the MAR. Notify the appropriate person of this refusal.

1. FILLING OUT THE MEDICATION ADMINISTRATION RECORD

Following are examples of prescriptions and the Medication Administration Record (MAR) that would be filled out based on that prescription. Transcription errors are common and can be fatal. You must pay close attention to what the prescription states and how you transcribe it onto the MAR. If you are unsure of the directions or anything else on a prescription, ask the primary care physician to clarify.

Example # 1

You have taken Joe Smith to see Dr. Davis because of his runny nose and cough. Dr. Davis prescribed the following medications. You picked up the prescriptions at 2 pm on January 3rd. You now must fill out the MAR and give the first dose of medication.

Other information you will need: Joe has allergies to Penicillin and oranges. Joe's birth date is November 16, 1958

Davis and Hartman Medical Group, PLLC
1011 Jackson Helena, MT 59604
406-442-6779

Name: Joe Smith

Date: January 3, 2009

Rx:

Allegra 60 mg #60
Sig: one tab po bid for allergies
Refill x 1 year

Zithromax 250 mg # 6
Sig: give two tabs po today, then one tab po daily for 4 days for bronchitis

Signed: Ron Davis, MD
Ron Davis, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Medication Administration Record

Medication	JAN	HR	1	2	3	4	5	6	7	8	9	10	11	12	
Allegra 60 mg by mouth twice daily	start														
	1/3/09	8am	X	X	X										
		8pm	X	X											
Zithromax 250 mg 2 tabs by mouth today	start														
	1/3/09	3pm	X	X		X	X	X	X	X	X	X	X	X	
Zithromax 250 mg one tab by mouth daily for four days	start														
	1/4/09	8am	X	X	X					X	X	X	X	X	
Diagnosis: allergies, bronchitis															
Allergies: Penicillin, oranges					IN	Name				IN	Name				
Name: Joe Smith		Physician: Dr Ron Davis			NR	Nan Roberts				TJ	Tim Jones				
Date of Birth: 11/16/58					Phone number: 442-6779			cp	Caroline Peters						

There are a number of different forms available and the form above is only part of what a whole month would look like as it only contains the first 12 days. Each provider will have a specific form that is used for their consumers. You will be shown how to fill out that particular form at your job. The form presented here is being used to teach you the *basics* of filling out a MAR. This form and the example in the appendix are the forms that will be used for your test.

As you can see, this form contains columns for the medications, month/start dates, HR (hour), and then each day of the month across the top. Below each day, there are spaces for the initials of the person that assisted with medication administration on that day. In this case, Allegra is to be given at 8 pm on 1/3 and then twice daily (8 am, 8 pm) thereafter. Zithromax is to be given as two tablets on 1/3 only so all the days after that are crossed off.

There are different ways to fill out the spaces under the dates of the month when a medication is not to be given. Usually a line with an arrow that extends from the first of the month to the start date is used. Another line is used for the days following the last prescribed dose of a medication and extends to the last day of the month. Any day of the month on which that medication is not given should have an **X** or a line through it. In this manual, **X**'s have been used for

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

ease in typing. Some agencies use a different color for am (morning shift) or pm (afternoon shift) medication times. Some forms do not list diagnoses but if present, this gives you and anyone helping with medications, more information regarding that person. All forms must have a spot for your signature and initials (IN).

Another possible way to fill out the MAR for this particular prescription would be to place a number below the spot where a medication would be initialed when the medication is prescribed for a short period of time such as 4 days.

Zithromax 250 mg one tab by mouth daily for four days	start													
	1/4/09	8am	X	X	X					X	X	X	X	X
						1	2	3	4					

Example # 2:

You just took Brian to see Dr. Davis for follow up. Brian's protime (a blood test which monitors the amount of Coumadin® that Brian requires) came back and an adjustment is being made to his current dose which is 3 mg daily. To fill out the MAR you will need to know that February 4th is a Wednesday. You will also need to know that M, W, F stands for Monday, Wednesday, Friday and S,S,T,Th stands for Saturday, Sunday, Tuesday, Thursday.

Brian has allergies to shellfish and Penicillin and his birthday is January 3, 1940.

<p>Davis and Hartman Medical Group, PLLC 1011 Jackson Helena, MT 59604 406-442-6779</p>	
<p>Name: <u>Brian Hunter</u></p>	<p>Date: <u>February, 4, 2009</u></p>
<p>Rx: <i>Coumadin 1 mg</i> <i># one month supply</i> <i>Sig: give two tablets po every M,W,F and three tablets po every S,S,T,Th for atrial fibrillation starting February 6th.</i></p>	
<p>Signed: <u>Ron Davis, MD</u> Ron Davis, MD</p>	

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Coumadin 1 mg 3 tabs by mouth daily	start													
	8/4/07	2:00 pm	NR	NR	NR			X	X	X	X	X	X	X
Coumadin 1 mg 2 tabs by mouth on Mon, Wed, and Fridays	start	2:00 pm	X	X	X	X	X		X	X		X		X
	2/6/09													
Coumadin 1 mg 3 tabs by mouth on Tues, Thurs, Sat, and Sunday	start	2:00 pm	X	X	X	X	X	X			X		X	
	2/7/09													
Diagnosis: atrial fibrillation														
Allergies: shellfish, penicillin						IN	Name			IN	Name			
Name: Brian Hunter		Physician: Dr Ron Davis				NR	Nan Roberts			TJ	Tim Jones			
Date of Birth: 1/3/40		Phone number: 442-6779				cp	Caroline Peters							

A different dose of the medication is given depending upon the day of the week therefore you use a separate line for each of the two doses. One line for the 2 tablet dose given on M, W, F and another line for the 3 tablet dose given on T, TH, S, S. On the days that a particular dose is not given, such as M, W, F when the 3 tab dose is **not** given, an **x** (or line) is put through those corresponding dates on that line (Feb 6, 9, and 11). **X**'s have also been placed on the days prior to the starting date of the change in dose.

The first row shows the old dosing schedule which started in 2007: 3 tablets daily. This dose continues until 2/6 when the prescription indicates that a new dose starts. Therefore the rest of the month in that row is crossed out after the 2/5 dose.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

It would also be acceptable to write in the days of the week beneath the dates to more easily indicate M, W, F etc. as is shown below.

Some group homes may also use MARs which have stop dates, not just start dates. The stop date is the date that the last dose of a given medication was given. These can be placed as follows:

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Coumadin	start		S	M	T	W	Th	F	S	S	M	T	W	Th
1 mg 3 tabs by mouth daily	8/4/07	2:00 pm	NR	NR	NR			X	X	X	X	X	X	X
	stop													
	2/5/09													

Example # 3

Mary Hunter has epilepsy. She is on Tegretol® but her seizures are not well controlled. Her physician is now adding Depakote® to her medications. Her current MAR contains all of the usual information except the new medication. When you get back to the group home at 3pm, you must add the new medication to her MAR.

Davis and Hartman Medical Group, PLLC 1011 Jackson Helena, MT 59604 406-44-6779	
Name: <u>Mary Hunter</u>	Date: <u>February 2, 2009</u>
Rx: <i>Depakote 250 mg</i> <i># 98</i> <i>Sig: one capsule po BID for one week, starting tonight, then increase to 2 capsules po BID</i> <i>Refill for a year</i>	
Signed: <u>Jim Hartman, MD</u> Jim Hartman, MD	

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Tegretol 400 mg by mouth three times daily	start	6 am	NR	NR										
	6/5/07	2 pm	cp	cp										
		8 pm	cp											
Depakote 250 mg one capsule by mouth twice daily for 1 week, then	start	8 am	X	X							X	X	X	X
	2/2/09													
		8 pm	X								X	X	X	X
Depakote 250 mg, 2 capsules by mouth twice daily	start	8 am	X	X	X	X	X	X	X	X				
	2/9/09													
		8 pm	X	X	X	X	X	X	X	X				
Diagnosis: seizure disorder (epilepsy)														
Allergies: None					IN	Name			IN	Name				
Name: Mary Hunter		Physician: Dr Jim Hartman			NR	Nan Roberts			TJ	Tim Jones				
Date of Birth: 6/3/62		Phone number: 442-6779			cp	Caroline Peters								

As you can see, the Tegretol® has been in use for many months, so there will be initials indicating it was given at the proper times thus far in February. The new medication, Depakote®, is going to be given at two different doses: one capsule BID (twice daily) for a week, then 2 capsules BID. The medication is thus written as two different entries: one for each dose. The first dose starting immediately and stopping after a week, and the second dose starting after one week.

Another confusing part of prescriptions is determining how many doses the physician wants given if the prescription states give for one week? In this case does that mean **14 doses** (7days x 2 doses/day), or does it mean 13 doses (one dose the first day, then two daily for the next six days for a total of **7 days**). The following examples show these differences: the first shows how it would look if

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

the MAR was written to reflect 7 days, not 14 doses. In the second example, the MAR reflects 14 doses of the drug. Neither way is entirely wrong but if there is any confusion, you must clarify it with the physician. In the case of antibiotics especially, you would give the medication until it is gone so look at the number of pills that are on the prescription and that will help you figure out the exact number of doses to allow when you make up the MAR.

1.

Depakote 250 mg one capsule by mouth twice daily for 1 week, then	start	8 am	X	X							X	X	X	X
	2/2/09													
		8 pm	X								X	X	X	X
				1	2	3	4	5	6	7				

2.

Depakote 250 mg one capsule by mouth twice daily for 1 week, then	start	8 am	X	X								X	X	X
	2/2/09													
		8 pm	X								X	X	X	X
				1	2	3	4	5	6	7	8			

Medication times:

Another thing you will learn at your job is the times that meds are given. You know that QID means 4 times a day while the person is awake but not necessarily every 6 hours. So what exact hour is the med to be given? This can vary depending on such things as the schedule of the individual, activities at a group home, and even staffing.

- QID (four times a day): often given at 7-11-3-8 or 8-12-4-8
- TID (three times a day): often given at 7am-2pm-8pm
- BID (twice daily): often 7am – 7pm or 8am – 8pm

If a prescription states the medication is to be given every 6 hours, then the medication is given every six hours around the clock regardless of when the client sleeps. Generally this is 6-12-6-12 but this can vary depending on your provider's policy and the consumer's schedule. For these exercises and the test, use times that make sense and as long as doses are spaced out in a reasonable manner, you won't be wrong.

Also remember that if you have a prescription from a doctor, but are not sure about what times the client should take the meds or don't understand anything else about that prescription, be sure to call and get clarification. You will never be wrong in asking - the safety of the client comes first.

These are some basic examples. Try to fill in the practice MARs at the end of this section. You will be given a sample prescription and be asked to fill out a MAR on your test. You will also be given a MAR that has been filled out, and using the sample prescription and other information provided, you will need to determine errors that are present. **Along with listing the “seven rights” of medication administration, it is mandatory that you correctly fill out a MAR and are able to find errors on a sample MAR in order to pass the test.**

G. ERRORS IN MEDICATION ADMINISTRATION

Despite our best efforts, mistakes do happen and medication administration is no exception. One of the most frequent errors is forgetting to administer a scheduled medication. The most important thing is to deal with it appropriately. If any medication is missed, it needs to be documented. As a general rule, if less than half the time before the medication is due to be given again has passed, give the medication and continue with the next dosage on schedule. If more than half the dosage interval has passed, skip the missed dose and continue the next dose as scheduled. If there is any question, call the primary care physician, pharmacist or nurse for advice.

If a medications error occurs it is because one of the “Seven Rights” of medication administration was not observed, which are:

1. Right person
2. Right time
3. Right dose
4. Right medicine
5. Right method (route) of administration
6. Right position
7. Right texture/consistency

What to do when an error occurs:

When an error occurs, don't panic. Most of the time if an error occurs only once, it is not an overwhelming threat to that person. There are, however, a few medications and circumstances in which such errors can result in serious effects. When a medication error occurs, you should keep the person under observation to monitor for ill effects. According to the protocol of the provider for which you work, call the pharmacist, primary care physician or nurse immediately and explain the circumstances. They will instruct you as to what to do next, if anything, and what symptoms could occur. The error must also be documented according to the protocol of the provider agency. You should record in the person's chart, exactly when the error happened, what was done, and if and how

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

the person was affected. There should be follow-up charting to reflect any long term effects.

An incident form will need to be completed each time a medication error occurs. The purpose of this is not to assign blame but rather is a means to identify problems with medication administration procedures. Once problems are identified, procedures can be changed to prevent future problems. Each agency has their own forms for reporting errors or "incidents" which you will learn. Therefore examples of error or incident forms will not be given here.

MAR error example:

The following is an example of a MAR which contains mistakes. You will be given examples such as this on your test and will need to find the errors. You will always be given a brief paragraph describing what has occurred when the client visited the doctor. This paragraph contains important information so be sure to read it carefully. Make a copy of the prescription and the MAR so that you can easily write on them as you look for discrepancies. As you can see, one error in transcribing the information on the MAR leads to many mistakes during the following days until the mistake is discovered. Every missed dose of a medication is an error.

Example: Mary Hunter has epilepsy. Her birthday is 6/3/62 and she is allergic to sulfa. She is taking Tegretol 400 mg tid and Depakote was recently added. You are supposed to help administer meds to Mary on the morning of **February 11th**. As you look over the MAR, you notice some problems. Here is the prescription and the MAR that was filled out. There are at least 5 errors in the MAR, some with multiple parts to the one error. Number them on the MAR worksheets (copy the following two pages to use as worksheets, do not write in the manual) and then list them. These must be different errors, not the same error that was made on consecutive days.

Davis and Hartman Medical Group, PLLC
1011 Jackson Helena, MT 59604
406-442-6779

Name: Mary Hunter

Date: February 2, 2009

Rx:

Depakote 250 mg # 98
Sig: one capsule BID for one week starting tonight,
then increase to 2 capsules BID
Refill for a year

Signed: Jim Hartman, MD
Jim Hartman, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Tegretol 400 mg by mouth three times daily	start	6am	NR	NR	NR	NR	NR		TJ	TJ	TJ	TJ		
	6/5/07	2pm	NR	NR	NR	NR	NR	TJ	TJ	TJ	TJ	TJ		
		8pm	cp	cp	cp	VL	VL	VL	VL	VL	cp	cp		
Depakote 250 mg one capsule per mouth daily for one week then	start	8am	X	X	NR	NR	TJ	TJ	TJ	TJ	TJ	TJ		
Depakote 250 mg two capsules by mouth twice daily	start	8am	X	X	X	X	X	X	X	X	X			
		8pm	X	X	X	X	X	X	X	X		cp		
Diagnosis:														
Allergies: sulfa					IN	Name			IN	Name				
Name: Mary Hunter		Physician: Jim Hartman			NR	Nan Roberts			TJ	Tim Jones				
Date of Birth: 6/3/62		Phone number: 442-6779			cp	Caroline Peters			VL	Vicki Lund				

1. _____
2. _____
3. _____
4. _____
5. _____

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Administration of Medications -

Medication Administration Record

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Tegretol 400 mg by mouth three times daily	start	6am	NR	NR	NR	NR	NR	1	TJ	TJ	TJ	TJ		
	6/5/07	2pm	NR	NR	NR	NR	NR	TJ	TJ	TJ	TJ	TJ		
		8pm	cp	cp	cp	VL	VL	VL	VL	VL	cp	cp		
Depakote 250 mg one capsule by mouth daily 2 for one week then	start	8am	X	X	NR	NR	TJ	TJ	TJ	TJ	TJ	4		
	3													
				2	2	2	2	2	2	2	2	4		
Depakote 250 mg two capsules by mouth twice daily	start	8am	X	X	X	X	X	X	X	X	X	4		
	3													
		8pm	X	X	X	X	X	X	X	X	4	cp		
Diagnosis: 5														
Allergies: sulfa					IN	Name			IN	Name				
Name: Mary Hunter			Physician: Jim Hartman		NR	Nan Roberts			TJ	Tim Jones				
Date of Birth: 6/3/62			Phone # 442-6779		cp	Caroline Peters			VL	Vicki Lund				

Answers:

1. Tegretol not recorded (initialed) as having been given on Feb 6
2. a. Transcription error: script lists bid, MAR states daily which led to:
 - b. no evening meds given for 9 doses
 - c. Script states that Depakote was to start “tonight”, 2/2, but wasn’t given
3. No start dates
4. a. Dose was to be changed after one week – 2/9 should have been the start of the higher dose
 - b. Lower dose also given on 2/10 am when it should have been the higher dose
5. No diagnosis

As you can see, a single transcription error leads to numerous errors in administering meds correctly. Each time a new prescription is written; all parts of the order must be looked at and transcribed correctly including start dates. Other pieces of information need to be correct on the MAR including the consumer’s name, diagnosis, allergies, birth date, etc.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Administration of Medications

The correct way to fill out this MAR:

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Tegretol 400 mg by mouth three times daily	start	6am	NR	NR	NR	NR	NR	TJ	T J	T J	T J	TJ		
	6/5/07	2pm	NR	NR	NR	NR	NR	TJ	T J	T J	T J	TJ		
		8pm	cp	cp	cp	VL	VL	VL	V L	V L	c p	cp		
Depakote 250 mg one capsule per mouth twice daily for one week then	start	8am	X	X	NR	NR	TJ	TJ	T J	T J	X	X	X	X
	2/2/09 pm													
		8pm	X	cp	cp	VL	VL	VL	V L	V L	X	X	X	X
Depakote 250 mg two capsules by mouth twice daily	start	8am	X	X	X	X	X	X	X	X	T J	TJ		
	2/9/09													
		8pm	X	X	X	X	X	X	X	X	c p	cp		
Diagnosis: epilepsy														
Allergies: sulfa					IN	Name			IN	Name				
Name: Mary Hunter		Physician: Jim Hartman			NR	Nan Roberts			TJ	Tim Jones				
Date of Birth: 6/3/62		Phone number: 442-6779			cp	Caroline Peters			VL	Vicki Lund				

Self-study Questions Section IV. Administration of Medications

1. Medication administration includes:
 - a. recording all medications in the person's record
 - b. sometimes having to crush tablets for ease in swallowing
 - c. washing hands
 - d. checking the prescription label
 - e. all of the above
2. Over-the-counter medications:
 - a. may be administered by anyone at any time
 - b. does not require documentation
 - c. requires a prescription
 - d. are safe for all persons
3. A drug order:
 - a. may be written by a prescribing physician
 - b. may be faxed to the pharmacy from the physician's office
 - c. may be taken over the phone by a licensed nurse
 - d. must be written by the physician if given to an unlicensed person
 - e. all of the above
4. An error must be reported immediately if it occurs when:
 - a. setting up medication
 - b. passing medication
 - c. recording medication
 - d. all of the above
 - e. a and b only
5. The original pharmacy label must contain at least the following information:
 - a. person's name
 - b. strength of the medication
 - c. flavorings used
 - d. phone number of local hospital
 - e. all of the above
 - f. a and b
6. Reasons to stay with a person until the medication has been taken include:
 - a. some people may tuck the medication in their cheek
 - b. some people may hide the medication or spit it out
 - c. you cannot document that medication was taken unless you witness it
 - d. all of the above
7. To administer medications safely:
 - a. create a calm environment
 - b. practice universal precautions
 - c. know the correct route
 - d. know the possible side effects of the drug
 - e. all of the above
 - f. c and d only

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Self-study Questions Section IV -

8. To prevent injuries from needles or other sharp instruments, you should:
- be very careful when recapping needles
 - not bend, break, or manipulate the needles by hand
 - place all sharp objects into the designated puncture-resistant container
 - all of the above
 - b and c
9. Gloves are often used to prevent or reduce the incidence of exposure to body fluids. Indicate which of the below are true concerning the use of gloves.
- unnecessary to use when assisting clients with bathing
 - should be worn when handling laundry that is soiled with blood
 - unnecessary to use when cleaning up vomit
 - unnecessary to wear when helping with shaving
 - should be worn when changing a bandage
 - a, b, c
 - b and e
 - a, b, d, e
10. Another way to indicate "twice a day":
- bid
 - tid
 - qid
 - all of the above
11. This abbreviation means "before meals":
- am
 - ac
 - hs
 - pc
12. To indicate the medication is to be taken "at bedtime" use:
- bt
 - h
 - hs
 - phs

Questions 13 through 21: Matching, Abbreviations:

- | | |
|-----------------------------|-----------|
| 13. ____ water | a. ad lib |
| 14. ____ complains of | b. wa |
| 15. ____ both eyes | c. H2O |
| 16. ____ freely, as desired | d. q 2h |
| 17. ____ times | e. dx |
| 18. ____ every two hours | f. c/o |
| 19. ____ Roman Numeral X | g. ou |
| 20. ____ while awake | h. x |
| 21. ____ diagnosis | i. 10 |

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Self-study Questions Section IV -

Questions 22 through 29: Matching, Abbreviations.

- | | |
|------------------------------|---------|
| 22. _____discontinue | a. GU |
| 23. _____as soon as possible | b. ha |
| 24. _____gastrointestinal | c. hs |
| 25. _____twice a day | d. GI |
| 26. _____genitourinary | e. GTT |
| 27. _____headache | f. d/c |
| 28. _____drops | g. BID |
| 29. _____hour of sleep | h. ASAP |

Questions 30 though 35: Matching, Abbreviations:

- | | |
|---------------------------------|---------|
| 30. _____ pertaining to the ear | a. TID |
| 31. _____ as needed | b. pc |
| 32. _____ every other day | c. otic |
| 33. _____ three times a day | d. prn |
| 34. _____ after meals | e. ac |
| 35. _____ before meals | f. QOD |

Questions 36 through 41 Matching:

- | | |
|--|--------------------------|
| 36. ___ Medications given under the tongue with instructions to keep it under the tongue until dissolved | a. MAR |
| 37. ___ Washing hands and putting on gloves. | b. accurate |
| 38. ___ Document used to indicate an individual's medications. | c. seven |
| 39. ___ Number of times a medication label is to be checked | d. sublingual |
| 40. ___ One of the ABC's of charting. | e. three |
| 41. ___ A medication error is defined as any violation of this number of "rights". | f. universal precautions |

42. T F Do not chart for another employee.
43. T F On the MAR, ditto marks may be used to save time.
44. T F When a medication is ordered "x 10 d" that means the medication is given for the next 10 days.
45. T F Sustained release tablets are ordered to be given "po", this means the medication is taken by mouth.
46. T F It is not important for the person taking the medication to know what the medication is for.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Self-study Questions Section IV -

47. T F It is the responsibility of the person administering medications to be familiar with the condition of the person including allergies, problems with swallowing, etc.
48. T F If a medication label has gotten wet and is no longer readable, it is still ok to use the medication as long as you think you know what medication it is.
49. T F If you found a medication on the counter two hours after you thought a client had taken it, you should give the medication to the client at the time you found it.
50. T F Medications that have been prepared but not given to the person for any reason are to be discarded.
51. T F It is ok to touch pills with your bare hands.
52. T F It is ok to mix liquid medications together before administering.
53. T F Medication orders must be in writing on the MAR stating the person's name, drug, dose, etc
54. T F It is ok to chart medications that are given by coworkers.
55. T F Gloves don't have to be changed between helping different clients.
- 56: There are "seven rights" that you must know when administering medications. List those seven rights: (this is **mandatory**; you must be able to list all 7 in any order to pass the test)
1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____

Practice MAR question: # 1

Joey has a bad cough so was taken to Urgent Care as it is late in the afternoon. Joey was born 7/12/86 and is allergic to sulfa. The physician prescribed Amoxicillin for his respiratory tract infection. He was also prescribed cough medication. You return to the group home at 7 pm.

You will need to fill in all the information on the MAR, including name, birth date, etc. Be sure to write in your name and initials (IN) in the correct place. (Write out all abbreviations)

**IMG Walk In Clinic
25 West 6th Street
Helena, MT 59601
406-442-4321**

Name: Joey King **Date:** February 5, 2009

Rx:

Amoxil 250 mg

Disp: # 32

Sig: two capsules po ASAP, then one capsule po TID for 10 days.

Robitussin AC cough medicine 10 mg/5ml

Disp: 120 ml

Sig: 20 mg po qid prn cough for one week

Signed: *Jill Parker, MD*

Jill Parker, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR question: # 1

Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12	13
	start														
	start														
	start														
	start	date													
		time													
		initial													
		date													
		time													
		initial													
		date													
		time													
		initial													
		date													
		time													
		initial													
Diagnosis:															
Allergies:						IN	Name			IN	Name				
Name:		Physician:				NR	Nan Roberts			TJ	Tim Jones				
Date of Birth:		Phone number:				cp	Caroline Peters								

The MAR does not contain enough columns for the number of days that the medication was prescribed. Fill out what you can in the room provided.

Practice MAR question: # 2

Bill Jones has Parkinson's disease and epilepsy. He just saw his physician and his dose of Sinemet has been changed. An antibiotic was also prescribed for a urinary tract infection. Bill is allergic to sulfa. You were given the following prescription and now must transcribe it to the MAR.

You return to the Group Home at 2 pm and will need to fill in all the information on the MAR, including name, birth date, etc. Be sure to write in your name and initials (In) in the correct place. (Write out all abbreviations)

**Internal Medicine Associates
25 West 6th Street
Helena, MT 59601
406-442-4321**

Name: Bill Jones

Date: April 2, 2009

Date of Birth: 12/2/48

Rx:

Sinemet CR 25/100mg

1 month supply

Sig: take one p.o. four times daily

Refill x 1 year

Cipro 250 mg

10

Sig: one p.o. twice daily for five days

Signed: Paul Smith
Paul Smith, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR question: # 2

Medication administration record (MAR)

Medication	April	HR	1	2	3	4	5	6	7	8	9	10	11	12
	start													
	start													
	start													
	start													
Diagnosis:														
Allergies:						IN	Name		IN	Name				
Name:	Physician:					NR	Nan Roberts		TJ	Tim Jones				
Date of Birth:	Phone number:					cp	Caroline Peters							

Practice MAR question: # 3

April 6, 2009: Fran Simmons has atrial fibrillation and is taking Coumadin® (Warfarin) 1 mg, 2 tabs daily. This drug at that dose was started on December 2, 2008. Her dose is being changed so that now she will be taking 1 mg for one day, then 2 mg daily for two days, and the sequence repeats itself. She takes this medication at 2 pm. Here is the prescription you were given.

Fill in the first part of the month as if Troy Yates helped her with her meds on the 1st through 3rd and then Rob Jones helped with her meds through today. Then make the changes necessary. (Write out all abbreviations)

**Internal Medicine Associates
25 West 6th Street
Helena, MT 59601
406-442-4321**

Name: *Fran Simmons*

Date: *April 6, 2009*

Date of Birth: *6/4/64*

Rx:

Coumadin 1 mg

1 month supply

*Sig: take 1 tab po x 1 day starting tomorrow, then 2 tabs po x 2d,
then repeat sequence.*

Refill x 1 year

Signed: *Paul Smith*
Paul Smith, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR question: # 3

Medication administration record (MAR)

Medication	April	HR	1	2	3	4	5	6	7	8	9	10	11	12
	start													
	start													
	start													
Diagnosis:														
Allergies:			IN	Name		IN	Name							
Name:	Physician:		RJ	Rob Jones		TY	Troy Yates							
Date of Birth:	Phone number:		cp	Caroline Peters										

Practice MAR question: # 4

Fran Simmons needs another adjustment in her Coumadin® as her protime is too high. She has atrial fibrillation and is currently taking Coumadin® 1 mg, 1 tab x 1 day, then 2 tabs x 2d, and repeat sequence. Her new prescription is as follows. Make out a new MAR using the prescription below starting June 1st. (Write out all abbreviations)

Internal Medicine Associates
25 West 6th Street Helena, MT 59601
406-442-4321

Name: *Fran Simmons* Date: *May 31, 2009*
Date of Birth: *6/4/64*

Rx:
Coumadin 1mg # 1 month supply
Sig: take 2 tabs po everyday except take 1 tab po every fourth day and repeat sequence. Start the 1 tab dose on June 1st.
Refill x 1 year

Signed: *Paul Smith*
Paul Smith, MD

Medication administration record (MAR)

Medication	June	HR	1	2	3	4	5	6	7	8	9	10	11	12
	start													
	start													
Diagnosis:														
Allergies:					IN	Name		IN	Name					
Name:	Physician:				RJ	Rob Jones		TY	Troy Yates					
Date of Birth:	Phone number:				cp	Caroline Peters								

Practice MAR question: # 5

Carol Frasier was seen by her physician today for a regular check-up but has also been having some problems with breathing. She has recently been diagnosed with pulmonary hypertension and was started on some new medications at this visit. She has been getting Lasix 40 mg, 2 tabs, at 8 am every morning since 1/2/09. Her dose will now be Lasix 40 mg, 2 tabs every morning, 1 tab every afternoon. Troy Yates has been working and has helped her with this medication every day so far this month.

She also requires antibiotics prior to procedures due to a prosthetic heart valve and is going to have a procedure later this month. It is scheduled for 2 pm on February 10th. Here is the prescription that the physician gave you. By the time you get back to the Group Home with the new prescriptions it is 7:30 pm. Carol is allergic to shellfish and Penicillin.

Internal Medicine Associates
25 West 6th Street Helena, MT 59601
406-442-4321

Name: Carol Frasier

Date: February 3, 2009

Date of Birth: 9/11/49

RX:

Coreg 3.125 mg # 1 month supply

Sig: one po twice daily for a week starting tomorrow morning, then two po twice daily Refill for one year

Lasix 40 mg # 1 month supply

Sig: 2 tabs po q am, 1 tab po q 2 pm Refill for one year

Clindamycin 300 mg # 2

Sig: two tabs one hour prior to procedure on Feb 10th.

Combivent inhaler Disp: one inhaler

Sig: two puffs four times daily Refill for 1 year

Signed: Carla Herman

Carla Herman, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR question: # 5 Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12		
	start															
	start															
	start															
	start															
	start															
Diagnosis:																
Allergies:			IN	Name						IN	Name					
Name:	Physician:									TY	Troy Yates					
Date of Birth:	Phone number:															

Practice MAR error question: # 1

Brian was seen by Dr. Hartman on the afternoon of 2/5/09. His Coumadin was increased from 2.5 mg daily to 3 mg daily. He was also started on Digoxin. Brian has atrial fibrillation. He is allergic to Penicillin. You come into work on the morning of 2/8/09 and prepare to help administer meds. You have some concerns about what it shows on the MAR.

There are 7+ errors in the MAR: number them on the MAR (after first making a working copy of these two pages) and list them:

Davis and Hartman Medical Group, PLLC
1011 Jackson
Helena, MT 59604
406-442-6779

Name: Brian Hunt **Date:** February 5, 2009
DOB: 6/7/45

Rx:

Digoxin 0.5 mg

30

Sig: one tab p.o. q.d. Refill x 1 year

Coumadin 3 mg

30

Sig: one tablet p.o. q.d. starting 2/7 Refill x 1 year

Signed: Jim Hartman, MD
Jim Hartman, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR error question: # 1

Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Coumadin 2.5 mg per mouth every day	start													
	6/5/07	2pm	NR	NR	NR	NR	cp	X	X	X	X	X	X	
Coumadin 3 mg per mouth every day	start													
	2/5/09	2pm	X	X	X	X	X	cp	cp					
Digoxin 0.05 mg po qid	start	7am	X	X	X	X	X	cp	cp					
	2/5/09	11am	X	X	X	X	X	cp	cp					
		3pm	X	X	X	X	X	cp	cp					
		8pm	X	X	X	X	cp	cp	cp					
Diagnosis: atrial fibrillation														
Allergies: sulfa					IN	Name		IN	Name					
Name: Brian Hunter		Physician: Jim Hartman			NR	Nan Roberts		TJ	Tim Jones					
Date of Birth: 6/3/55		Phone number: 442-6779			cp	Caroline Peters		VL	Vicki Lund					

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. What would you do after discovering these errors?

Practice MAR error question: # 2

Mike has a sore on his leg that has become infected. He was seen by Dr. Hartman on the afternoon of March 3 and medications were prescribed. Mike is allergic to sulfa. You are supposed to help administer meds to Mike on the morning of March 6th. As you look over the MAR, you notice some problems.

Here is the prescription and the MAR that was filled out.

There are at least 5 or more errors in the MAR (some errors have different aspects): number them on the MAR (after first making a working copy of these two pages) and list them:

Davis and Hartman Medical Group, PLLC
1011 Jackson
Helena, MT 59604
406-442-6779

Name: Mike Peters Date: March 3, 2009

Date of birth: 4/6/73

Rx:

Keflex 250 mg

23

Sig: two caps po immediately, then one cap po tid until gone

Bactroban ointment

Disp: one medium tube

Sig: apply to wound bid x 7 days

Signed: Jim Hartman, MD
Jim Hartman, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR error question: # 2

Medication administration record (MAR)

Medication	Mar	HR	1	2	3	4	5	6	7	8	9	10	11	12	13	
Keflex 250 mg 2 capsules tid until gone	start	7 am	X	X	X	cp	cp			X	X	X	X	X	X	
	3/4/09	2 pm	X	X	X	VL	VL			X	X	X	X	X	X	
		8 pm	X	X	X		VL			X	X	X	X	X	X	
Bactroban ointment apply to wound twice daily for 7 days	start	8 am	X	X	X	cp	cp						X	X	X	
	3/4/09															
		8 pm	X	X	X	VL	VL						X	X	X	
	start															
Diagnosis:																
Allergies: sulfa							IN	Name			IN	Name				
Name: Mike Peters			Physician: Jim Hartman				NR	Nan Roberts			TJ	Tim Jones				
Date of Birth: 4/6/73			Phone number: 442-6779				cp	Caroline Peters			VL	Vicki Lund				

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Practice MAR error question: # 3

Mary Hunter has epilepsy, anxiety, and severe constipation. She has no allergies. She just had an appointment with Dr. Hartman and was prescribed a new medication for constipation. She was also scheduled for dental work on March 5 and requires Ativan prior to the appointment to help her relax. You came in to work on March 4th and are about to help with medication administration. You notice that some things are not quite right on the MAR. Here is the prescription and the MAR that was filled out.

There are at least 7+ errors in the MAR (some errors have different aspects): number them on the MAR (after first making a working copy of these two pages) and list them:

Davis and Hartman Medical Group, PLLC
1011 Jackson Helena, MT 59604
406-442-6779

Name: Mary Hunter **Date:** March 2, 2009

Date of birth: 3/7/65

Rx:

Ativan 1 mg

2

Sig: give two tablets po on the morning of March 5, 2009

Lactulose syrup 10 g/15 ml

Disp: One month supply

Sig: give 20 g po every morning starting 3/3/09.

Refill x 1 year

Signed: Jim Hartman, MD
Jim Hartman, MD

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Practice MAR and MAR Error Questions

Practice MAR error question: # 3

Medication administration record (MAR)

Medication	March	HR	1	2	3	4	5	6	7	8	9	10
Ativan 1 mg give 1 tab by mouth starting 3/3/09	start											
	3/3/09	8am	X	X	pp							
Lactulose syrup 10g/15ml Give 15 ml by mouth every morning starting 3/3/09	start	8am	X	X	pp							
	3/3/09											
Diagnosis:												
Allergies: sulfa					IN	Name		IN	Name			
Name: Mary Hunter		Physician: Jim Hartman			PP	Polly Primm		RT	Rick Thomas			
Date of Birth: 3/3/65		Phone number: 442-6779			hh	Holly Hunt		LD	Larry Devine			

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

V. THE ROLE OF THE TRAINER

A. Normalization, Rules, and Laws

This manual is intended to provide care givers with information about medications, procedures, and other health related issues. The goal of all staff providing direct services is to promote health, safety, and personal growth of persons with developmental disabilities. Reducing errors with medications is an important goal, but staff should also have a basic understanding of the applicable State of Montana rules and laws which impact the use of medications.

The concept of normalization is worth reviewing as services to persons with developmental disabilities continue to evolve. Normalization refers to a system of values that ultimately supports the right of persons with developmental disabilities to live, work, and pursue dreams and desires in the same ways as persons who are considered non-disabled. Our sense of self worth and dignity is closely tied to how we are perceived and treated by others. The lifelong acquisition of skills and knowledge which result in greater freedom and independence is important for everyone. Teaching persons to become more independent in taking their own medications is more than just a good idea; however, it is the law.

In 1977, the Montana State Legislature passed an amendment allowing non medical professionals to assist and supervise in the self-administration of medications by persons with developmental disabilities.

53-20-204. MCA. (1) The department may adopt rules necessary for the proper administration of this part.

(2) The department shall adopt rules in cooperation with the board of nursing under which a properly trained staff member of a facility providing services to persons with developmental disabilities under this part may assist and supervise a client of the facility in taking medication if the medication is usually self-administered and if a physician has prescribed the assistance. (MCA 53-20-204, eff 1977)

The Administrative Rules of Montana (ARM) 37.34.114 CERTIFICATION OF PERSONS ASSISTING IN THE ADMINISTRATION OF MEDICATION

summarizes the responsibilities of Developmental Disabilities Program staff and provider staff in maintaining the agreement between the Developmental Disabilities Program and the Board of Nursing, enabling non-medical staff to assist in administration of medications. Key elements include:

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
The Role of the Trainer -

1. This rule establishes criteria and procedures by which non-medical professionals may assist and supervise an individual in taking medications. This assistance and supervision may only be given where a medication which is normally self-administered has been prescribed by a physician and the physician has ordered that assistance or supervision is necessary.
2. The following definitions apply:
 - a. "Assistance" means providing any degree of support or aid to an individual who independently performs at least one component of medication-taking behavior; and
 - b. "Supervision" means critically observing and directing an individual engaged in medication-taking behavior.
3. Non-medical professionals working in Developmental Disabilities Program funded services must be med certified (pass the medication exam administered by the program) before they may assist and supervise in the administration of medications. Persons must be recertified (pass the medication exam) once every two years in order to maintain their med certification.
4. For individuals receiving developmental disabilities services for 30 days and requiring supervision and assistance to be administered for more than 10 consecutive days, this activity must be included as an outcome in the written individual plan. There must be a program in place which addresses:
 - a. The target medication-taking behavior;
 - b. the conditions under which such behavior should occur;
 - c. the conditions under which such behavior will be trained;
 - d. the criterion for completion of the individual program plan;
 - e. the written strategies for training the target behavior;
 - f. a data recording system which accounts for each prescribed medication dosage, and
 - g. a daily data recording system which specifies progress or lack of progress toward the target outcome.
5. There are two conditions under which an individual program to teach self-administration of medications is no longer necessary:
 - a. the individual has met the criterion for self-administering medications (an individual is considered capable of self-administering medication when it has been documented that the individual has self-administered (100%) of prescribed medication dosages for a consecutive 30 day period), or
 - b. the Individual Planning Team has reviewed the individual's program and found that the individual has reached the maximum level of independence in the self-administration of medication of which that individual is currently capable.

Medical tasks which may not be delegated to non-medical professionals are outlined in ARM 24.159.1604 and 24.159.1616 (Board of Nursing Rules).

A staff person's responsibilities must be clearly understood. The staff person's role is always to ensure that the daily living needs of individuals are met

in a safe and healthy environment. Assisting people in achieving personal growth can be a demanding yet rewarding challenge for staff.

B. Teaching Self-Medication Skills

Teaching individuals to become more independent in taking medications remains a critical component of the agreement between the Board of Nursing and the Developmental Disabilities Program. The Administrative Rules of Montana require a formal training program be in place for individuals who need assistance and supervision in taking medications. Exceptions to this requirement are outlined in the rule.

Many individuals in Developmental Disabilities Program -funded services may never become fully independent in all aspects of self-medication, but progress in achieving and maintaining increased independence is likely if systematic training approaches are used. There are many training techniques that can be used. It is impossible to list them all here but some basic concepts will be covered. Further information can be obtained through Developmental Disabilities Program -funded service providers. The Developmental Disabilities Client Programming Technician (DDCPT) and the Institute for Applied Behavior Analysis Competency Based Training (CBT) curricula are excellent resources for information on behavior modification techniques and teaching new skills.

Applied Behavior Analysis (ABA) is widely used to teach new skills and behavior. ABA takes complex tasks and breaks them down into their most fundamental parts. This is often referred to as task analysis. Skills are systematically introduced in these small steps or tasks. As one small skill is mastered, the next is introduced. Individuals learn by making simple associations between causes and effects. They are presented with a stimulus (such as an object, prompt or cue) and given an instruction. Rewarding immediately with praise, approval, or encouragement is important as behaviors that are rewarded positively are more likely to occur again.

In 2007 the Developmental Disabilities Program was allocated funding by the Legislature to contract with The College of Direct Support to provide standardized training for Direct Care Staff. All new employees must complete a standardized set of lessons within 6 months. These lessons are referred to as "Tier One". During the subsequent years, employees must complete 20 hours of training each year. A staff person may choose to utilize the Career Track for Credentialing which is a standard set of lessons over 5 years. Completing these allows employees to become credentialed through the National Association of Direct Care Professionals. If the career track is not chosen, the Provider develops a list of modules to be completed by each employee. This list of modules must be submitted to the Central Office each year.

There are some minimum standards outlined in the Administrative Rules of Montana Section 37.34.114 for formal training programs designed to teach self-medication procedures. These requirements include the necessity for staff to

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
The Role of the Trainer -

maintain a medication log and for program data to be collected daily, enabling the program reviewers to determine the trainee's level of progress.

C. Example:

The following is an example of how someone might record data for a target behavior. The target behavior is broken down into small components. The trainer records the prompts, if any, that need to be used in order for the individual to complete each step each day.

The following training strategy is one of many ways to train a skill and to document program progress. The "level of independence" data collection method could serve to alert the program reviewer of troublesome steps which may need to be modified. It is not always necessary to teach medication skills using task analysis and data collection for each step. There are many ways to achieve the same end result.

A good idea for ensuring that skills are maintained is to develop a medication protocol which outlines the expected behaviors for both the teacher and the trainee when it is time for meds. Some staff may want to help the person by doing things for the person that are already known by the individual. It may simply be faster or more convenient, especially if the trainee is slow. Unfortunately, this can result in the loss of skills. New staff may be unsure of what the individual is capable of doing. A brief medication protocol for each person inserted in the med log can help ensure that previously learned skills are maintained.

Training should be fun. A good teaching strategy is enjoyable for the staff person and the individual. The best techniques for teaching will result in the trainee getting a lot of positive staff interaction. If the training session isn't fun for the individual, it is time to change the program. Be creative. Ask for help. The chances are good that someone from within the agency is experienced in developing teaching strategies, task analysis, and data collection methods that will increase the likelihood of success in teaching new skills.

Target behavior: The individual will independently fill and drink a cup of water with the afternoon dosage of a medication when given the pills in a medicine cup.

Trainee_____Target Behavior_____

Trainer_____

STEPS	3/1/09			3/2/09			3/3/09			3/4/09			3/5/09			3/6/09		
Pick up cup	I		4	I		4	I		4	I		4	I		4	I		4
	V	Y	3	V		3	V		3	V		3	V		3	V		3
	G		2	G		2	G		2	G		2	G		2	G		2
	M		1	M		1	M		1	M		1	M		1	M		1
	P		0	P		0	P		0	P		0	P		0	P		0
Turn on cold water	I		4	I		4	I		4	I		4	I		4	I		4
	V		3	V		3	V		3	V		3	V		3	V		3
	G	Y	2	G		2	G		2	G		2	G		2	G		2
	M		1	M		1	M		1	M		1	M		1	M		1
	P		0	P		0	P		0	P		0	P		0	P		0
Fill cup with water	I		4	I		4	I		4	I		4	I		4	I		4
	V	Y	3	V		3	V		3	V		3	V		3	V		3
	G		2	G		2	G		2	G		2	G		2	G		2
	M		1	M		1	M		1	M		1	M		1	M		1
	P		0	P		0	P		0	P		0	P		0	P		0
Turn off water	I	Y	4	I		4	I		4	I		4	I		4	I		4
	V		3	V		3	V		3	V		3	V		3	V		3
	G		2	G		2	G		2	G		2	G		2	G		2
	M		1	M		1	M		1	M		1	M		1	M		1
	P		0	P		0	P		0	P		0	P		0	P		0
Put pill in mouth	I		4	I		4	I		4	I		4	I		4	I		4
	V	Y	3	V		3	V		3	V		3	V		3	V		3
	G		2	G		2	G		2	G		2	G		2	G		2
	M		1	M		1	M		1	M		1	M		1	M		1
	P		0	P		0	P		0	P		0	P		0	P		0
Drink ¼ or more of water and swallow pill	I	Y	4	I		4	I		4	I		4	I		4	I		4
	V		3	V		3	V		3	V		3	V		3	V		3
	G		2	G		2	G		2	G		2	G		2	G		2
	M		1	M		1	M		1	M		1	M		1	M		1
	P		0	P		0	P		0	P		0	P		0	P		0
TOTAL	79%																	

key: I = Independent (no prompt needed)
V = Verbal prompt
G = Gesture prompt (may be used with verbal prompt)
M = Modeling prompt (may be used with verbal or gestural prompts)
P = Physical prompt (may be used with verbal, gestural or modeling prompts)

Trainer will record the most restrictive (lowest point value) prompt used to complete each step.

% Independence score: reflects total points earned (numerator) divided by total points possible (denominator). 19/24 =

VI. CATEGORIES OF MEDICATIONS

A. ANALGESICS

Analgesics are pain relieving medications. They are used for both acute and chronic pain.

1. Nonsteroidal anti-inflammatory drugs (NSAIDs)

NSAIDs work by relieving inflammation as well as pain. They are indicated for mild to moderate pain relief. They are used for injuries such as strains, sprains, headaches and arthritis. There are a large number of different NSAIDs on the market including aspirin and ibuprofen. Refer to Appendix F, Drug Classification Tables, under Pain Medications for a more complete listing of the different types of NSAIDs.

Side effects:

- They interfere with how platelets clump (aggregate). This increases bleeding because normally platelets clump together to plug breaks in blood vessels while the rest of the clotting factors work to repair the vessel.
- They produce gastrointestinal side effects such as indigestion and gastric ulcer formation. Food and antacids may help decrease these symptoms.
- Occasionally chronic use of NSAIDs can cause kidney problems.
- Infrequent side effects include liver toxicity, confusion and inability to concentrate, and allergic reactions

2. Tramadol (Ultram®, Ultram ER®)

Tramadol is a somewhat unique analgesic. It acts at pain receptors and inhibits the reuptake of serotonin and norepinephrine (which is a mechanism by which some antidepressants work).

Side effects:

- Lowers seizure threshold (individuals with a seizure disorder may have more seizures while on this drug)
- Gastric (stomach) upset
- Nausea and vomiting
- Constipation
- Dizziness
- Headache
- Insomnia
- Flushing

3. Acetaminophen (Tylenol®, etc)

These medications are used to treat mild to moderate pain and fever. They do not have anti-inflammatory effects.

Side effects:

- Rash
- Anemia
- Increased uric acid level which may cause gout
- Elevation of blood sugar

Warnings/precautions:

Acetaminophen can cause severe liver damage especially with an acute overdose. Liver damage can also result from chronic daily use. Alcohol ingestion can increase the risk for liver damage. Dosage should be limited to less than 4 grams (4000 mg) daily.

4. Opioids (narcotics)

Opioids work by having an analgesic (pain relieving) effect on at least four groups of receptors throughout the body. One type of receptor, the Mu receptor, is found in large numbers in the brain and spinal cord. They not only induce analgesia (pain relief) but have a number of other effects including bradycardia (low heart rate), sedations, euphoria, physical dependence, and respiratory depression.

Opioids come in a variety of preparations and can be given orally, by intramuscular injection, intravenously (in the vein), transdermally (through the skin), transmucosally (nasal and oral sprays), rectally (suppository) and directly into the spinal canal. Some examples of opioids are listed in the table on the following page.

Side effects include:

- Nausea and vomiting
- Constipation
- Low blood pressure
- Bradycardia (low heart rate)
- Sedation
- Agitation and anxiety
- Anorexia
- Confusion
- Seizures (lowers seizure threshold)
- Pruritis (itchy skin) or rash
- Respiratory depression and bronchospasm
- Weakness

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Categories of Medications -

OPIOIDS (NARCOTICS)

Weak agonists	Formulation	Duration of action
Codeine	oral tabs, IM, SubQ	4 hours
Hydrocodone	Usually in combination with acetaminophen in capsules, tablets, elixirs, etc. Brand names include Lorcet®, Lortab®, Norco®, Vicodin®	4 hours
Propoxyphene HCL, propoxyphene napsylate	oral tablets or capsules Darvon®, Darvocet-N 100	4 hours
Strong agonists		
Fentanyl	transdermal patches (Duragesic®) buccal tabs, transmucosal lozenges	72 hours over 1 hour
Hydromorphone	oral tabs, solutions Dilaudid®	4 to 6 hours
Meperidine	oral tabs, syrup, IM, IV, SubQ Demerol®	3 to 4 hours
Methadone	oral tabs, solution, IM	8 hours
Morphine	oral: IR tabs oral: ER tabs MS Contin® oral: Oramorph SR® oral: Kadian, ER® caps oral: Avinza, ER® caps IM, IV, intrathecal SubQ, rectal suppository	4 to 6 hours 8 hours 8 hours 12 hours 24 hours 1 to 4 hours 3 to 4 hours
Oxycodone	oral: Oxy IR® oral: Oxycontin liquid: Roxicodone®	4 to 6 hours 12 hours 4 to 6 hours
Oxycodone combinations	with acetaminophen: Percocet®, Endocet®, Roxicet® with aspirin: Endodan®, Percodan®	4 to 6 hours 4 to 6 hours
Oxymorphone	Oral: Opana®, IR tablets Oral: Opana ER® IM, SubQ IV	4 to 6 hours 12 hours 4 to 6 hours continuous or <1hr

B. ANTI-INFECTIVE MEDICATIONS

Infections are common. We have all had at least one in the past year: a cold or stomach flu (viral infection), a pimple (bacterial infection), a wart (viral infection) or Athlete's foot (fungal infection). Many infections will resolve or go away without treatment. This means that the body's natural defenses will gear up to fight the infecting organism.

There are two important principles to remember about anti-infective agents. One is that no one drug is effective for all infections. The second is that anti-infective agents simply hold the infection in check and minimize damage until the body's defenses can gear up and kill the organism.

To expand on the first principle, some drugs are effective against certain bacteria but will not work against viruses, fungi, etc. Pneumonia is a common infection often caused by viruses. When this is the case, an antibiotic will be completely ineffective in treatment. However if the pneumonia is caused by a bacteria, then common antibiotics such as penicillin or Azithromycin® will be expected to work.

The second principle is equally important. There is a tendency to begin a course of antibiotics but then to stop taking them a few days later when feeling better. When this is done, the symptoms have decreased because the agent has inhibited that organism, but has not killed it. Because bacteria are present in lower numbers, the person feels better but the infection is still present. Since the antibiotic is now no longer being taken, the organism starts to grow and produce symptoms again. It is under these circumstances that resistant organisms develop, making infections more difficult to treat. If the antibiotic is continued for the entire course as prescribed, there is enough time for the body's defenses to kill the remaining organisms.

1. Forms of bacterial infections:

Bacteria are microscopic, single-celled organisms found in air, water, soil, and food. They live on plants, insects, animals, and even in the human digestive system, upper respiratory tract and skin. There are thousands of kinds of bacteria, but only a few actually cause diseases in humans. Some common infections include:

Respiratory infections:

- Upper respiratory infections includes sinus infections and strep throat
- Otitis media (ear infection)
- Lower respiratory infections: pneumonia and bronchitis.

Skin Infections:

- Boils, cellulitis, impetigo, complications from burns.
- Infections in wounds such as after surgery.

Gastrointestinal infections:

- Infectious diarrhea from salmonella, shigella, E.coli, Campylobacter, and Clostridium difficile
- Helicobacter pylori: common chronic infection which is the major cause of gastritis (infection or inflammation of the stomach) and peptic ulcers.

Genitourinary infections:

- Urinary tract infections
- Pyelonephritis (infection in the kidney)
- Sexually transmitted diseases (STD's): Chlamydia, gonorrhea
- Prostatitis (infection in the prostate gland)
- Bacterial vaginosis

Others:

- Heart (endocarditis)
- Meningitis (infection in the fluid of the spinal cord and surrounding the brain)
- Bone (osteomyelitis, septic arthritis)
- Eye infections
- Blood (septicemia)

2. Classes of antibiotics:

There are a number of classes of antibiotics. Within each class are antibiotics that are similar as to how they act on certain infections or bacteria. If a person is allergic to one antibiotic in a class or at least a subgroup within that class, that person will likely have an allergic reaction to the other antibiotics in that same class or subgroup. So for example, if someone develops an allergic reaction such as a rash to amoxicillin, that person will also have an allergic reaction (rash) to Augmentin because it is in the same subgroup of the Beta-lactam class of antibiotics. For a listing of antibiotics within their classes, refer to Appendix F, Drug Classification Tables, under Infectious Diseases.

3. Fungal infections:

Fungi are neither plants nor animals but are classified separately. They include yeasts and molds. They often reproduce by spreading microscopic spores. These are present in the air and in the soil; therefore most fungal infections begin in the lungs or on the skin. Most do not cause infections and seldom cause serious harm except in people with weakened immune systems.

a. Forms of fungal infections

Oral infections

- Thrush (yeast infection in the mouth)
- Esophagitis (yeast or fungus growing in the esophagus and causing inflammation)

Skin infections:

- Tinea versicolor (yeast)
- Intertrigo (yeast infection in skin folds)
- Ringworm (Tinea Corporis)
- Jock itch (Tinea Cruris)
- Athletes foot (Tinea pedis)
- Vaginal yeast infections (Candida)
- Nail fungus (onychomycosis)

Others:

- Lung infections
- Fungal meningitis

For specific antifungal agents refer to Appendix F, Drug Classification Tables, under Infectious Diseases.

4. Viral Infections

A virus is a small organism, much smaller than a fungus or bacterium that must invade a living cell in order to grow. Viruses usually infect one particular type of cell. For example, cold viruses infect only cells of the upper respiratory tract. Viruses are spread by various ways including being swallowed, inhaled, sexually transmitted, and by bites of insects.

a. Types of viral infections:

- Upper respiratory infections including the common cold, sore throats, and influenza.
- Brain and spinal cord: West Nile, rabies, viral encephalitis
- Skins: warts, herpes viruses (fever blisters, shingles, genital herpes)
- Mononucleosis (Epstein-Barr virus)

For specific antiviral agents, refer to Appendix F, Drug Classification Tables, under Infectious Diseases.

**C. MEDICATIONS FOR
BEHAVIOR AND PSYCHIATRIC SYMPTOMS**

A common concern is the use of medications for control of behavior. Somehow using medication to control behavior is viewed differently than using medication to control blood pressure. In fact, in either case, an abnormality of physiology is causing the symptoms. The medication is simply correcting the abnormality. Medications do not, and cannot, plant thoughts in someone's brain nor control someone's thinking.

Stated another way, the theory of drugs used to alter behavior is that abnormal chemistry in the brain is resulting in undesirable and unacceptable behaviors. Medications help to straighten out the brain chemistry, and thereby eliminate some of the behavioral symptoms. A normally functioning brain is more

likely to respond to a behavior modification program. In fact, whenever medications are used for behavior, a behavior modification program should also be in place. Medications used for behavior should be reviewed periodically for the possibility of decreasing doses or stopping the medication once behavior modification is achieved.

1. Antipsychotic Agents:

Antipsychotic medications were first used about 50 years ago for the treatment of psychosis, hallucinations, delusions, and behavioral disorders. They were also found to be of benefit in treating manic episodes, agitation, delirium, impulse control, and other psychiatric disorders. Psychosis is a mental disorder characterized by impairment in reality testing as evidenced by delusions, hallucinations, incoherent speech, and disorganized or agitated behavior without awareness by the person of the behavior.

Terminology regarding these medications can be confusing. Neuroleptic is the term used in reference to the older “first-generation” antipsychotics which have a significant risk for causing Parkinson-type side effects. The newer drugs are referred to as “atypical antipsychotic” or “second-generation antipsychotic” drugs. These newer drugs have a much lower risk of causing Parkinson’s symptoms or tardive dyskinesia.

A. First-generation antipsychotics:

- Haloperidol (Haldol®)
- Chlorpromazine (Thorazine®)
- Thioridazine (Mellaril®)
- Perphenazine (Trilafon®)
- Fluphenazine (Prolixin®)
- Thiothixene (Navane®)

Side effects:

- Parkinsonian extrapyramidal side effects (EPS):
 - Rigidity (resistance of movement)
 - Tremor (unintentional, usually rhythmic muscle movement)
 - Bradykinesia (slow movement)
 - Akathisia (unpleasant sensations of inner restlessness often making it impossible to “sit still”)
- Tardive dyskinesia – see following page.
- Increased prolactin levels [hormone manufactured in the brain that causes lactation (production of breast milk) and also affects menstruation in females.]

B. Atypical or second-generation antipsychotics:

These have a much lower risk of development of EPS side effects and thus are more commonly used today rather than the first generation drugs. There is no one preferred choice for treatment of psychosis or manic symptoms. They work about as well as the first generation antipsychotics. They are however more expensive and often cause metabolic abnormalities and weight gain.

Second-generation antipsychotic drugs and side effects:

Medication:	Side effects:
Olanzapine (Zyprexa®)	Weight gain, sedation, akathisia, hypotension (low blood pressure), dry mouth and constipation
Quetiapine (Seroquel®)	Sedation, orthostatic hypotension (fall in blood pressure with standing), akathisia, dry mouth
Risperidone (Risperdal®)	Sedation, hypotension (low blood pressure), akathisia, prolactin elevation
Paliperidone (Invega®)	EPS side effects, akathisia, weight gain, prolactin elevation, fast heart rate
Ziprasidone (Geodon®)	Mild sedation, nausea, weakness, nasal congestion
Aripiprazole (Abilify®)	Headache, nausea, vomiting, akathisia, tremor, constipation
Clozapine (Clozaril®)	Weight gain, orthostatic hypotension (drop in blood pressure with standing), increase in blood sugar, sedation, constipation. It can also cause the bone marrow to stop making white blood cells which is why monitoring with white blood cell counts is mandatory for the duration of its use.

C. Metabolic syndrome:

The metabolic syndrome has been reported in many long-term users of antipsychotic medications. The metabolic syndrome simply refers to a cluster of factors that increases the risk for developing type 2 diabetes mellitus. These risk factors include obesity, hypertension, elevated glucose levels (due to abnormalities of insulin utilization), and elevated cholesterol and triglyceride levels. Because of this risk, it is important to monitor weight gain, as well as labs for glucose levels and lipids (cholesterol and triglyceride levels).

D. Tardive dyskinesia:

Tardive dyskinesia is still a possible side effect of long term treatment with the atypical or second generation antipsychotics. Tardive dyskinesia (TD) is the late-onset of a movement disorder which includes athetosis (constant slow, writhing movements, especially of the hands, that are involuntary), dystonia (disordered irregular contortions of the muscles), akathisia, stereotypical behaviors and tremor. You are not required to know these terms but listed below are some of the movement disorders that are seen with TD.

- Protruding and twisting movements of the tongue
- Pouting, puckering, or smacking movements of the lips
- Retraction of the corners of the mouth
- Bulging of the cheeks
- Chewing movements
- Fast eye blinking
- Twisting or “piano-playing” type finger movements
- Tapping foot movements
- Irregular breathing patterns
- Grunting noises
- Fast breathing
- Rocking and swaying movements
- Thrusting hip movements
- Shoulder shrugging

E. Issues in elderly patients: Black Box Warnings

In 2005, The US Food and Drug Administration issued a public health advisory regarding the use of these medications in elderly patients with dementia. In 2008, an updated advisory was issued with the same findings. Studies revealed an increase in death rate if these drugs were used for behavioral problems associated with dementia in the elderly.

Most individuals taking these medications are using them for behavioral problems and psychoses not associated with dementia. Other treatment options for this group of people simply are not available. Thus despite there being a “black box” warning for all antipsychotic medications stating that antipsychotics are not indicated for the treatment of dementia-related psychosis, these drugs are still used frequently in all populations. There has not been an increase in deaths in individuals who are prescribed these medications for the treatment of schizophrenia or other behavioral disorders as has been found when used in elderly dementia patients. In fact, individuals with schizophrenia who are not taking medications such as these, have a higher death rate than individuals who are taking antipsychotic medications appropriately. Physicians must weigh the risks versus the benefits of these medications before prescribing them. Quite often the benefit in quality of life far outweighs the risk.

2. Antidepressant medications:

Depression is a medical condition that can cause a wide variety of symptoms including extreme sadness that is persistent and interferes with daily activities and relationships. The exact cause of depression is still uncertain but it is felt that depression results from an imbalance of neurochemicals in the brain, including serotonin, norepinephrine, and dopamine.

Even though depression is a treatable condition, there are many people who still do not want to take medications. They often do not understand that treatment with medications can shorten the duration of the illness, reduce the likelihood of relapse and also treat many of the physical problems associated with depression such as aches and pains, fatigue and difficulty sleeping.

Treatment not only involves medications but also may include psychotherapy (counseling). Therapy with antidepressant medication helps to reestablish the normal balance of chemicals in the brain. Response to medications is often seen in as little as two weeks but often takes four to six weeks. The duration of treatment with antidepressant medications is recommended for at least six to nine months but may be life long. When antidepressants are stopped, they should be tapered slowly over at least two to four weeks as abruptly stopping these medications can cause some unpleasant side effects. Side effects associated with stopping the medication too quickly can include jitteriness, dizziness, nausea, fatigue, muscle aches, chills, anxiety, and irritability. Generally these side effects improve over one to two weeks.

There are several different classes of antidepressant medications. The medication that is chosen will depend on other medical conditions and other medications that a person is taking. For a full listing of common antidepressant and anti-anxiety medications, refer to Appendix F, Drug Classification Tables, under the Psychiatric section.

A. Selective Serotonin Reuptake Inhibitors (SSRIs)

These drugs increase brain levels of the neurochemical serotonin and include:

- ◆ Fluoxetine (Prozac®)
- ◆ Sertraline (Zoloft®)
- ◆ Fluvoxamine (Luvox®)
- ◆ Paroxetine (Paxil®)
- ◆ Citalopram (Celexa®)
- ◆ Escitalopram (Lexapro®)

Compared to most other antidepressants, SSRI's have fewer side effects. The most common include:

- Jitteriness or restlessness
- Agitation
- Insomnia
- Headache
- Nausea
- Diarrhea
- Sexual side effects such as difficulty having an orgasm

B. Mirtazapine (Remeron®)

This drug changes the levels of several neurochemicals in the brain, including serotonin. It also has antianxiety and sedative effects. Side effects include sedation, increased appetite and weight gain, and dry mouth.

C. Bupropion (Wellbutrin®)

This medication changes the levels of several neurochemicals in the brain but does not appear to have any direct effect on serotonin levels. It has a mild stimulant action and may be effective for those who have fatigue and poor concentration. Side effects are few but it has been associated with seizures in people with eating disorders. It may also cause mild anxiety, insomnia, and appetite suppression with weight loss.

D. Serotonin Norepinephrine Reuptake Inhibitors (SNRI's)

These medications alter several neurochemicals in the brain. They are especially effective in people who have had a poor response to other antidepressants. The two medications in this category include: venlafaxine (Effexor®) and duloxetine (Cymbalta®).

Common side effects include nausea, dizziness, insomnia, sedation and constipation. Effexor® may also cause an increase in blood pressure.

E. Tricyclic antidepressants

These are older medications that alter several different neurochemicals in the brain. These drugs have a number of side effects which limits their use. Medications in this class include amitriptyline (Elavil®).

There are many side effects associated with these drugs including:

- ◆ dry mouth
- ◆ constipation
- ◆ drowsiness
- ◆ confusion
- ◆ blurred vision
- ◆ nausea
- ◆ weight gain
- ◆ hallucinations.

F. Monoamine oxidase (MAO) inhibitors

These were the first drugs used to treat depression. These drugs block an enzyme that breaks down neurochemicals. Drugs in this class include tranylcypromine (Parnate®) and phenelzine (Nardil®).

Side effects of these drugs include dizziness, dry mouth, gastrointestinal upset, headache, and fatigue.

People taking these drugs must avoid certain foods (that contain tyramine) due to the risk of severe elevated blood pressure that can develop with the combination of tyramine and MAOI's. These foods and drinks include fermented cheese, imported beer, some wines, soy sauces, avocados, bananas, and any fermented, smoked or aged fish or meat.

G. Trazadone

Trazadone is often used for sleep disturbances. The specific actions of trazadone (Desyrel®) are unknown but may be related to altering levels of serotonin. Side effects include: sedation, nausea, and lightheadedness.

3. Antianxiety drugs:

The normal response to a stressful situation is feeling anxious. However some people feel excessively anxious for most of the day and night. These people have feelings of worry and anxiety that are difficult to control and impact daily functioning.

Symptoms:

- excessive worry
- feelings of being “on edge”
- feelings of dread
- fatigue and muscle tension
- chest tightness and abdominal pain

Treatment includes therapy as well as medications. Antidepressants are often used as these may help reestablish the normal balance of chemicals in the brain. The SSRI's and SNRI's are frequently used in this situation.

Benzodiazepines also lower the level of anxiety. They work quickly and can be taken only when needed. However if taken regularly for a long period of time, their effectiveness can wear off. See more information on benzodiazepines below.

A. Buspirone

Buspirone (Buspar®) is an antianxiety medication that works quite well. However it takes several weeks to begin working and can cause significant nausea as well as headache and drowsiness.

4. Sedative-hypnotics

The term “sedative-hypnotics” refers to a class of drugs that includes benzodiazepines, barbiturates, and other drugs. A sedative lowers excitement and calms the awake patient. A hypnotic produces drowsiness and promotes sleep.

Benzodiazepines are the most widely used sedative-hypnotics. They are also used for treatment of anxiety, seizures, and muscle spasms. They are relatively safe though there are issues related to potential abuse, withdrawal, and side effects with these drugs.

A. Barbiturates

These include secobarbital (Seconal®), phenobarbital (Luminal®) and butalbital (Fioricet/Fiorinal®) as well as others. These are mostly used for induction of anesthesia though Fioricet® is also sometimes prescribed for migraines and phenobarbital has been used to treat seizures.

This group of drugs causes sedation but at higher doses can lead to loss of consciousness, coma, and ultimately, fatal respiratory and cardiovascular depression.

B. Benzodiazepines

A few of the most commonly used benzodiazepines are listed. For a more complete list, refer to the medication tables in Appendix F.

- Alprazolam (Xanax®)
- Clonazepam (Klonopin®)
- Diazepam (Valium®)
- Lorazepam (Ativan®)

Benzodiazepines do have the potential for abuse. If the medication is used on a regular basis, abrupt stopping of benzodiazepines can cause **withdrawal symptoms** which include:

- Increased body temperature
- Elevated blood pressure
- Increase respiratory rate and heart rate
- Tremulousness
- Disorientation or delirium
- Psychotic behavior including hallucinations
- Seizures

C. Benzodiazepine-related hypnotics

These include the newer medications used to treat insomnia. They do not have the properties to treat anxiety, seizures, or muscles spasm as do benzodiazepines.

- Zolpidem (Ambien®)
- Zaleplon (Sonata®)
- Eszopiclone (Lunesta®)

Though these are relatively safe drugs, there still remains the potential for abuse. They also impair memory and ability to perform complex tasks in ways that are similar to benzodiazepines.

5. Stimulants

Stimulants are the most commonly used drugs for the treatment of ADHD (attention deficit hyperactivity disorder) in adults. These agents stimulate the release of agents (catecholamines) in the brain. They appear to increase some cognitive functions that impact a number of daily living skills.

A number of stimulant preparations are available. Most contain methylphenidate and are either short-acting (immediate release) or long-duration. Other stimulants are amphetamines.

Side effects include increased heart rate, elevated blood pressure, sleep problems, decrease of appetite and weight loss. There is a risk for substance abuse with these drugs.

Stimulants include:

- Methylphenadate: Ritalin®, Metadate®, Methyline®, Concerta®
- Dextroamphetamine: Dexadrine®, DextroStat®
- Amphetamine mixed salts: Adderall®
- Lisdexamfetamine: Vyvanse®

Atomoxetine (Strattera®) is also used in ADHD but is considered a non-stimulant. It could be categorized as an antidepressant but it works similarly to stimulants. Side effects include dizziness, elevated blood pressure, headache, sleep problems, decreased appetite and weight loss, nausea, dry mouth and constipation.

D. CARDIOVASCULAR DRUGS

This class of medications is used to treat things that we commonly associate with the heart such as high blood pressure, high cholesterol, etc.

1. Antihypertensive drugs

Hypertension is the medical term for high blood pressure. If hypertension is not treated, there is increased strain on the heart and arteries which can eventually cause damage. Hypertension increases the risk for heart attacks, heart failure (CHF), and stroke. It can also cause kidney damage. There are a number of different drugs that can be used to treat high blood pressure. Some of those categories are listed below. For a more complete list refer to Appendix F, Drug Classification Tables, Cardiovascular section.

A. Diuretics

Diuretics lower blood pressure mainly by causing the kidneys to excrete (get rid of) water and sodium to reduce the fluid volume throughout the body. They include such drugs as hydrochlorothiazide (HCTZ), Lasix®, and Dyazide®.

Side effects can include fatigue, dizziness, weakness as well as decreased levels of potassium and sodium.

B. ACE inhibitors (angiotensin converting enzyme inhibitors)

These block production of a hormone that narrows blood vessels. Narrowed blood vessels are one cause of high blood pressure. The most common side effects of this group of drugs is a dry cough. Lisinopril and enalapril (Vasotec®) are two commonly used ACE inhibitors.

C. ARBs (Angiotensin II receptor blockers)

These block the effects of a hormone on cells in the heart and blood vessels. They widen blood vessels and reduce blood pressure. The main difference between these medications and ACE inhibitors is that these do not produce a cough. Dizziness, drowsiness, headache, nausea, dry mouth, and abdominal pain can be seen. Diovan® and Cozaar® are two of the ARBs.

D. Calcium channel blockers

These reduce the amount of calcium that enters the muscles of the heart and blood vessels causing the muscles to relax and blood vessels to dilate. They reduce blood pressure and also reduce the force and rate of the heartbeat.

Procardia®, Cardizem®, and Norvasc® as well as others are included in this class of drugs.

Side effects include headache, dizziness, flushing, nausea. Verapamil often causes constipation. Diltiazem (Cardizem®) and Verapamil (Verelan®) can lower the heart rate too much at times.

E. Beta blockers

These drugs block some effects of our sympathetic nervous system which increases heart rate and raises blood pressure with stress and activity. There are many different beta blockers including metoprolol, atenolol, and propranolol. They can worsen asthma and mask the symptoms of low blood sugar in persons treated with insulin for diabetes. They can cause fatigue, dizziness, slow heart rate and a decreased ability to exercise.

F. Alpha blockers

These drugs relax the muscle in the walls of blood vessels thus allowing them to widen and thereby lower blood pressure. An increase in blood vessel diameter is known as **vasodilation**. Side effects of this group of drugs include dizziness, headache, drowsiness, and they may also increase the risk of developing heart failure.

2. Treatment of hyperlipidemia

Hyperlipidemia refers to increased levels of lipids (fats) in the blood, including cholesterol and triglycerides. Elevated lipids do not cause symptoms but do increase the risk for heart attacks and strokes. There are many different types of lipid particles (lipoproteins), the two most commonly measured are;

- LDL (low density lipoprotein), often referred to as “bad cholesterol”, is a more accurate predictor of developing heart disease than total cholesterol.
- HDL (high density lipoprotein), the “good cholesterol”, has protective effects on the heart. A high level of HDL is good for the heart

Triglycerides are the larger fats in the blood. High levels not only increase the risk of heart disease, but can also contribute to developing pancreatitis.

A. Medications

For a complete list refer to Appendix F, Drug Classification Tables, Cardiovascular section.

1. **Statins:** are used to treat high cholesterol levels. They are the most powerful drugs for lowering LDL cholesterol and are the most effective for prevention of heart attacks and strokes. They decrease the production of

- cholesterol by the body. They can lower triglycerides also, and slightly raise HDL levels. The most common side effects are muscle and joint pain. Zocor® and Lipitor® are two commonly prescribed statins.
2. **Ezetimibe** (Zetia®) impairs the body's ability to absorb cholesterol from food as well as the cholesterol that the body produces.
 3. **Fibrates** lower triglyceride levels and increase HDL. (Lopid® and Tricor® are two medications in use today. They can cause muscle toxicity (causing muscle pain and weakness) especially when used with statins

E. RESPIRATORY DRUGS: INHALERS

Asthma is a very common lung disease that is caused by narrowing of the airways in the lungs. This narrowing is partially or completely reversible. It causes symptoms of wheezing, coughing, chest tightness, and shortness of breath. Other lung diseases that have narrowed airways include chronic obstructive pulmonary disease (COPD), emphysema, and bronchitis. For a more complete listing of inhalers, refer to Appendix F, Drug Classification Tables, Respiratory section.

1. Bronchodilators:

Short-acting bronchodilators relieve asthma symptoms rapidly by temporarily relaxing muscles around the narrowed airways. These are usually given with a metered dose inhaler but can also be given via a nebulizer. A commonly used bronchodilator is Albuterol (Proventil®).

Side effects include rapid heart rate, feeling shaky, and anxiety.

2. Inhaled glucocorticoids:

Glucocorticoids, also known as corticosteroids, are usually used on a daily basis and act to decrease inflammation (swelling) of the airways. Flovent® and Aerobid® are two examples of these.

Side effects: since very little of the inhaled corticosteroid is absorbed into the bloodstream, side effects are few. The most common side effect is development of thrush (oral yeast infection). A hoarse voice and sore throat are also sometimes seen.

3. Long-acting bronchodilators:

Treatment with these is often recommended, in combination with inhaled corticosteroids, for treatment of persistent symptoms and in chronic diseases such as COPD. The short-acting bronchodilators only work for about 4 to 6 hours. The long-acting bronchodilators work for 12 hours or more. Advair® is a commonly used long-acting bronchodilator which also contains a corticosteroid.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Self-Study Questions Section VI

Self-study Questions Section VI. Categories of Medications

1. T F Ibuprofen is an NSAID and can cause gastrointestinal side effects.
2. T F All antibiotics work the same.
3. T F Tylenol and aspirin both have anti-inflammatory effects.
4. T F Athlete's foot is a fungal infection.
5. T F Antibiotics work on viral infections such as the common cold.
6. T F Sedative-hypnotics are sleeping pills.
7. T F Elevated cholesterol levels can lead to strokes and heart attacks.

Matching:

- | | |
|--|-------------------------------------|
| 8. ___ is a substance that kills or slows the growth of bacteria. | a. antifungal |
| 9. ___ is a substance that prevents or stops seizures. | b. antihypertensive |
| 10. ___ is a drug classification that induces sleep. | c. analgesic |
| 11. ___ is elevation of cholesterol and triglycerides in the blood stream. | d. bronchodilator |
| 12. ___ is a drug classification used to treat pain | e. antibacterial |
| 13. ___ is a drug that treats elevated blood pressures | f. sedative/hypnotic |
| 14. ___ is a drug classification for asthma symptoms | g. hyperlipidemia |
| 15. ___ is a drug classification used to treat fungal infections | h. antiepileptic/
anticonvulsant |

16. Benzodiazepines:

- a. are used to treat anxiety
- b. Lorazepam (Ativan®)
- c. are sedative-hypnotics
- d. zolpidem (Ambien®)
- e. all of the above
- f. a, b, and c.

17. Antipsychotics include:

- a. Haldol®
- b. Abilify®
- c. Drugs that can cause Parkinson's symptoms
- d. Prozac®
- e. Drugs that can cause tardive dyskinesia
- f. all of the above
- g. a, b, c, and d
- h. a, b, c, and e.

VII. SEIZURE DISORDERS (EPILEPSY)

The brain contains billions of nerve cells that create and receive electrical impulses. Neurons (nerve cells) communicate through these electrical impulses. When there is abnormal and excessive electrical activity in the brain, a seizure occurs. This causes an altered level of awareness, changes in behavior, and/or muscle contractions and movements typically seen during a seizure. Characteristics of seizures depend on location and path of electrical discharges. Generally this activity only lasts for seconds to minutes.

A. CAUSES OF EPILEPSY

Less than a half of epilepsy cases have a cause that can be identified. Most of those cases are presumed to be genetically determined (inherited). For those cases in which a cause can be determined, most involve some sort of brain injury and include:

- Head trauma
- Brain tumors
- Stroke
- Intracranial infection (an infection in the structure which contains the brain)
- Congenital (born with) brain malformations
- Cerebral degeneration or atrophy (shrinkage often caused by decreased blood supply). The cerebrum is the part of the brain associated with higher mental functions such as memory, learning, reasoning, judgment, intelligence and emotion.

1. Provoked seizures:

Seizures can be provoked by a number of medical disorders. A provoked seizure is one which occurs because of some abnormality. Once the abnormality is corrected, the seizure will no longer occur. These include:

- Low blood or very high blood sugars
- A fall in blood sodium levels that occurs over a short period of time
- Very low calcium levels
- Kidney failure
- Hyperthyroidism (the thyroid is over-active)
- Anoxia (low oxygen levels) which can be due to heart problems, respiratory arrest, carbon monoxide poisoning, drowning, or problems with anesthesia
- Drug toxicity (such as a Dilantin level that is too high)
- Drug withdrawal states (especially the withdrawal of alcohol or benzodiazepines such as Ativan® or Valium®)

2. Imitators of epilepsy:

Several conditions look like seizures but are not. The most common of these are:

- Syncope (fainting spells)
- Psychological disorders (such as schizophrenia)
- Sleep disorders
- Paroxysmal movement disorders (sudden movements such as spasms)
- Migraines
- Transient ischemic attack (TIA) which is a small stroke or transient (temporary) lack of blood flow resulting in a neurologic deficit for a few minutes to a few hours.

3. Photic-induced seizures:

Photosensitivity (increased sensitivity to light) can also trigger seizures. The light stimulation may come from a natural or artificial source, in particular television, video games or other sources of flickering light. Children are more susceptible than adults and females appear to be more susceptible than males. A tendency for photic-induced seizures may be inherited. Seizures caused by this are usually generalized but may be partial.

B. TYPES OF SEIZURES

Seizures have many forms depending upon the type and cause. Symptoms can be mild or severe. Seizures are classified according to the patient's appearance or behavior during the seizure and the pattern of electrical activity in the brain, as measured by an electroencephalogram (EEG).

It is difficult, even for trained physicians, to classify seizures based on what someone looks like while having a seizure. Though it is good to know the different types of seizures as listed below, when you witness and report a seizure, it is more important to be able to describe what you saw rather than classify it or give it a name. Pay attention to what the individual is doing; what movements you see, what may have triggered it, the duration, etc., rather than trying to give it a name. Write these down on the seizure sheet and make sure they are reported to the physician.

1. Partial seizures:

Partial seizures arise from one area on one side of the brain and are also referred to as focal seizures. They are subdivided according to whether the person is aware and conscious during the seizure or whether there is some impairment or change of consciousness. Partial seizures can spread and become a generalized seizure, in which there is a loss of consciousness and the abnormal electrical activity affects most or all of the brain. Partial seizures are the most common type of seizure.

- **Simple partial seizures:** affect enough of the brain to cause symptoms but not interfere with consciousness. Symptoms vary depending on the region of the brain involved and may be sensory or motor:

Sensory:

- feeling an unusual sensation such as odd taste or smell
- seeing or hearing something specific
- a feeling of emotion such as sudden fear or anger
- an uncontrolled rhythmic twitching or stiffening movement in a limb
- difficulty speaking

Motor (focal motor)

- Caused by an outburst of activity in the brain causing a contraction of a group of muscles

- **Aura:** A seizure **aura** is a simple partial seizure which can occur as an isolated event or may precede complex partial or generalized seizures. Auras can be warning signs. Examples of **auras**:

- nausea
- dizziness
- headache and visions
- difficulty with speech or difficulty breathing
- numbness of hands, lips or tongue
- an unpleasant taste
- palpitations
- smells or hearing things

- **Complex partial seizure:** involves impairment of consciousness. The person affected may stare into space and may either remain motionless or engage in repetitive behaviors called **automatisms**. This type of seizure may be preceded by an aura and may lead to a generalized seizure.

Automatisms include:

- facial grimacing
- chewing, lip smacking, swallowing
- gesturing or snapping fingers
- repeating words or phrases
- walking, running, undressing

During the seizure, a person is not aware of his or her movements or surroundings. A person may become hostile or aggressive if physically restrained during a complex partial seizure. This type of seizure can last several minutes. Afterwards, the person will feel confused or tired and will not remember the events that occurred during the seizure. This is called a **postictal** state.

2. Generalized seizures:

Generalized seizures occur as a result of abnormal electrical activity throughout the brain. The person will be unconscious and unresponsive and may stiffen and have abnormal, jerking movements or few to no abnormal movements. Generalized seizures are classified as follows:

- **Absence seizures (petit mal):** During this type of seizure, a person may appear to be staring or daydreaming, and will not respond if spoken to. If the seizure lasts for 10 or more seconds, there may also be eye blinking or lip smacking (automatisms). There is no postictal state after the seizure and the person is usually unaware that anything has happened. These are often seen in childhood and disappear later in life.

The difference between absence and complex partial seizures:

- No aura occurs in an absence seizure.
 - An absence seizure comes on suddenly, with no warning.
 - Absence seizures do not last very long.
 - People recover quickly from absence seizures.
- **Tonic-clonic seizures:** These are also referred to as grand mal seizures, major motor seizures or convulsions. They are associated with a sudden loss of consciousness.
 - **Tonic** phase: all muscles of arms, legs become stiff and extended or flexed (skin may appear blue or cyanotic)
 - **Clonic** phase: muscles begin to jerk or twitch
 - Usually lasts a couple of minutes
 - Followed by postictal period, sometimes followed by a headache
 - Recovery can take several minutes to hours
 - **Myoclonic seizures:** “Myo” means muscle and “clonic” means contraction. Myoclonic seizures cause quick movements or jerks in a group of muscles on one or both sides of the body. This may cause the person to drop or throw objects they are holding. The person may fall off a chair and can fall to the ground. Because the seizure is so brief, consciousness is not usually impaired. These often occur in clusters and tend to occur upon awakening from sleep.
 - **Atonic seizures:** Also known as drop seizures, cause a sudden loss of muscle tone. These can involve the entire body and cause the person to suddenly drop or collapse. They may also involve just the head and neck causing a sudden head nod. There is a risk of head and facial injuries associated with this type of seizure, and protective head gear may be recommended.

3. Status epilepticus:

The term status epilepticus generally refers to the occurrence of a single unremitting (not stopping) seizure with a duration longer than 5 to 10 minutes (a continuous state of seizure). It can also refer to recurrent seizures without regaining consciousness between the seizures. The person does not have time to recover from the first seizure before the next one begins. Status epilepticus is considered a medical emergency as ongoing seizure activity results in damage to brain cells. However in rare cases, a person's usual seizure activity could meet the criteria for status epilepticus and that person should have a protocol in place for how one should treat seizures that are unremitting.

C. FIRST AID FOR SEIZURES

If you observe someone having a seizure, do not panic. Seizures are usually brief – lasting not more than a few minutes – although they seem longer.

1. If the person has not yet fallen, help the person to the floor to prevent injury. Place a small pillow or rolled-up garment under the head.
2. Once a seizure has started, it cannot be stopped without medication such as Diastat®. Do not try to restrain or revive the person having the seizure. Remain calm; do not leave the person alone. If the person has a vagus nerve stimulator, use the magnet if you have been trained in its use.
3. Clear the surrounding area of hard, sharp, or hot objects which might be harmful if bumped. If you cannot move an unsafe object, kneel or stand between that object and the person to protect them from striking it.
4. Do not force anything between the teeth. Despite the myth, it is nearly impossible for a person to swallow his own tongue. Nothing should go into the person's mouth. A person may bite his tongue or cheeks, but putting something into the mouth increases the chance of breaking the object or choking on it.
5. Make sure breathing is unobstructed. Turn the person's head to the side. Loosen scarves, collars, tight clothing. Do not interfere with movement.
6. Speak calmly and reassuringly. The person may be able to hear what is said during the episode. It will also help you and others remain calm.
7. If a person is passing from one seizure into another without regaining consciousness, a physician's help is needed immediately. Generally after 5 minutes of seizure activity, help should be obtained. The situation is critical and potentially fatal. Call 911. (Keep in mind that some individuals may have a protocol for when 911 should be called.)

1. Special circumstances:

- **A seizure in water.**

If someone is having a seizure in water, you want to make sure the person gets enough air and doesn't breathe water into the airways.

- Support the person in the water with his head tilted so that the face and head stay above water.
- Get the person out of the water as quickly as possible.
- Once on a dry surface, if the person is not breathing, begin artificial respiration.
- The person should be transported to the emergency room for a medical evaluation even if he appears fully recovered. Respiratory problems or delayed shock are possible in such cases.

- **A seizure in a wheelchair.**

- Check to see if the person is secured. If the person is secured, there is no need to move him to the floor. If the person is not safely secured in the wheelchair, move him/her to the floor.
- If the wheelchair has padded surfaces that will protect the person from injury, then watch and assist the person afterwards.
- If any part of the wheelchair could hurt the person, such as a metal footrest, then pad that area to protect the person.

D. DOCUMENTATION

One of the most helpful things an observer can do is accurately document and describe the entire seizure. Record everything that happens, particularly:

1. Record the **date, place and time** of day the seizure occurred.
2. **Before** – record any unusual behavior, sensations, or feelings that the person may have shown or mentioned prior to onset.
3. **During** – record the sequence of behavior during the seizure:
 - How did it start?
 - Did breathing stop?
 - Did the skin turn blue (cyanotic)?
 - Were muscles tensed?
 - Did the person fall?
 - Did the person lose bowel or bladder control?
4. **Duration** or length – if possible use a watch because it is very difficult to estimate the amount of time that has passed.

5. Behavior **after** the seizure:

- When was full consciousness regained?
- Did the person have a headache?
- Was the person drowsy or confused?
- Were there any physical injuries?
- Was the person able to describe any aura prior to the seizure?
- Can the person remember anything that happened just prior or during the seizure?

E. FOLLOWING THE SEIZURE

Most seizures last only a minute or two. Be sure to remain calm and stay with the person having the seizure. General rules include:

- Never leave the person alone until he/she is awake or alert.
- Turn the person to the side to help saliva drain from the mouth.
- Cover the person with a blanket or coat.
- Maintain the person's privacy.
- Offer comfort and reassurance.
- Make sure the person feels comfortable before being left alone.
- Check the person frequently after the seizure.

F. FAKING SEIZURES

Generally, each person has the same seizure pattern during each seizure. If a person's seizures suddenly appear quite different from usual, you may suspect faking. This could also represent a change in seizure pattern or the development of a second type of seizure in that person. However you cannot second guess what is occurring so it is important to act professionally and do what is best for that person.

Often people like to get attention and having a seizure is one way to gain it. Even if you suspect a person is faking, remain calm and matter-of-fact just as you would for any seizure. A lot of attention or commotion should not surround this activity. If you suspect a person is faking seizures, look at why that may be. Is that person not getting enough one-on-one attention? Find ways to give attention for positive behaviors.

There are a couple of ways that are useful in trying to determine if someone is faking seizure activity. Vital signs (temperature, pulse, blood pressure, and respiration) go up immediately after tonic-clonic seizures. Check to see if this is the case.

Also, if a person is faking, you may spot them cushioning a fall, or aiming for a soft place to land. Someone having a real seizure cannot do this. When describing what took place, be sure to document this sort of action by the person.

Caution: Never take a chance that a person is faking. Always follow normal first aid procedures for seizures and report any new seizure activity to the person's primary care physician or neurologist.

G. INFLUENCING FACTORS

Sometimes changes in a person's life can trigger seizure activity. Medication is not the only thing that can help control seizures; lifestyle changes can also help decrease seizure frequency. Things that can influence seizures include:

1. Food and drink:

- **Coffee, cola, chocolate:** More than 125 mg of caffeine daily (about two cups of coffee) can affect seizures in three ways. First, it acts as a diuretic, causing the body to get rid of fluids and thus cause dehydration. Second, it may interact with some of the antiepileptic medications. Third, it is a stimulant that can excite nerve cells in the brain.
- **Alcohol:** Alcohol especially in large quantities or medications with alcohol, such as Nyquil®, can influence seizure activity. Alcohol interferes with antiepileptic medications. It can also cause sleepiness if mixed with medications that already have a sedating effect. But most importantly, it lowers the seizure threshold, making a seizure more likely to occur.

2. Amounts of food or fluid:

- **Drinking too few liquids** over a long period of time causes dehydration. With less body fluid to mix with, the antiepileptic medication can become too concentrated. This can trigger seizures. Also, the body's electrolytes (sodium, etc) may get out of balance and trigger a seizure.
- **Eating too little food** over a long period of time results in general poor health and increased stress on the body. Any stress can make a person more susceptible to seizures. Also lack of protein will interfere with certain medications such as Dilantin. Another effect will be low blood sugar which can cause seizures.
- **Fluid retention** is when the body holds too much fluid such as premenstrual syndrome or having a diet high in salt. This can affect seizure activity.
- **Constipation and Impaction.** There are no scientific studies proving a relationship between constipation/impaction and seizures, however, many people have noticed an increase in seizure activity when these occur.

3. Environment: various stimuli (something that influences or causes a reaction) in the environment, particularly those which are abrupt or very rhythmic, may trigger seizures in some people.

- **Visual stimuli:** as mentioned previously, there are photic-induced seizures. This includes anything that might flicker, flash, or have a strobing effect such as:
 - " Flashing video games or television screens
 - " Flash on a camera
 - " Certain visual patterns such as stripes or walking by a picket fence
 - " Automobile headlights
 - " Direct, bright sunlight or patterns of light shining through tree branches
 - " Rotating blades of a helicopter or ceiling fan
 - " Reflections from water or snow
- **Hearing:**
 - " Many different noises at once
 - " Sudden occurrence of one loud noise
 - " Specific songs or nursery rhymes
- **Movement:**
 - " Sudden movements
 - " Tapping
- **Other:**
 - " Hyperventilation (breathing too fast)
 - " Extreme temperatures or sudden drastic changes in temperatures
 - " Not enough rest or sleep
 - " Fever

H. TREATMENT

The management of individuals with seizure disorders is focused on three main goals: controlling seizures, avoiding side effects of treatment, and maintaining or restoring quality of life. The main method of treating seizures is anti-seizure medications or anticonvulsants. Other treatment methods include Vagus-nerve stimulators, surgery, and other non-pharmacologic therapies. These will be discussed below.

1. Medications

There are many drugs that can be used to treat seizures. Treatment is aimed at preventing seizures not stopping the seizure after it has begun except in certain cases. Anti-seizure drugs (anti-epileptic drugs) are also often used to treat psychiatric illnesses. Different seizure types respond to different anticonvulsants; different individuals respond to different anticonvulsants. The drug that a physician chooses to treat seizures will depend upon the type of seizures, the side effects of the drug, interactions with other drugs, cost, and how the specific drug works. Other considerations include the age of the person, other medical or psychiatric problems, and lifestyle.

Since anticonvulsants are intended to prevent seizures, they must be taken regularly as prescribed whether or not the person is having any seizures. In fact,

seizures are more likely to occur if an anticonvulsant is suddenly stopped; therefore, be sure not to run out of medication.

Some anticonvulsant dosages are adjusted by testing drug levels. When blood is drawn for this purpose, the time of the last dosage should be reported to the technician or nurse. This information is important for interpreting the result of the drug concentration (level). Some drugs also cause changes in the blood such as a low sodium level (hyponatremia), low white blood count, anemia, and liver problems. Thus many blood tests may be ordered by the physician to monitor therapy with antiseizure drugs.

If attempts at treating the seizures with just one drug are not successful, adding a second agent may be necessary. Some consumers require multiple medications to control their seizures. Freedom from seizures is the desired outcome, however, all too often, simply reducing the number of seizures a client has to a minimum is the best that can be done.

Side effects of antiseizure medications vary but often include:

- Nausea
- Weight gain
- Fatigue, somnolence, drowsiness
- Headache or dizziness
- Hyperactivity and insomnia

Some of these side effects decrease after the drug has been taken for several weeks. For a full listing of medications refer to Appendix F: Drug Classification Tables under Antiepileptic/Anticonvulsant Agents in the Nervous System Section.

Treating a seizure once it has started:

At times it is necessary to try to stop seizure activity because for some, it often leads to status epilepticus. This is a very dangerous situation which must be dealt with quickly by either calling 911 or in some cases, using something such as Diastat® which is the benzodiazepine Valium®. Diastat® is a rectal gel that is inserted into the rectum by a rectal syringe.

Instructions for giving Diastat:

Each agency will have specific training and protocols that must be learned prior to anyone being able to give this or any rectal medication.

- a. Position the person on his/her side
- b. Insert the tip of the rectal syringe into the rectum.
- c. Gently push in the plunger, quickly, over a few seconds.
- d. Remove syringe and hold the buttocks together for up to several minutes so that the gel won't be immediately expelled.
- e. Valium® (Diastat®) works quite quickly, often within 15 minutes.

Types of seizures and recommended treatment choices:

Following is a chart listing the recommended medications for treating the different types of seizures. As you can see, many of the same medications can be used for different seizure types.

Types of Seizures and Recommended Treatment Choices:

Primary generalized tonic-clonic seizures	Partial, including secondarily generalized seizures	Absence	Atypical absence, Myoclonic, Atonic
Valproate (Depakene®)	Carbamazepine (Tegretol®)	Ethosuximide (Zarontin®)	Valproate (Depakene®)
Lamotrigine (Lamictal®)	Lamotrigine (Lamictal®)	Valproate (Depakene®)	Lamotrigine (Lamictal®)
Levetiracetam (Keppra®)	Oxcarbazepine (Trileptal®)	Lamotrigine (Lamictal®)	Levetiracetam (Keppra®)
Carbamazepine (Tegretol®)	Levetiracetam (Keppra®)	Clonazepam (Klonopin®)	Topiramate (Topamax®)
Topiramate (Topamax®)	Topiramate (Topamax®)	Zonisamide (Zonegran®)	Zonisamide (Zonegran®)
Zonisamide (Zonegran®)	Valproate (Depakene®)	Levetiracetam (Keppra®)	Clonazepam (Klonopin®)
Oxcarbazepine (Trileptal®)	Gabapentin (Neurontin®)		Felbamate (Felbatol®)
Phenytoin (Dilantin®)	Zonisamide (Zonegran®)		
	Phenytoin (Dilantin®)		
	Pregabalin (Lyrica®)		

2. Nonpharmacologic therapies

There are other therapies for seizures that may be used along with anticonvulsant medications.

a. Surgical therapy

Individuals with persistent seizures despite adequate trials of medications are sometimes considered for surgical treatment. A number of surgical procedures are available but basically involve removing the part of the brain where seizures originate. These procedures are not without significant complications such as cognitive (perception and intellect) impairment, vision and speech problems, and hemiparesis (paralysis or inability to move one side of the body).

b. Vagus nerve stimulators (VNS)

In 1997, the FDA approved VNS treatment as additional therapy for adults and adolescents over 12 years of age whose partial-onset seizures were not adequately controlled by drugs. It is also used for generalized seizures. In 2005, it was also approved for use in treatment-resistant depression.

The vagus nerve is one of the 12 cranial nerves and is comprised of many nerve fibers that go to many regions of the body and the brain. Its name is derived from Latin meaning wandering. Cranial nerves conduct impulses or signals between the brain and other parts of the brain and various body structures. Some cranial nerves bring information from the senses (like touch, smell, or sight) to the brain (sensory) and some control muscles (motor). Other

cranial nerves, like the vagus, have both motor and sensory functions. The vagus nerve serves many organs and structures, including the larynx (voice box), lungs, heart, and gastrointestinal tract. One pathway goes to the forebrain (front part of the brain), to sites that are often found to generate seizures.

The vagus nerve stimulator (VNS) is a battery-powered device similar to a cardiac pacemaker. Leads (wires) are placed around the left vagus nerve in the neck and are connected to a small device which is placed just under the skin of the upper left chest. The stimulation intensity, frequency, duration and other parameters are programmed by a device (like a computer) by a technician or physician. Therapy with vagus nerve stimulation has been shown to be effective; however, the exact mechanism of how it works remains unknown. It has been shown to affect blood flow to various portions of the brain and to affect neurotransmitters including serotonin and norepinephrine.

The VNS unit can both prevent seizure activity and abort (stop) a seizure. The device is programmed to send electrical energy to the vagus nerve at a desired rate. However if a seizure is coming on or has started, a small magnet passed over the battery will discharge electrical activity. This can either prevent or shorten the seizure and allow for faster recovery of the patient.

c. Other therapies

There are several other treatments being studied and used but have not been proven scientifically to work and are not FDA-approved:

Intracranial electrical stimulation: (intracranial means within the skull.) The use of brain implants to provide focal(a small area) electrical stimulation within the brain is being studied. So far these have not proven to work well.

Transcranial magnetic stimulation: (Transcranial means through the upper portion of the skull.) Low frequency magnetic stimulation that is coming from a wire coil held outside the head. The magnetic field causes an electric current in nearby regions of the brain. It may reduce the excitability in the brain and may reduce seizure frequency. Studies are ongoing in this area.

Complementary therapies: Some herbal medicines may have anti-seizure effects, but have not been scientifically studied. Herbal medicines and dietary supplements can affect the metabolism of anticonvulsants and may alter drug levels, thus it is important to know if someone is taking these supplements.

Ketogenic Diet: The ketogenic diet is a special high fat, low carbohydrate diet that has been shown to help control seizures in some individuals. The proportion of fat to carbohydrate causes ketosis (formation of ketones in the blood), which appears to have a direct antiseizure effect. The diet is difficult to follow because of taste, etc. but if not followed strictly, it is not effective. Complications of the diet include dehydration, constipation, osteoporosis, kidney stones, and high cholesterol levels. This diet is mainly used in treating children and is usually discontinued after two years due to complications.

Self-study Questions Section VII. Seizure Disorders

1. Causes of epilepsy include:
 - a. brain tumors
 - b. head trauma
 - c. hypothyroidism
 - d. a and b
 - e. all of the above
2. The following conditions may mimic seizures:
 - a. movement disorders
 - b. fainting spells
 - c. migraines
 - d. a and d
 - e. all of the above
3. Which of these apply to seizure **auras**:
 - a. numbness of hands, lips, tongue
 - b. visions
 - c. it can be a warning that a seizure is coming
 - d. it can occur as an isolated event
 - e. all of the above
 - f. a, b, and c
4. Environmental factors may trigger seizure activity. Which of these could trigger seizure activity:
 - a. flash of a camera
 - b. talking
 - c. video games
 - d. running
 - e. very hot weather
 - f. b and c
 - g. a, c, and e
 - h. b, d, and e
5. Side effects of anti-seizure medications often include the following:
 - a. nausea
 - b. drowsiness
 - c. weight loss
 - d. headaches
 - e. all of the above
 - f. a, b, d only
6. If someone is having a seizure while in the water:
 - a. he is not at risk for breathing in water
 - b. you should get him out as fast as possible
 - c. you do not need to have him seen by a physician
 - d. begin artificial respiration while in the water
 - e. b and c

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Self-study Questions Section VII -

- 7. T F Low blood sugars can cause seizures.
- 8. T F Anticonvulsants are used only to treat seizures right at the time that each seizure starts.
- 9. T F If someone has a seizure that is very different from usual, you should assume the person is faking and not report it.
- 10. T F Withdrawal of alcohol or Ativan® (benzodiazepines) can provoke seizure activity.
- 11. T F If someone is having a seizure and begins to run around and undress, you should physically restrain that person.

First aid for seizures. During a seizure you should:

- 12. T F Force a tongue blade or stick between the person's teeth.
 - 13. T F Put a small pillow or soft clothing under the person's head.
 - 14. T F Restrain the person and restrict movement so that the person doesn't get hurt.
 - 15. T F Remove hot, hard or sharp objects from the area.
 - 16. T F Make sure breathing is not blocked.
 - 17. T F Record the behavior/events before, during and after the seizure.
18. List an example of an automatism: _____.
- 19 – 21. When someone has a seizure, you are required to document the date, time, length of the seizure and the place that it occurred. There are other pieces of information that also should be documented:
19. List one thing that would be important to document that occurred just prior to the start of a seizure: _____
20. List one thing that would be important to document that occurred during the seizure: _____
21. List one thing that would be important to document that occurred just following the seizure: _____

VIII. STROKES AND TIA'S

A. TIA'S (TRANSIENT ISCHEMIC ATTACKS)

TIA's by their very name are defined as a **transient or temporary** period of neurological dysfunction. This means that the brain is unable to tell the body what to do correctly. The symptoms begin suddenly and last less than 24 hours. They are caused by a temporary lack of blood supply (and thus lack of oxygen) to an area of the brain. They have also been referred to as "mini-strokes". Anyone who has experienced a TIA is at greater risk for having a stroke.

Most TIA's are caused by blockages to the major arteries leading to the brain. These arteries can become clogged or narrowed by plaques which are fatty deposits caused by cholesterol. Since the plaque partially blocks the artery, it is easy for a clot to form and either completely block the blood flow or at least slow it down so that the brain does not get the oxygen it needs.

In some cases, a clot forms elsewhere such as in the heart, and part of that blood clot breaks off and travels to the brain where it blocks a smaller artery. These are called emboli.

If an artery is blocked for more than a few minutes, the brain tissue starts to die. Symptoms will continue and brain injury (infarct) is seen on a brain scan. Then the person is said to have had a stroke. But when the symptoms resolve within 24 hours, it is called a TIA. Most TIA's last only minutes to an hour or two.

B. STROKES

A stroke is an injury that occurs in the brain when the blood supply and thus oxygen supply is cut off causing the brain tissue to die. This is due to either diseased blood vessels or an injury to blood vessels. There are two main types of stroke: those caused by blockages in the blood vessel (thrombotic strokes) and those caused by bleeding within the brain (hemorrhagic strokes).

The symptoms of a stroke may begin suddenly or develop over hours or days, depending on the type of stroke. Treatment of the two types is quite different. In both types of stroke, areas of the brain can become damaged leading to the inability to move one side of the body, inability to speak, or loss of a number of other functions. The damage can be temporary or permanent depending upon how much of the brain was damaged and how quickly treatment was started.

1. Types of strokes:

a. Ischemic stroke (thrombotic stroke or embolic stroke).

Ischemia means lack of oxygen. Ischemic strokes are caused by lack of blood flow and thus oxygen to the brain due to blockage of vessels. Most strokes are of this type.

- Thrombotic stroke: a blood clot forms in the arteries due to the presence of cholesterol plaques which cause narrowing.
- Embolic stroke: a piece of blood clot that is formed elsewhere in the body such as the heart breaks off and becomes lodged in the narrowed arteries in the brain. A piece of blood clot that breaks off is called an embolus.

b. Hemorrhagic stroke

Hemorrhage means to bleed. Hemorrhagic strokes occur when blood vessels of the brain leak or rupture, causing bleeding in or around the brain. One cause of a hemorrhagic stroke is an aneurysm. This is a blood vessel which has a weakness in its wall, often ballooning outward until it ruptures or breaks and then bleeds.

2. Risk factors for TIA's and ischemic strokes:

- Age over 40 years
- Heart disease such as atrial fibrillation (clots form more easily in the heart when someone has atrial fibrillation)
- Narrowing of the carotid arteries.
- High blood pressure
- Smoking
- Diabetes or elevated cholesterol levels
- Illegal drug use or heavy alcohol use
- Sedentary lifestyle and lack of exercise
- Obesity
- History of blood clots

3. Risk factors for TIA's and hemorrhagic strokes:

- Smoking
- Illegal drug use (especially cocaine and crystal methamphetamine)
- Use of warfarin or other anticoagulant medication

4. Symptoms:

Signs and symptoms of stroke or TIA often develop suddenly. They can resolve within 24 hours (TIA) or they can temporarily improve or slowly worsen depending on the area of the brain involved (stroke).

Classic symptoms can be recalled using the acronym **FAST**:

- **F**ace – sudden weakness or numbness of the face; drooping of one side of the face; blurred, double, or decreased vision
- **A**rm – Sudden weakness, numbness, or inability to move one or both arms
- **S**peech – difficulty speaking, slurred or garbled speech or inability to speak
- **T**ime – time is of essence in stroke treatment. The sooner treatment begins; the better the chances are for recovery.

However, this acronym does not cover one very important symptom of a stroke and that is: **sudden severe headache** with no known cause. This symptom is especially common with hemorrhagic strokes.

When we suspect someone is having a stroke, we may feel uncomfortable or unsure of our assessment of the situation. Here are some things that can be done to help these signs appear more clearly:

- Ask the person to smile - is one side of the face drooping?
- Ask the person to raise his/her arms - is one arm weak, is he/she unable to raise it?
- Ask the person to repeat words or speak - are the words garbled, is the person able to form words and sentences, is there difficulty understanding your question?

If the person is showing any of these signs and this is a new finding (for some individuals, these signs may have been present for a long time due to other neurological problems), then call 911 and get assistance immediately. Strokes can be treated if the person gets attention soon enough.

5. Diagnosis

Anyone with signs or symptoms of stroke needs immediate medical attention in an emergency department or hospital. There the proper diagnostic tests can be run and specialized treatment can be started quickly. If treated quickly, the amount of long-term damage that a stroke can cause can be minimized.

Most people presenting with signs and symptoms of a stroke will have blood tests done and imaging tests such as a CT scan or MRI of the brain. An electrocardiogram (ECG) of the heart is also often done.

6. Treatment

a. Acute:

Treatment of a stroke depends upon the type of stroke (ischemic or hemorrhagic) and the time since the first symptoms appeared as well as underlying medical problems that are present. For the acute treatment of a stroke caused by a clot (thrombus), thrombolytic therapy is often used if the person meets the criteria for its use. Thrombolytic therapy means that a drug that will break up the clot will be injected into a vein. Studies have shown that for this treatment to be effective, it is best given within 3 hours of symptom onset. It has also been shown to be of benefit if given within 4.5 hours. This is why there is the need to act quickly in order to prevent long-term damage.

b. Long-term:

The long-term therapy for both ischemic strokes and TIA's are the same using medications to prevent clots from forming. These therapies include antiplatelet therapy and anticoagulant therapy.

Antiplatelet therapy helps to prevent new clots from forming. Platelets are tiny, specialized cell fragments circulating in the blood stream that normally clump together to stop bleeding. This clumping leads to the formation of a blood clot. In strokes and TIA's, platelets clump together and form clots inside narrowed arteries. This plug caused by a clump of platelets or the clot that forms around this plug blocks blood flow. Medications that help prevent platelets from forming clumps include dipyridamole, clopidogrel (Plavix®), aspirin, and Aggrenox® (a combination of dipyridamole and aspirin).

Anticoagulant therapy decreases the formation of blood clots even in the presence of clumps of platelets already partially blocking a vessel. Anticoagulants are often, but incorrectly, referred to as blood thinners. There is a higher risk of bleeding with these so they are used less often than antiplatelet drugs after strokes. Heparin is one type of anticoagulant that is given by injection. Warfarin (Coumadin®) comes in pill form. It is often used in individuals with a higher risk of clot formation such as in those that have atrial fibrillation. Warfarin is a medication which must be carefully monitored to keep levels within therapeutic range. Generally, anyone taking Warfarin will have blood tests done (Protime and INR) once a month if the level is steady, and more frequently if needed. Many foods especially those containing vitamin K can affect this level. For more information on antiplatelet and anticoagulant medications, refer to appendix F, Drug Classification Tables under the Cardiovascular section.

Self-study Questions Section VIII Strokes and TIA's

1 through 3: Matching:

- | | |
|---|-----------------------|
| 1. _____ last less than 24 hours and are due to lack of oxygen to brain tissue. | a. hemorrhagic stroke |
| 2. _____ is caused by bleeding in the brain. | b. thrombotic stroke |
| 3. _____ is a stroke caused by a blood clot forming in a vessel in the brain. | c. TIA's |
4. List two risk factors for TIA's or strokes.
- a. _____
- b. _____
5. List two symptoms of a stroke.
- a. _____
- b. _____
6. T F A stroke is damage to the brain as a result of a blockage of a blood vessel or bleeding in the brain tissue.
7. T F Symptoms of a TIA generally occur suddenly and continue for days.
8. T F Aspirin can be used to help prevent strokes.
9. T F High blood pressure, diabetes, high cholesterol are risk factors for stroke.
10. T F A sudden headache is not a sign of a stroke.
11. T F If you think someone could be having a stroke, ask that person to smile.

IX. DIABETES MELLITUS

A. TYPE 1 DIABETES MELLITUS

Type 1 diabetes mellitus is a chronic medical condition that occurs when the pancreas produces little or no insulin. Insulin is needed for the body to absorb and use glucose and other nutrients. Without it, blood glucose (sugar) levels become elevated.

1. Symptoms of hyperglycemia (elevated or high blood sugar):

- Frequent urination leading to dehydration
- Fatigue
- Weight loss
- Excessive thirst
- Blurred vision

A life threatening condition called diabetic ketoacidosis (DKA) can also develop. With DKA nausea, vomiting, abdominal pain, rapid breathing, lethargy, decreased alertness and sometimes coma can occur. DKA is a medical emergency and requires prompt treatment.

2. Causes:

Type 1 diabetes usually begins in childhood or young adulthood but can develop at any age. It develops when a person's immune system destroys the insulin-producing cells in the pancreas. This process can take months to years and there will be no signs of diabetes until more than 90 percent of the insulin-producing cells are destroyed. Developing diabetes may be an inherited process but it can also develop in persons with no family history of diabetes. Environmental factors, such as exposure to certain viruses and foods early in life, may trigger the autoimmune response leading to the development of the disease.

3. Treatment:

Insulin treatment replaces the body's own insulin, restoring normal or near-normal blood glucose levels. There are several different types of insulin which are classified by how quickly they begin to work and how long they remain active. Some start working in as little as 5 to 15 minutes but generally only last 2 to 4 hours. Others don't start to work for about two hours, but last for as long as 24 hours. A combination of short acting and long acting insulin is often prescribed. Insulin therapy is given by injections or can also be given by an insulin pump.

B. TYPE 2 DIABETES MELLITUS

Type 2 diabetes mellitus occurs when the pancreas no longer works correctly to produce insulin or the tissues of the body don't respond in the correct manner to the insulin produced.

As with type 1 diabetes mellitus, prior to diagnosis, individuals may have symptoms of high glucose including frequent urination, excessive thirst, and blurred vision. However most people with type 2 diabetes have no symptoms at all which can delay diagnosis.

1. Causes:

Type 2 diabetes is probably caused by the interaction of environmental factors as well as genetic factors (heredity) which predisposes an individual to developing it. Many people have family members with diabetes. There are also medical conditions or factors which are associated with developing diabetes. These include high blood lipid (fat) levels, high blood pressure, and obesity. Environmental factors such as diet and activity levels also play a role in the development of type 2 diabetes.

2. Treatment:

There are many oral medications available to treat type 2 diabetes. Metformin (Glucophage®) is often the first medication used if lifestyle changes such as weight loss, increased activity, and diet have not worked well enough. Metformin improves the body's response to insulin to reduce high blood sugar levels. Diabetes medications are listed in Appendix F, Drug Classification Tables, in the Endocrine section. Insulin therapy may also be necessary in order to control high glucose levels.

C. GLUCOSE TESTING:

The goal of treatment in diabetes is to keep the blood sugar at normal or near-normal levels to help prevent both short and long-term affects of high sugars. Glucose levels can be checked by taking blood from a vein or fingertip. Levels are often checked before the first meal of the day (fasting), but may also be monitored before or after other meals during the day. The normal fasting glucose goal is generally 80 to 120 mg/dl although some people may have a different goal set by their physician.

The HgbA1C (hemoglobinA1C) test is also used to monitor blood glucose control. This test measures the average blood glucose level during the past two to three months. The goal for most people is 7.0 percent or less. This would correspond to an average glucose level of 150.

D. LONG-TERM HEALTH COMPLICATIONS:

1. Cardiovascular (heart):

The most common long-term complication of diabetes is cardiovascular (heart) disease including heart attacks, angina (chest pain), stroke or even death. People with diabetes have twice the risk for developing heart disease as the person without diabetes. This risk can be lowered with lifestyle changes such as quitting smoking, taking aspirin daily and managing high blood pressure and high cholesterol levels with diet, exercise and possibly, medications.

2. Kidney complications:

Diabetes can alter how the kidneys work which is called nephropathy. To monitor this, the urine is tested for proteins (albumin) to determine if diabetes is affecting the kidney's filtering action. Over time, when diabetes is not properly treated, the kidneys can stop functioning altogether leading to the need for dialysis.

3. Eye complications:

Diabetes can cause complications in the eyes called retinopathy. Retinopathy refers to damage to the retina (back of the eye). Most commonly it is caused by a problem with the blood supply to the retina. Other conditions besides diabetes that can lead to retinopathy include hypertension, direct sunlight exposure and some drugs. It is important for regular eye exams to detect this at an early stage when it can be monitored and treated to preserve vision. If not treated, it can progress to serious vision loss or blindness.

4. Vascular/nervous system problems:

Diabetes can decrease the blood supply to the feet and damage the nerves that carry sensation. This is why someone with diabetes can have an injury in a foot and not notice it due to the lack of pain sensation. The feet are at risk for complications such as foot ulcers, infections and development of gangrene. Checking the feet daily for breaks in the skin, ulcers, blisters, areas of increased warmth or redness, or any other changes is important and any abnormalities found should be reported.

E. HYPOGLYCEMIA

Hypoglycemia can be a frightening, unpleasant and dangerous complication of diabetes. Normal people have mechanisms in place that stop the release of insulin when blood sugar levels fall too low. However type 1 diabetics cannot regulate their insulin in this way as they are being given the insulin in the form of injections. They must rely on other responses that the body has in place to raise their glucose levels by trying to stimulate production of insulin and decrease the use of glucose by the body. Type 2 diabetics have fewer problems with this but sometimes their built in responses are defective

1. Causes:

Hypoglycemia can occur when a person with diabetes does one or more of the following:

- Takes too much insulin (or oral drugs that increase insulin secretion)
- Does not eat enough food
- Exercises vigorously without eating a snack or decreasing the dose of insulin beforehand
- Waits too long between meals
- Drinks excessive alcohol

2. Symptoms:

Early stages: (sugar levels below 60 to 70 mg/dl)

- " Tremor, sweating, anxiety, hunger, palpitations, loss of inhibitions.

At levels below 50 to 55 mg/dl:

- " Lack of coordination, weakness, blurred vision.

Later symptoms include:

- " Lethargy or confusion at levels below 45 to 50 mg/dl
- " Loss of consciousness or coma at levels of about 30 mg/dl
- " Seizures at levels of about 20 mg/dl with death shortly thereafter

3. Treatment:

To treat early symptoms, a person should eat 10 to 15 grams of a fast-acting carbohydrate such as:

- Three to four glucose tablets
- 1/2 cup of sweetened fruit juice
- Six to eight hard candies

This is usually enough to raise the glucose level into a safe range without causing hyperglycemia (high blood sugars). Foods that contain fat (like candy bars) or protein (cheese) should initially be avoided, since they slow down the body's ability to absorb glucose.

After 15 minutes, the glucose level should be measured again. If the blood glucose level is below 60 mg/dl, or if symptoms have not resolved, another 10 to 15 grams of fast-acting carbohydrate should be given.

Once glucose levels are under control, a snack may be needed to control the glucose level until the next meal.

Treatment of severe hypoglycemia:

When the person is unconscious or not able to ingest anything, an injection of glucagon or IV administration of glucose is needed. In these cases, 911 must be called immediately. The board of nursing believes that the administration of glucagon cannot be delegated to unlicensed personnel. Glucagon is a medication given as a shot or through a vein which is used to treat very low blood sugars. It stimulates the liver to produce sugar and also stimulates the heart and may lower blood pressure. Nausea and vomiting are two other possible side effects from this medication.

F. PROCEDURE: TESTING BLOOD GLUCOSE LEVELS

The following steps include general guidelines for testing blood glucose levels. Specific details for individual blood glucose monitors should be obtained from the package insert or a healthcare provider.

1. Wash hands with soap and warm water. Dry hands. This is for both the person assisting with the testing and the individual getting the test done.
2. Prepare the lancing device by inserting a fresh lancet. Lancets should only be used once and then discarded appropriately. Lancets that are used more than once are not as sharp and can cause more pain and injury to the skin.
3. Prepare the blood glucose meter and test strip (instructions for this depend upon the type of glucose meter used).
4. Use the lancing device to obtain a small drop of blood from the fingertip or alternate site such as the skin of the forearm, palms, thighs, and calves. Alternate sites are sometimes less painful than the fingertip but results are not as accurate when the blood glucose level is rising or falling rapidly. You should always use the fingertip unless ordered to use an alternate site by the individual's physician.
 - a. Person's who have difficulty getting a good drop of blood from the fingertip can try rinsing the fingers in warm water, shaking the hand below the waist, or squeezing ("milking") the fingertip.
5. Apply the blood drop to the test strip in the blood glucose meter. The results will be displayed after several seconds.
6. Record the blood glucose level on the appropriate form. If the reading is low or high, there may be parameters in place for notifying appropriate healthcare members such as a nurse or physician.
7. Dispose of the used lancet in a puncture-resistant sharps container (not in the regular trash).

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Self-study Questions Section IX

Self study Questions Section IX. Diabetes mellitus

1. Symptoms of hyperglycemia (high blood sugar) include:
 - a. blurred vision
 - b. frequent urination
 - c. fatigue
 - d. thirst
 - e. all of the above

2. Long term complications of uncontrolled diabetes include:
 - a. heart attacks
 - b. high blood pressure
 - c. blindness
 - d. gangrene
 - e. a, c, d
 - f. a, b
 - g. all of the above

3. For early symptoms of hypoglycemia (low blood sugar), the person should take:
 - a. hard candy
 - b. chocolate candy bars
 - c. cheese
 - d. fruit juice
 - e. glucose tablets
 - f. a, b, d
 - g. a, d, e
 - h. b, d, e

4. Which of the following can cause hypoglycemia (low blood sugar) in a person with diabetes?
 - a. eating sweets
 - b. exercising vigorously before eating
 - c. drinking alcohol
 - d. taking too much insulin
 - e. a, b, c
 - f. b, c, d

5. When someone has diabetes, it is important to check his/her feet daily because:
 - a. injuries to the feet may not be noticed due to lack of sensation
 - b. diabetics are at risk for infections
 - c. diabetes can decrease the blood supply to the feet
 - d. all of the above

6. T F Type 1 diabetes mellitus always begins in childhood.

7. T F Type 2 diabetes mellitus is never treated with insulin.

8. T F The most common long-term complication of diabetes is heart disease.

9. List two symptoms of hypoglycemia (low blood sugar):
 - a. _____
 - b. _____

10. When checking a diabetic's feet you should report (list 2):
 - a. _____
 - b. _____

X. GASTROINTESTINAL SYSTEM

A. GASTROESOPHAGEAL REFLUX

Gastroesophageal reflux (GER) occurs when stomach contents back up (reflux) into the esophagus. This is a normal process that happens in healthy individuals. Most of the time, episodes are brief and cause no symptoms.

Individuals with gastroesophageal reflux disease (GERD) however, experience symptoms as a result of reflux. These symptoms include heartburn, vomiting, or pain with swallowing. Heartburn is described as a harsh burning sensation in the upper abdomen or chest and the discomfort can radiate to the throat and neck. The reflux of stomach acid can even affect the vocal cords or be aspirated into the lungs.

1. How does reflux occur?

When we eat, food goes from the mouth to the stomach through the esophagus. This structure is made up of muscle layers and tissue that expand and contract to propel food to the stomach through a series of wave-like movements called peristalsis.

At the lower end of the esophagus is the lower esophageal sphincter which is a circular ring of muscle. This structure remains closed until swallowing forces it open. Normally it closes again immediately after swallowing to prevent reflux. If the sphincter is loose or weak, liquids are able to escape back up into the esophagus. The material, which has mixed with stomach acids, causes irritation to the lining of the esophagus.

GERD can occur in any age group and it is estimated that at least 10% of the general population experience daily symptoms of the condition. Among the developmentally disabled population, the incidence increases to 15 to 20%. In this population, the condition often goes unrecognized as frequently the symptoms are not able to be communicated to others.

2. Signs and symptoms of GERD

Symptoms:

- Stomach pain (pain in the upper abdomen)
- Non-burning chest pain
- Difficulty swallowing (dysphagia), or food getting stuck in the esophagus
- Painful swallowing
- Persistent laryngitis or hoarseness
- Persistent sore throat

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Gastrointestinal System -

- Chronic cough, new onset of asthma, or asthma symptoms only at night
- Taste of acid in the mouth and throat
- Regurgitation of foods and fluids
- Worsening dental disease (from stomach acids)
- A sense of a lump in the throat
- Recurrent pneumonia
- Chronic sinusitis
- Waking up with a choking sensation

Signs:

- Blood in the stool
- Anemia from blood loss
- Inflamed throat
- Respiratory finding of asthma or aspiration
- Unexplained weight loss

Serious complications may develop including:

- Recurrent lung disease
- Scarring of the lungs (pulmonary fibrosis)
- Cyanosis (blue color to mucus membranes from inability to get enough air)
- Narrowing of the esophagus from scarring or ulcers of the esophagus
- Barrett's esophagus – this occurs when the normal cells lining the esophagus are replaced by a different cell type. There is an increased risk for cancer to develop in these cells.
- Esophageal cancer

3. Causes and Influencing Factors:

As mentioned above, reflux occurs when the lower esophageal sphincter (LES) relaxes inappropriately. There are many reasons for this but factors which contribute to reflux include:

- Alcohol, caffeine and nicotine all cause relaxation of the sphincter
- Constipation
- Eating too fast
- Immobility (being confined to a wheelchair, etc)
- Fatty foods, chocolate.
- Medication side effects
- Overeating or overfilling the stomach
- Being overweight
- Slow stomach emptying time such as is found in diabetics
- Scoliosis
- Supine or semi-recumbent positioning
- Swallowing disorder

4. Diagnosis:

It is usually diagnosed based on symptoms and response to treatment. Testing may include endoscopy which is using a small flexible tube to see the esophagus and stomach from the inside. The tube has a light and a camera that displays images. Biopsies (small samples of tissue) can be taken through this tube.

Another test is the Barium swallow (upper GI series) which involves swallowing Barium liquid and taking x-rays. Irregularities in the lining of the esophagus and stomach show up on the x-rays. Barium can also be seen refluxing back up into the esophagus.

5. Treatments and Interventions:

A. Lifestyle changes

1. **Weight loss:** Excess weight puts pressure on the stomach and can push stomach contents into the esophagus.
2. **Raising the head of the bed:** if the head of the bed is raised at least six to eight inches, gravity can help prevent stomach contents from going back up into the esophagus (refluxing).
3. **Avoid foods that can contribute to reflux:** some foods cause relaxation of the sphincter at the end of the esophagus. These foods include caffeine, chocolate, alcohol, peppermint, and fatty foods.
4. **Smoking cessation:** saliva helps to neutralize refluxed acid but smoking reduces the amount of saliva. Smoking also relaxes the sphincter.
5. **Avoid large and late meals:** lying down with a full stomach increases reflux. By eating three or more hours before bedtime, reflux may be reduced. Smaller meals prevent the stomach from becoming over distended which can also cause reflux.
6. **Avoid tight fitting clothing:** tight clothing can increase the pressure on the abdomen, forcing stomach contents into the esophagus.

B. Medications

1. **Antacids:** these are commonly used for short-term relief of symptoms. The acid is only neutralized briefly after each dose so they are not very effective. Examples include Tums®, Maalox®, and Mylanta®.
2. **Histamine agonists:** these reduce production of acid in the stomach. They are usually taken once or twice a day. They are less effective than proton pump inhibitors. Pepcid® is one example of these.
3. **Proton pump inhibitors (PPI's):** these are stronger and more effective at reducing stomach acid than histamine agonists. These medications include omeprazole (Prilosec®) and lansoprazole (Prevacid®).

For a more complete listing of these medications, refer to Appendix F, Drug Classification Tables, Gastrointestinal section.

C. Surgical treatment

1. Surgical treatment for reflux includes repairing hiatal hernias and strengthening the lower esophageal sphincter. The most common surgery is the Nissen fundoplication which involves wrapping the upper part of the stomach around the lower end of the esophagus. The outcome of this surgery is usually good but long term complications include difficulty swallowing, a sense of bloating and gas, and breakdown of the repair itself.

B. CHOKING

Choking occurs when something becomes lodged in the throat or trachea (windpipe). In adults, the object is usually a piece of food. In young children small objects such as parts of toys, may be swallowed.

Choking makes it impossible to breathe therefore the needed oxygen to the brain is cut off. First aid must be administered as quickly as possible.

The Universal sign of choking is **hands clutched at the throat**. Other signs of choking include:

- Inability to talk or cough
- Difficulty breathing or noisy breathing
- Blueness of the lips, skin, nails (cyanosis)
- Loss of consciousness

When someone starts to choke but is able to cough forcefully and is not turning blue, it is best not to do anything. Ask the person if he is choking. If he is able to answer the airway is only partially blocked. Stay with the person and encourage him to cough until the obstruction is cleared. Do not give someone who is choking anything to drink because fluids may take up space needed for the passage of air.

Someone with a complete airway obstruction is unable to answer by speaking and has signs as listed above. At this point, you must give emergency treatment.

There are two recommendations as far as what should be done for a choking victim. The **American Red Cross** recommends the “five-and-five” approach which includes back blows as well as the abdominal thrusts (the Heimlich maneuver). The **American Heart Association** recommends going directly to abdominal thrusts (the Heimlich maneuver). This has been a controversial topic for many years and there are arguments for and against back blows as the initial treatment. However, neither is wrong. What is important is that you do something to help the person who is choking as quickly as possible.

“Five-and-Five” approach (recommended by the American Red Cross):

- 1. First, deliver five back blows between the person’s shoulder blades with the heel of your hand.**
- 2. Next, perform five abdominal thrusts.**
- 3. Alternate between five back blows and five abdominal thrusts until the blockage is dislodged.**

If someone else is with you, have that person call 911 while you are performing the back blows and abdominal thrusts. If you are alone, perform back blows and abdominal thrusts first, before calling 911.

Heimlich Maneuver:

To perform abdominal thrusts (Heimlich maneuver) on someone:

- 1. Stand behind the person. Wrap your arms around the waist and tip the person slightly forward.**
- 2. Make a fist with one hand. Press hard into the abdomen with a quick, upward thrust, as if trying to lift the person up.**
- 3. Perform a total of five abdominal thrusts. If the blockage remains, repeat the cycle of back blows and abdominal thrusts until the object is dislodged.**

For someone who is pregnant or obese, position your hands a little bit higher (around the lower chest) than with the normal Heimlich maneuver, and perform chest thrusts.

If the person loses consciousness, gently lay him flat on his back on the floor. To clear the airway, kneel next to the person and put the heel of your hand against the middle of the abdomen, just below the ribs. Place your other hand on top and press inward and upward five times with both hands. If the airway clears and the person is still not responding, begin CPR.

Even if you are successful in clearing the airway, the person will still need evaluation by emergency personnel. If something is still in the person’s throat, or the person is still having trouble with breathing, emergency personnel are equipped to deal with this. The person may require intubation (putting a tube into the trachea or windpipe) or other treatment. Transportation to the hospital for further evaluation and treatment should take place.

C. CONSTIPATION

Constipation is the most common digestive complaint in the general population. It is a large problem for individuals with developmental disabilities due to many factors including medications, lack of exercise, physical disorders, and low water consumption.

Constipation refers to a disturbance in bowel habits, but has varied meanings. Stools may be too hard or too small, difficult to pass, or infrequent. Having fewer than three bowel movements a week also defines constipation. The need to strain or a sense that the bowels do not completely empty after a bowel movement also fits the criteria for constipation.

1. Causes:

There are many factors that contribute to or cause constipation. These include eating a diet too low in fiber, taking in too few calories or not enough liquids, decreased activities and medications.

A. Medical conditions contributing to constipation include:

1. Neurological disorders: multiple sclerosis, spinal cord injury, Parkinson's disease, Hirschsprung's disease, neuropathies, diabetes
2. Metabolic disorders: hypothyroidism, low potassium levels, pituitary problems.
3. Irritable bowel syndrome

B. Medications that can contribute to constipation include:

1. Pain medications (narcotics such as hydrocodone)
2. Anticholinergics: antihistamines (Benadryl®), antidepressants (amitriptyline), antipsychotics, muscle relaxers (Flexeril®)
3. Iron supplements
4. Aluminum containing medications such as antacids (TUMS®) or sucralfate
5. Some antihypertensives (blood pressure lowering medications such as Verapamil®)

2. Complications:

Constipation is uncomfortable and can interfere with quality of life. Chronic constipation can be associated with:

A. Hemorrhoids

B. Fecal (stool) impaction which can cause abdominal pain, nausea, vomiting, urinary retention and ulcers in the rectum.

C. Anal fissures which are painful tears in the anal canal caused by passing hard stool.

3. Treatment:

If specific treatable causes of constipation are not found, general management includes:

A. Behavior changes

The bowels are most active following meals and this is often the time that stool will pass most readily. When the signals to defecate (pass stool) are ignored, these signals become weaker and weaker over time. Encouraging and allowing persons to pay attention to these signals can help decrease constipation.

B. Diet

Fiber and water are the two most important components of our daily diet that help decrease constipation.

1. **Fiber:** the recommended amount of fiber is 20 to 35 grams daily. Breakfast cereals can be an excellent source of fiber. The product information panel on the box will help determine the number of grams of fiber per serving. Many different fruits and vegetables are also very high in fiber and helpful in treating constipation. Citrus fruits, prunes and prune juice are especially helpful. Please also refer to Appendix D for a table regarding the amount of fiber in various foods.

Psyllium powder (Metamucil®) mixed with 8 ounces of water or juice one to three times daily can also provide needed fiber. However, remember that consuming large amounts of fiber can cause abdominal bloating and gas so starting with a small amount and increasing the amount gradually is desirable.

Other fiber supplements include Citrucel®, Fibercon® and Benefiber®. These work by increasing the water content and bulk of the stool.

2. **Fluids:** fluid intake is extremely important to prevent and treat constipation. In general, an average individual needs about 2 liters (over 2 quarts) of fluids each day. Generally about 500 ml (one pint or 16 oz) comes from ingested water and 850 ml (about 30 oz) comes from food. Fluid requirements go up with sweating, illnesses (especially diarrhea), fever, activities, and heat. As an example, water requirements increase by 100 to 150 ml/day (3 to 5 oz) for each degree of body temperature elevation over 98.6 degrees F. When attempting to calculate the amount of ingested water by an individual, remember that fluids containing caffeine or alcohol act as diuretics and may cause dehydration. For each cup of a caffeinated or alcoholic beverage consumed, an extra half cup (4 oz) of plain water should be added that day.

C. Laxatives:

Some people respond poorly to or do not tolerate fiber and may require laxatives other than bulk forming agents. Options include:

1. **Hyperosmolar laxatives**– these reduce water absorption from the colon, therefore there is more water in the stool to soften it and make passing easier.
 - a. Polyethylene glycol (Miralax®, Glycolax®)
 - b. Lactulose
 - c. Sorbitol
2. **Saline laxatives** – these act similarly to hyperosmolar laxatives by drawing water into the colon.
 - a. Magnesium hydroxide (Milk of Magnesia®)
 - b. Magnesium citrate (Evac-Q-Mag®)
3. **Stimulant laxatives** – because of their effectiveness, stimulant laxative can be overused. Excessive use may be associated with side effects including low potassium levels.
 - a. Senna (Ex-lax®, Fletcher's Castoria®, Senokot®)
 - b. Bisacodyl (Correctol®, Doxidan®, Dulcolax®)
4. **Newer treatments:**
 - Tegaserod (Zelnorm®) is a prescription medication that was taken off the market in March 2007 due to concerns about increased risks of heart attack or stroke.
 - Lubiprostone (Amitiza®) is a medication that increases intestinal fluid secretion. It is expensive and usually not covered by insurance companies.
5. **Stool softeners** – agents containing docusate (Colace®) were thought to increase the fluid content of the stool, making it easier to pass. Studies have shown that they are not very effective but are still used frequently.
6. **Natural products** – Senna tea is a natural laxative that is often used. Caffeine-containing beverages taken in the morning may be helpful for stimulating bowel action.
7. **Enemas** – tap water enemas or Fleets® enemas every three to four days are sometimes recommended. However, these can cause excessive absorption of water, potentially causing electrolyte abnormalities seen on blood tests.

Summary

There are a number of ways in which to treat chronic constipation. It is up to the primary care provider to decide when to treat and which method to use. There are studies showing that fiber and laxatives modestly increase bowel movement frequency. They also improve symptoms of constipation such as stool consistency and abdominal pain. There is no evidence proving that one type of laxative is better than another.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Self-study Questions Section X

Self-study Questions Section X Gastrointestinal System:

1. Name two life-style changes that can help reduce reflux:
a. _____ b. _____
 2. List two symptoms of GERD:
a. _____ b. _____
 3. What are the two most important components in our daily diets that help to decrease constipation?
a. _____ b. _____
 4. Some conditions cause excessive fluid losses and thus our need to take in fluids increases. List two conditions which can cause excessive fluid losses:
a. _____ b. _____
- 5 through 9, Matching
- | | |
|---|------------------------|
| 5. _____ a serious complication of GERD | a. Prilosec® |
| 6. _____ can cause relaxation of the lower esophageal sphincter | b. chronic cough |
| 7. _____ is used to treat GERD | c. Barrett's esophagus |
| 8. _____ occurs when normal cells lining the lower esophagus are replaced by a different cell type. | d. caffeine |
| 9. _____ is a symptom of GERD. | e. pulmonary fibrosis |
10. T F Nicotine contributes to GERD by causing dry mouth and throat.
 11. T F The universal sign of choking is hands clutched at the throat.
 12. T F If a person can still talk when choking; the airway is only partially blocked. You should encourage the person to cough to help clear the obstruction.
 13. T F If a person that is choking loses consciousness; gently lay him flat on his back on the floor and perform thrusts in the middle of the abdomen, just below the ribcage to clear the airway.
 14. T F Constipation is the most common digestive complaint among people.
 15. T F In general, an average person needs only about 1 quart of fluids daily.
 16. T F Medications that cause constipation include narcotics and antihistamines.
 17. Signs of choking include:
 - a. turning blue
 - b. laughing and talking
 - c. noisy breathing
 - d. all of the above
 - e. a and c

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Self-study Questions Section X -

18. Numerous factors contribute to reflux. Which of those listed below can contribute to an increase in reflux:
- a. eating too slowly
 - b. medications
 - c. being overweight
 - d. lying down after eating
 - e. all of the above
 - f. a, b, c
 - g. b, c, d
19. Factors that contribute to constipation include:
- a. high fiber diet
 - b. very low calorie diet
 - c. drinking a lot of water
 - d. running and playing
 - e. all of the above
20. Complications of chronic constipation include:
- a. hemorrhoids
 - b. abdominal pain
 - c. anal fissures
 - d. nausea and vomiting
 - e. all of the above
 - f. a, b, and d
21. Good sources of fiber include:
- a. cereal
 - b. white bread
 - c. prunes
 - d. broccoli
 - e. candy
 - f. all of the above
 - g. a, c, and d

XI. ASPIRATION AND ASPIRATION PNEUMONIA

Aspiration is a common event even in healthy individuals and usually causes no harm to that person. Aspiration is generally defined as the penetration of food, fluid or foreign bodies below the level of the vocal cords. Aspiration pneumonia refers to the lung consequences resulting from the abnormal entry of fluid, gastric secretions, food or other matter into the lungs. In order for aspiration to lead to pneumonia there are usually problems in two areas of a person's normal defense systems:

1. There is the lack of the usual defenses to protect the lower airways (such as the cough reflex) and inability to close off the trachea (the main passageway to the lungs) during swallowing.
2. The material aspirated causes (a) a direct toxic effect, (b) stimulates an inflammatory reaction from a large enough bacterial amount, or (c) obstructs the airways.

Aspiration pneumonia is the leading cause of death among people with developmental disabilities. It is important to understand how this happens and to learn ways in which to prevent it.

A. Predisposing conditions:

Conditions that make someone more susceptible to aspiration pneumonia include:

1. Reduced consciousness which decreases the ability to cough and the ability to close off the airway by the surrounding structures. Factors that reduce consciousness include:
 - Alcoholism
 - Seizures
 - Stroke
 - Head trauma
 - Anesthesia
 - Sedating drugs
 - sleeping pills such as Ambien® or Restoril®
 - antihistamines such as Benadryl®
 - antipsychotics such as Haldol®, Seroquel®, etc.
2. Dysphagia (problems with swallowing) from:
 - Narrowing of the esophagus (strictures)
 - Tumors
 - Surgery of the upper airways or esophagus
 - Gastric reflux.

3. Neurological disorders including Parkinson's disease and multiple sclerosis.
4. Miscellaneous conditions such as prolonged vomiting, large volume tube feedings, feeding via gastrostomy tubes (PEG), and the recumbent (lying down) position.

B. Classification:

There are three different clinical syndromes within the category of aspiration pneumonia. These three syndromes are (1) chemical pneumonitis (inflammation of lung tissue), (2) bacterial infection, and (3) airway obstruction. At times, these syndromes overlap.

1. Chemical pneumonitis:

This refers to aspiration of substances that are toxic to the lung but bacteria do not play a role. The most common cause of chemical pneumonitis is aspiration of gastric acid which can cause changes in the lung including:

- swelling and inflammation of lung tissue
- narrowing of the airways
- reduced oxygen exchange (inability for the oxygen breathed into the lung to pass into the tissues and blood stream)
- bleeding of lung tissue

Clinical features:

- Sudden onset of symptoms especially shortness of breath
- Low grade fever
- Bluish color to skin and mucus membranes such as lips.
- Low oxygen levels in the blood

Most individuals improve after this occurs but a small number develop a rapidly progressive course and die while others can develop a secondary bacterial pneumonia.

2. Bacterial infection (pneumonia):

The most common form of aspiration pneumonia is caused by bacteria that are normally found in the mouth or stomach.

Clinical features:

- Relatively slow onset of symptoms evolving over days to weeks
- Cough, fever, sputum production, shortness of breath

Treatment is primarily with antibiotics which would not be of use in an acute aspiration pneumonitis. Most patients respond within days to treatment.

3. Mechanical obstruction:

Aspiration of material (food, etc) and even fluids can cause airway obstruction. The most frequently observed form of aspiration of fluids is simple mechanical obstruction seen in drowning victims. The victim simply cannot clear the

airways of that amount of fluid. Other fluids can trigger an inflammatory reaction causing swelling of the airways and thus blocking air flow when trying to take a breath.

As far as solids, the most frequently seen items include peanuts, vegetable matter and teeth.

Large objects can cause obstruction of the larger airways causing sudden respiratory distress with inability to breathe, cyanosis (blue color to skin, mucous membranes) and inability to talk. This is sometimes referred to as “café coronary syndrome” as it mimics the symptoms of a heart attack and is often seen with aspiration of meat during restaurant dining. The Heimlich maneuver is used to try force the diaphragm up to dislodge the particle.

Aspiration of smaller particles causes less severe obstruction and individuals usually have a cough and sometimes wheezing. If a small section of lung is blocked off, a secondary bacterial infection may occur.

C. Prevention:

There are ways to help prevent the development of pneumonia even in persons who aspirate frequently. Many bacteria are present in the mouth, especially in the presence of poor oral hygiene or dental decay, and can overwhelm an already weakened immune system and cause pneumonia.

When someone has poor mouth hygiene, the normal mouth bacteria multiply faster. The bacteria can migrate to the back of the throat (larynx) and into the passageway to the lungs (trachea) and eventually into the lungs. Having a dry mouth also increases the problems with bacteria. One role of saliva and mucus is to fight bacteria through their immune properties. This is why **prevention of aspiration pneumonia must begin with good oral care.**

Steps to decrease the risk for aspiration and development of pneumonia:

1. Daily oral hygiene is of the utmost importance:

- Brush teeth with toothpaste after all meals and before bed
- Rinse mouth with antiseptic mouthwash
- Inspect the mouth frequently for sores, bleeding, or signs of infection
- Do not use sponges to swab the mouth as these are not at all effective in decreasing bacteria
- Lemon-glycerine swabs may moisten the mouth but do not clean it and the lemon may actually dry the mouth more.

2. **Encourage fluid intake** to keep the mouth moist.
3. **Encourage smoking cessation** as this will cause a dry mouth and contribute to an increase in bacteria.
4. **Decrease medications** that can cause dry mouth, decreased muscle tone, or lethargy. These include:
 - Diuretics
 - Antihistamines.
 - Antidepressants
 - Antipsychotics
5. **Positioning while eating or drinking** is very important:
 - A person should be sitting upright when taking any food, beverage, or medication. The head and trunk should be supported and aligned. Do not allow the person to slouch to one side, or eat while their head is turned to the side.
 - Following meals or snacks, remain sitting fully upright for at least 30 to 60 minutes.
6. **Eating too fast** or while in an agitated state will increase aspiration.
 - Assist the person in eating slowly.
 - Allow a long period of time for meals, no rushing.
 - Offer only small amounts of food and fluids at a time or make sure the individual takes small bites.
 - Allow enough time to clear the mouth between bites.
 - Offer sips of fluid between bites to help clear the mouth.
 - Keep the environment calm and relaxed.
7. **The texture** of the food may be important for some people.
 - Offer softer textures if the person is not able to chew well.
 - Adding thickening agents to fluids usually **does not** prevent aspiration and only compounds the problem by introducing the thickener into the lungs. These are not as easily cleared as plain water.
 - Food that is very sticky is often difficult to swallow. Provide textures that are easier to manage in the mouth.
8. **Reflux** of stomach contents (gastroesophageal reflux or GER) also causes aspiration. GER is the backward flow of stomach contents into the esophagus causing discomfort in the chest, vomiting, indigestion and even bleeding. The stomach contents can flow up the esophagus all the way to the trachea (passageway to the lungs) and spill into the lungs.

Ways to decrease reflux include:

- Provide smaller amounts of food more frequently as having a large amount of food in the stomach at one time can increase reflux.
- Slouching or bending over when there is food in the stomach causes the food to back up into the esophagus. Encourage good posture especially following meals.
- Tight fitting or constricting clothing can push the stomach contents up into the esophagus. Make sure clothing is loose and nonconstricting.
- Reflux often occurs while lying down, especially while asleep. Elevating the head of the bed will decrease reflux considerably.
- Certain foods increase reflux. These include alcohol, caffeine, fatty foods and chocolate.

D. Gastric feeding (PEG placement):

When a person has recurrent aspiration pneumonia, a discussion regarding the placement of a gastric feeding tube often follows especially if it is thought that the recurrent aspiration is from reflux of stomach contents into the lungs. Gastric feeding tubes (PEG) have a role in maintaining nutrition and hydration in someone with problems swallowing. The placement of a gastric feeding tube does not prevent aspiration pneumonia. In individuals with recurrent aspiration from gastric reflux, placement of a feeding tube farther down in the gut is indicated. This is referred to as **post-pyloric feeding** as the tube is placed past the pylorus which is the opening between the stomach and the small intestine. The tube is usually placed in the second portion of the small intestine (jejunum).

Advantages of gastric feeding:

- More physiological: this means that obtaining nutrition in this way is “normal” in that the food undergoes the same processing as it would if swallowed by mouth.
- Ease of placement: the placement of a PEG is relatively safe and can be accomplished easily by a gastroenterologist.
- Convenience: since the stomach can accommodate relatively large amounts of food at a time, gastric feeding can be accomplished in “bolus” feedings which do not disrupt the normal activities during the day any more than eating a meal would. Continuous feedings are used in persons whose stomachs empty very slowly and would not tolerate a large amount of food going in during a short time. However with continuous feedings, there is actually an increased rate of reflux of stomach contents.

Disadvantages of gastric feeding:

- Delayed stomach emptying: when the stomach empties very slowly, there may be symptoms of nausea and vomiting, bloating and fullness, and heartburn due to increased reflux.
- Reflux and aspiration: with gastric feeding, the opening between the stomach and the esophagus can become lax and allow food and fluids to more easily pass up into the esophagus.

E. Post-pyloric feeding (jejunostomy):

In individuals with significant reflux and aspiration, a PEG is often not the best way to provide nutrition. The tube is placed further down the intestine, after the pylorus which is the opening leading to the intestine from the stomach. Placing a tube farther down the intestine, into the jejunum is often done. This is referred to as a jejunostomy.

Advantages of post-pyloric feeding:

- May reduce GER and aspiration pneumonia
- Less bloating and distention of stomach and abdomen because there is continuous feeding.

Disadvantages of post-pyloric feeding:

- More difficult to place and more complications associated with it.
- The small intestine does not tolerate large volumes of food (bolus feedings) well, thus feeding is usually done continuously throughout the day. This can be less convenient and impact activities of that person.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Self-study Questions Section XI

Self-study Questions Section XI Aspiration/pneumonia

1. T F Aspirating while eating will always lead to pneumonia.
2. T F Gastroesophageal reflux (GER) can cause aspiration pneumonia.
3. T F Mouth (oral) hygiene is important in preventing pneumonia from aspiration.
4. T F Adding thickening agents to fluids will always help prevent aspiration.
5. T F Aspiration may occur with improper positioning.
6. List two ways to decrease the risk of aspiration:
 1. _____
 2. _____
7. Frequent aspiration of food, liquids or medications into the lungs can lead to:
 - a. aspiration pneumonia
 - b. death
 - c. lung damage
 - d. a and b only
 - e. all of the above
8. Medications that may interfere with swallowing or may cause GER include:
 - a. drugs that control seizures (Phenobarbital®, Dilantin®)
 - b. drugs that affect behavior (antipsychotic/psychotropic drugs)
 - c. drugs that affect muscle tone (muscle relaxant, tranquilizer)
 - d. all of the above
9. Conditions that make someone more susceptible to aspiration pneumonia include:
 - a. dysphagia (swallowing disorder)
 - b. stroke
 - c. diabetes
 - d. seizure disorder
 - e. all of the above
 - f. a and b
 - g. a, b, and d
10. For someone with recurrent aspiration, you would avoid:
 - a. thin liquids
 - b. alcohol
 - c. coffee
 - d. antihistamines
 - e. all of the above
 - f. a, b, and d
 - g. b, c, and d
- 11 through 16. Matching:
11. _____ is the leading cause of death among persons with developmental disabilities. a. coughing
12. _____ is the backward flow of stomach contents into the esophagus causing discomfort in the chest, vomiting, indigestion, and bleeding. b. aspiration pneumonia
13. _____ is defined as the penetration of food, fluid, or other foreign bodies below the vocal cords. c. chemical pneumonitis
14. _____ is a sign of aspiration. d. dysphagia
15. _____ is difficulty swallowing due to such things as narrowing of the esophagus. e. gastroesophageal reflux
16. _____ is aspiration of substances that are toxic to lung tissue f. aspiration

XII. ALLERGIES

A. ALLERGIC RHINITIS (SEASONAL ALLERGIES)

Rhinitis refers to inflammation of the nasal passages. Symptoms include sneezing, itching, nasal congestion, runny nose and post-nasal drip (the sensation of mucus draining down the back of the throat).

Brief episodes can be caused by viruses (the common cold). Chronic rhinitis is usually caused by allergies but can also be caused by the over use of certain drugs or some medical conditions.

1. Causes:

Allergic rhinitis, also known as hay fever, affects about 20% of people. The risk for developing allergies is higher if there is a family history of asthma and in people who already have asthma or eczema (allergic skin reactions). It is caused by a nasal reaction to small airborne particles called allergens (substances that provoke an allergic reaction). These particles can cause reactions in the lungs (asthma) and eyes.

The allergens cause activation of cells that produce inflammatory substances (including histamines), cause fluid to build up in the nasal tissues (congestion), itching, sneezing, and runny nose.

2. Symptoms:

Symptoms vary considerably from person to person and include:

- Nose: watery nasal discharge, blocked nasal passages, sneezing, nasal itching, post-nasal drip, loss of taste, and facial pressure or pain.
- Eyes: itching, redness, feelings of grittiness, swelling, blueness of the skin beneath the eyes.
- Throat: soreness, hoarseness, itching.
- Ears: congestion or popping of the ears, itching.
- Sleep: mouth breathing, frequent awakening, daytime fatigue and difficulty performing work.

3. Diagnosis:

Diagnosis is based on physical exam, symptoms, and sometimes the use of skin tests to identify specific allergens.

4. Treatment:

Treatment includes reducing exposure to the allergens and other triggers along with medications.

- a. **Nasal irrigation and saline sprays:** rinsing nasal passages with salt water (saline) is called nasal irrigation or nasal lavage. It can dramatically relieve symptoms for many people. It helps by rinsing out allergens and irritants from the nose.
- b. **Nasal glucocorticoids:** these are steroids delivered by a nasal spray and include Flonase® and Nasonex®. Symptoms may be relieved quickly with the use of these but usually they work slowly and are best used on a regular basis.
- c. **Antihistamines:** these relieve itching, sneezing and runny nose but do not relieve nasal congestion. Several oral medications are available including brompheniramine (Dimetapp allergy®), chlorpheniramine (Chlor-Trimeton®), and diphenhydramine (Benadryl®). These drugs often cause sedation. Less-sedating medications include Claritin®, Zyrtec® and Allegra®.
- d. **Decongestants:** such as pseudoephedrine or phenylephrine (Sudafed®, Actifed®) are often combined with antihistamines. These should be used for only short periods of time and do have side effects. They increase blood pressure and in men with enlarged prostates, can make it difficult to urinate.
- e. **Decongestant nasal sprays** (Afrin®, Neo-synephrine®) also decrease congestion but should only be used for 2 to 3 days at a time as they can cause a “rebound effect” which causes the nose to be congested constantly unless the nasal spray is used repeatedly. This condition called rhinitis medicamentosa is very difficult to treat.
- f. **Allergy shots:** are injections given to reduce a person’s sensitivity to allergens. The process of immunotherapy changes the person’s immune response to the allergens over time. These injections are given weekly for several months and then monthly. It is a long-term therapy and benefits may lessen when it is discontinued. It does carry a small risk of a severe allergic reaction occurring usually within thirty minutes of the injection.

B. ANAPHYLAXIS

Anaphylaxis is a severe, life-threatening allergic reaction. It is caused by contact with certain foods, medications, insects or latex. It can also be caused by physical exercise.

A person with a history of allergies or asthma has a higher chance of having an anaphylactic reaction. Once a person has an anaphylactic reaction, there is a higher risk of having another such reaction.

Allergies can develop at any time during a lifetime. Some individuals outgrow allergies to milk, soybeans, and eggs after childhood but allergies to peanuts and other nuts as well as shellfish are usually life long. Sensitivity to insect stings also can decrease over time or stop altogether especially among children.

The severity of the allergic reaction depends upon the amount of allergen an individual comes in contact with and how sensitive that person is to the allergen.

1. Symptoms:

The most distinctive symptoms of an anaphylactic reaction include:

- Swelling of the throat, lips, tongue, or around the eye
- Hives or welts
- Difficulty breathing or swallowing

Other common symptoms are:

- Generalized flushing, itching, redness of the skin
- Itching in the mouth or a metallic taste
- Nausea, vomiting, abdominal cramping or diarrhea
- An increase in heart rate, decreased blood pressure
- Paleness
- Weakness
- Anxiety
- Collapse or loss of consciousness

2. Treatment:

Avoidance of the allergen is the most important step to take to avoid a reaction. Individuals with food allergies must always inquire about the ingredients in food dishes. Individuals with allergies to insects must take basic precautions when outdoors as to footwear, clothing, and the use of perfumes in order to avoid contact.

3. Emergency Treatment:

Once an anaphylactic reaction has started, the best treatment is the immediate injection of epinephrine into the individual. This is generally effective in 10 to 15 minutes. This should always be followed by emergency medical attention.

There is not enough time to wait for an ambulance or paramedics to arrive for assistance once an allergic reaction has begun. It is impossible to predict how severe the reaction will be and death could occur if immediate attention is not received. Devices such as EpiPens® which are automatic injectors of epinephrine should always be available for use in such situations.

The EpiPen® contains epinephrine which works by reversing the effects of the allergen. It relaxes the muscles in the airway to ease breathing, it reverses swelling of tissues, and it stimulates the heart. However there are side effects associated with it such as a fast or pounding heart beat, nervousness, trembling, headache, dizziness, nausea and shortness of breath.

Anyone who is given epinephrine for an allergic reaction should be examined by a medical professional. Sometimes a second reaction to the allergen occurs after the initial allergic reaction appears to have resolved. These reactions usually occur within about 8 hours. This is why antihistamines are often prescribed for several days following the allergic reaction. Prednisone, which reduces inflammation, is also sometimes prescribed.

4. How to Use the EpiPen®

The epinephrine auto-injector (EpiPen®) should be used immediately when a person who is having an allergic reaction is having trouble breathing, feels tightness in the throat, or feels like passing out.

1. Have the person lie down if possible. Have someone call 911 if another person is available.
2. Unscrew the cap and remove the pen from the case. Be sure to keep fingers away from the ends to avoid getting stuck. The black end always contains the needle.
3. Pull off the gray safety-release cap and form a fist around the auto-injector. The black tip should be pointing down.
4. Quickly jab the black tip into the upper outer thigh, and hold in place for 10 seconds to allow all the medication to be injected. This can be done through clothing. Once all the medication is injected, the cartridge window will show red. Remove the pen.
5. Massage the injected area with your fingertips for about 10 seconds.
6. Call 911 (if not already done) and get the individual to the nearest emergency department.
7. Replace the pen in the case and take it to the hospital so that the needle can be disposed of safely.
8. If symptoms are not improving or are getting worse after five minutes, or if symptoms return before reaching the emergency department, a second dose may be given.

There is a website: www.epipen.com which has a video on how to use the EpiPen®.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Self-study Questions Section XII

Self-study Questions Section XII Allergies:

1. Name two symptoms of an anaphylactic reaction:
 - a. _____
 - b. _____
2. T F Once you have given epinephrine to a person suffering from anaphylaxis, there is no need to seek further medical evaluation or care.
3. T F Anaphylaxis is a severe, life-threatening allergic reaction.
4. T F It is ok to inject the contents of an EpiPen® through clothing.
5. Common allergens include:
 - a. nuts
 - b. latex
 - c. insect bites
 - d. all of the above
 - e. a and c only
6. Symptoms seen when someone is having an allergic or anaphylactic reaction include:
 - a. swelling of the lips and mouth
 - b. hives
 - c. difficulty breathing
 - d. all of the above
 - e. b and c only

HEALTH AND MEDICATION ADMINISTRATION MANUAL APPENDICES

- A₁. ANSWERS TO SELF-STUDY QUESTIONS**
- A₂. ANSWERS TO MAR AND MAR ERROR QUESTIONS**
- B. GLOSSARY**
- C. INSTRUCTIONS FOR SPECIFIC DOSAGE FORMS**
- D. FIBER TABLE**
- E. SAMPLE DOCUMENTATION FORMS**
 - 1. MAR**
 - 2. MEDICATION DISPOSITION FORM**
- F. MEDICATION TABLES**

APPENDIX A1

ANSWERS TO SELF-STUDY QUESTIONS

A. Section I & II Introduction and the role of the care giver in drug therapy.

(Page 6)

1. f. a, c, d
2. allergies or intolerances to medications
problems with swallowing or chewing
ability to cooperate with administration of the medication
behavioral problems that could affect what type of medication is given
such as suppositories
3. increased sedation
insomnia
behavioral changes
development of a rash
development of eating problems such as loss of appetite or increase in appetite
weight loss or gain
4. T

B. Section III. Medication Use

(Page: 20)

- | | |
|--|-------------------------|
| 1. T | 6. F |
| 2. F | 7. F |
| 3. F | 8. F |
| 4. F | 9. T |
| 5. F | |
| 10. OTC stands for _____(over the counter)_____drugs. | |
| 11. e. a, b, d | 15. d. all of the above |
| 12. b. 1 glassful (8 fluid ounces) | 16. f. all of the above |
| 13. h. d, f | 17. b. suppositories |
| 14. f. all of the above | |
| 18. extended, sustained or slow release, sustained action, delayed or time release, enteric coated | |

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to Self-study Questions -

C. Section IV. Administration of medications

(Page: 44)

- | | | | |
|-----|----------------------------|-----|---------------------|
| 1. | e. all of the above | 7. | e. all of the above |
| 2. | c. requires a prescription | 8. | e. b and c |
| 3. | e. all of the above | 9. | g. b and e |
| 4. | d. all of the above | 10. | a. bid |
| 5. | f. a and b | 11. | b. ac |
| 6. | d. all of the above | 12. | c. hs |
| 13. | c | 18. | d |
| 14. | f | 19. | i |
| 15. | g | 20. | b |
| 16. | a | 21. | e |
| 17. | h | | |
| 22. | f | 26. | a |
| 23. | h | 27. | b |
| 24. | d | 28. | e |
| 25. | g | 29. | c |
| 30. | c | 33. | a |
| 31. | d | 34. | b |
| 32. | f | 35. | e |
| 36. | d | 39. | e |
| 37. | f | 40. | b |
| 38. | a | 41. | c |
| 42. | T | 49. | F |
| 43. | F | 50. | T |
| 44. | T | 51. | F |
| 45. | T | 52. | F |
| 46. | F | 53. | T |
| 47. | T | 54. | F |
| 48. | F | 55. | F |

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to Self-study Questions -

C. Section IV. Administration of medications (continued)

56. The right person
The right medication
The right dose
The right route
The right time
The right position
The right medium/texture/consistency

D. Section VI. Categories of medications

(Page 84)

- | | | | |
|-----|-------------------|-----|---|
| 1. | T | 5. | F |
| 2. | F | 6. | T |
| 3. | F | 7. | T |
| 4. | T | | |
| 8. | e | 12. | c |
| 9. | h | 13. | b |
| 10. | f | 14. | d |
| 11. | g | 15. | a |
| 16. | f. a, b, and c | | |
| 17. | h. a, b, c, and e | | |

E. Section VII. Seizure disorders

(Page 97)

- | | | | |
|-----|---|-----|-----------------|
| 1. | d. a and b | 4. | g. a, c, and e |
| 2. | e. all of the above | 5. | f. a, b, d only |
| 3. | e. all of the above | | |
| 6. | b. you should get him out as fast as possible | | |
| 7. | T | 10. | T |
| 8. | F | 11. | F |
| 9. | F | | |
| 12. | F | 15. | T |
| 13. | T | 16. | T |
| 14. | F | 17. | T |

E. Section VII. Seizure disorders (continued)

18. Facial grimacing, gesturing, swallowing, chewing, lip smacking
Snapping fingers, repeating words/phrases, running, undressing
19. Unusual behaviors, feelings or sensations
20. Breathing, skin tone, muscles tensed, fall, loss of bowel or bladder control
21. Was person drowsy or confused?
Did person have a headache or physical injuries?
Can person describe an aura prior to the seizure?
Does person remember anything that happened prior or during the seizure?

F. Section VIII. Strokes and TIA's

(Page 103)

1. c
2. a
3. b
4. Age over 40 years
Heart disease such as atrial fibrillation (clots form more easily in the heart)
Narrowing of the carotid arteries.
High blood pressure
Smoking
Diabetes
Elevated cholesterol levels
Illegal drug use or heavy alcohol use
Sedentary lifestyle and lack of exercise
Obesity
History of blood clots
Use of warfarin or other anticoagulant medication
5. Face – sudden weakness or numbness of the face; blurred double,
or decreased vision
Arm – Sudden weakness or numbness of one or both arms
Speech – difficulty speaking, slurred or garbled speech or inability to speak
Severe headache
6. T
7. F
8. T
9. T
10. F
11. T

G. Section IX. Diabetes mellitus

(Page 109)

1. e. all of the above
2. e. a, c, d
3. g. a, d, e
4. f. b, c, d
5. d. all of the above

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to Self-study Questions -

I. Section XI. Aspiration and aspiration pneumonia

(Page 126)

- | | |
|---|--------------------|
| 1. F | 4. F |
| 2. T | 5. T |
| 3. T | |
| 6. Oral hygiene: brush teeth, mouthwash, etc
Increase fluid intake, encourage smoking cessation,
Decrease medications that cause dry mouth,
Positioning: upright, no slouching, remain upright for 30 to 60 min.
Eat slow, no rushing, small amounts, decrease agitation, allow adequate time.
Food texture: softer, easier to chew, not sticky
Decrease reflux: position, small amounts of food, not tight fitting clothing,
Stay upright after eating, elevate head of bed | |
| 7. e. all of the above | 9. g. a, b, d |
| 8. d. all of the above | 10. g. b, c, and d |
| 11. b | 14. a |
| 12. e | 15. d |
| 13. f | 16. c |

J. Section XII. Allergies

(Page 131)

- Swelling of the throat, lips, tongue, or around eyes
Hives or welts
Difficulty breathing or swallowing
Generalized flushing, itching, redness of the skin
Itching in the mouth or a metallic taste
Nausea, vomiting, abdominal cramping or diarrhea
An increase in heart rate, fast pulse
Paleness and decreased (low) blood pressure
Weakness or collapse
Anxiety
Loss of consciousness
- F
- T
- T
- d. all of the above
- d. all of the above

APPENDIX A2

ANSWERS TO MAR AND MAR ERROR QUESTIONS

Practice MAR question # 1 Medication administration record (MAR)

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12	
Amoxil 250 mg, two capsules by mouth as soon as possible then:	start														
	2/5/09														
	8pm		X	X	X	X		X	X	X	X	X	X	X	
Amoxil 250 mg, one capsule by mouth three times daily for 10 days	start	7am	X	X	X	X	X								
	2/6/09	2pm	X	X	X	X	X								
		8pm	X	X	X	X	X								
Robitussin AC cough medicine 10 mg/5 ml Give 20 mg (10 ml) four times daily as needed for cough for one week	start	date											X	X	
		time											X	X	
		initial											X	X	
	2/5/09	date											X	X	
		time											X	X	
		initial											X	X	
		date											X	X	
		time											X	X	
		initial											X	X	
		date											X	X	
		time											X	X	
		initial											X	X	
Diagnosis: respiratory tract infection															
Allergies: sulfa								IN	name			IN	name		
Name: Joey King		Physician: Jill Parker						NR	Nan Roberts			TJ	Tim Jones		
Date of Birth: 7/12/86		Phone number: 442-4321						cp	Caroline Peters						

When a medication is given “prn”, you make out the MAR slightly differently. There will generally be a separate page for prn medications but for this exercise the forms were combined into one MAR. Instead of using the days of the month as listed along the top of the page, you would write in the date/time/initial each time the medication is given since it may not be given every day or may be given several times in one day.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Answers to MAR and MAR Error Questions

An example of this would look as follows:

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Amoxil 250 mg, one capsule by mouth three times daily for 10 days	start	7am	X	X	X	X	X							
	2/6/09	2pm	X	X	X	X	X							
		8pm	X	X	X	X	X							
Robitussin AC cough medicine 10 mg/5 ml Give 20 mg (10 ml) four times daily as needed for cough for one week	start	date	2/5		2/7								X	X
		time	8pm		8am								X	X
		initial	NR		TJ								X	X
	2/5/09	date			2/7								X	X
		time			2pm								X	X
		initial			TJ								X	X
		date											X	X
		time											X	X
		initial											X	X
Diagnosis: respiratory tract infection														
Allergies: sulfa								IN	name		IN	name		
Name: Joey King			Physician: Jill Parker					NR	Nan Roberts		TJ	Tim Jones		
Date of Birth: 7/12/86			Phone number: 442-4321					cp	Caroline Peters					

Practice MAR question # 2 Medication administration record (MAR)

Medication	April	HR	1	2	3	4	5	6	7	8	9	10	11	12
Sinemet CR 25/100 mg, one per mouth four times daily	start	8 am	X	X										
	4/2/09	12 noon	X	X										
		4 pm	X											
		8 pm	X											
Cipro 250 mg, one per mouth twice daily for five days	start	8 am	X	X						X	X	X	X	X
	4/2/09													
		8 pm	X						X	X	X	X	X	X
Diagnosis: Parkinson's, UTI														
Allergies: Sulfa								IN	Name		IN	Name		
Name: Bill Jones			Physician: Paul Smith					NR	Nan Roberts		TJ	Tim Jones		
Date of Birth: 12/2/48			Phone number: 406-442-4321					cp	Caroline Peters					

This is another case when "5 days" actually extends into the 6th day so that the client is able to get all 10 doses of the antibiotic.

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Answers to MAR and MAR Error Questions

Practice MAR question # 3 **Medication administration record (MAR)**

Medication	April	HR	1	2	3	4	5	6	7	8	9	10	11	12
Coumadin 1 mg, 2 tabs by mouth daily	start													
	12/2/08	2pm	TY	T Y	T Y	RJ	RJ	RJ	X	X	X	X	X	X
Coumadin 1 mg: take one tab by mouth for 1 day starting April 7 th , then	start													
	4/7/09	2pm	X	X	X	X	X	X		X	X		X	X
Coumadin 1 mg, 2 tabs by mouth for 2 days, then repeat sequence	start													
	4/8/09	2pm	X	X	X	X	X	X	X			X		
Diagnosis: atrial fibrillation														
Allergies:			IN	Name		IN	Name							
Name: Fran Simmons DOB: 6/4/64			Physician: Paul Smith Phone # 442-4321		RJ	Rob Jones		TY	Troy Yates					
			cp	Caroline Peters										

Practice MAR question # 4 **Medication administration record (MAR)**

Medication	June	HR	1	2	3	4	5	6	7	8	9	10	11	12
Coumadin 1 mg, take 2 tabs by mouth every day except:	start													
	6/2/09	2pm	X				X				X			
Coumadin 1 mg, take 1 tab by mouth every fourth day	start													
	6/1/09	2pm		X	X	X		X	X	X		X	X	X
Diagnosis: atrial fibrillation														
Allergies:			IN	Name		IN	Name							
Name: Fran Simmons Date of Birth: 6/4/64			Physician: Paul Smith Phone number: 406-442-4321		RJ	Rob Jones		TY	Troy Yates					
			cp	Caroline Peters										

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Answers to MAR and MAR Error Questions

Practice MAR question # 5 **Medication administration record (MAR)**

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12	
Coreg 3.125 mg: one tablet by mouth daily for one week, then:	start														
	2/4/09	8am	X	X	X								X	X	
		8pm	X	X	X								X	X	
Coreg 3.125 mg: take two tablets by mouth twice daily	start														
	2/11/09	8am	X	X	X	X	X	X	X	X	X	X			
		8pm	X	X	X	X	X	X	X	X	X	X			
Lasix 40 mg, two tabs by mouth every morning	start														
	1/2/09	8am	ty	ty	ty										
Lasix 40 mg, one tab by mouth at 2 pm daily	start														
	2/4/09	2pm	X	X	X										
Combivent inhaler; inhale two puffs four times daily	start	8am	X	X	X										
	2/3/09	12 pm	X	X	X										
		4pm	X	X	X										
		8pm	X	X											
Clindamycin 300 mg, take two capsules by mouth one hour prior to procedure on 2/10	start														
	2/10/09	1pm	X	X	X	X	X	X	X	X	X		X	X	
Diagnosis: Pulmonary hypertension, prosthetic heart valve															
Allergies: Shellfish, Penicillin						IN	Name			IN	Name				
Name: Carol Frasier DOB: 9/11/49		Physician: Carla Herman Phone: 442-4321				ty	Troy Yates								

Since you will continue to give Lasix 40 mg, 2 tabs every morning as was previously ordered, you do not have to rewrite this part of the order. All you need to do is add a row for the second (afternoon) dose of Lasix which starts on 2/4.

MAR error question # 1

Brian was seen by Dr. Hartman late in the afternoon on 2/5/09. His Coumadin was increased from 2.5 mg daily to 3 mg daily. He was also started on Digoxin. Brian has atrial fibrillation. He is allergic to Penicillin. You come into work on the morning of 2/8/09 and prepare to help administer meds. You have some concerns about what it shows on the MAR.

There are 7+ errors in the MAR: number them on the MAR (after first making a working copy of these two pages) and list them:

Davis and Hartman Medical Group, PLLC 1011 Jackson Helena, MT 59604 406-442-6779	
Name: <u>Brian Hunt</u>	Date: <u>February 5, 2009</u>
DOB: <u>6/7/45</u>	
Rx:	
<i>Digoxin 0.5 mg # 30</i>	
<i>Sig: one tab p.o. q.d. Refill x 1 year</i>	
<i>Coumadin 3 mg # 30</i>	
<i>Sig: one tablet p.o. q.d. starting 2/7 Refill x 1 year</i>	
Signed: <u>Jim Hartman, MD</u> Jim Hartman, MD	

1. Med stopped on the wrong date – should get doses through 2/6.
2. a. wrong start date
b. did not indicate starting date on MAR as written on script
c. wrong dose of drug given on 2/6
3. Wrong dose written on MAR (dose is 0.5 not 0.05)
4. a. wrong instructions written on MAR – script states qd (daily), MAR states qid (4 times daily) QID should have been written out fully.
b. did not write out by mouth instead of po
c. extra doses given on 2/6 and 2/7. The prescription is not clear as to whether to give the first dose in the morning of 2/5 or start it on 2/6. You would need to clarify this with the physician.
5. Wrong allergy listed, the information on the client states he has a penicillin allergy
6. Wrong name on MAR
7. Wrong birth date on MAR

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to MAR and MAR Error Questions -

MAR error question # 1 **Medication administration record (MAR)**

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11
Coumadin 2.5 mg by mouth every day	start												
	6/5/07	2pm	NR	NR	NR	NR	cp	X 1	X	X	X	X	X
Coumadin 3 mg by mouth every day	start												
	2/5/09 2	2pm	X	X	X	X	X	cp 2	cp				
Digoxin 0.05 3 mg po qid 4	start	7am	X	X	X	X	X	cp	cp				
	2/6/09	11am 4	X	X	X	X	X	cp 4	cp 4				
		3pm 4	X	X	X	X	X	cp 4	cp 4				
		8pm 4	X	X	X	X	cp 4	cp 4	cp 4				
Diagnosis: atrial fibrillation													
Allergies: sulfa 5						IN	Name			IN	Name		
Name: Brian Hunter 6 Date of Birth: 6/3/55 7		Physician: Jim Hartman Phone number: 442-6779				NR	Nan Roberts			TJ	Tim Jones		
						cp	Caroline Peters			VL	Vicki Lund		

8. This illustrates the importance of looking at all the information on the prescription and on the MAR whenever you help administer medications. Since this client was given extra doses of Digoxin for two days, you would immediately notify the physician (or at least the pharmacist or nurse) to report this. You will need information as to what things you should watch for in observing the client. There will also need to be medication error (incident) reports completed for every time that a medication was given incorrectly.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to MAR and MAR Error Questions -

**Following is how the MAR should look: MAR error question # 1
Medication administration record (MAR)**

Medication	FEB	HR	1	2	3	4	5	6	7	8	9	10	11	12
Coumadin 2.5 mg per mouth every day	start													
	6/5/07	2pm	NR	NR	NR	NR	cp	cp	X	X	X	X	X	X
Coumadin 3 mg per mouth every day	start													
	2/7/09	2pm	X	X	X	X	X	X	cp					
Digoxin 0.5 mg by mouth daily	start	7am	X	X	X	X	X	cp	cp					
	2/6/09													
Diagnosis: atrial fibrillation														
Allergies: penicillin					IN	Name		IN	Name					
Name: Brian Hunt		Physician: Jim Hartman			NR	Nan Roberts		TJ	Tim Jones					
Date of Birth: 6/7/45		Phone number: 442-6779			cp	Caroline Peters		VL	Vicki Lund					

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to MAR and MAR Error Questions -

MAR error question: # 2

Mike has a sore on his leg that has become infected. He was seen by Dr. Hartman on the afternoon of March 3 and medications were prescribed. Mike is allergic to sulfa. You are supposed to help administer meds to Mike on the morning of March 6th. As you look over the MAR, you notice some problems.

Here is the prescription and the MAR that was filled out.

There are at least 5+ errors in the MAR (some errors have different aspects): number them on the MAR (after first making a working copy of these two pages) and list them:

Davis and Hartman Medical Group, PLLC

1011 Jackson Helena, MT 59604

406-442-6779

Name: Mike Peters Date: March 3, 2009

Date of birth: 4/6/73

Rx:

Keflex 250 mg

23

Sig: two caps po immediately, then one cap po tid until gone

Bactroban ointment

Disp: one medium tube

Sig; apply to wound bid x 7 days

Signed: Jim Hartman, MD

Jim Hartman, MD

1. Did not put down if to be given orally
2. Wrong instructions – should be one capsule po three times daily plus should have another line for the one time dose of 2 capsules on the evening of 3/3
3. Wrong start date (script states give first dose immediately which would have been that night – 3/3.)
4. Missed dose
5. Stopped too soon: the prescription was written for 23 capsules therefore after giving 2 capsules the first night, 21 capsules are left over. 21/3 capsules each day = 7 days. The med would have been given through 3/10.
6. Wrong start date for Bactroban, should have been started the evening of 3/3. Day one is 3/3 thus one week would go through 3/9.
7. No diagnosis

HEALTH AND MEDICATION ADMINISTRATION MANUAL
Answers to MAR and MAR Error Questions

MAR error question: # 2

Medication administration record (MAR)

Medication	Mar	HR	1	2	3	4	5	6	7	8	9	10	11	12	13
Keflex 250 mg 2 capsules 1 tid until gone 2	start	7am	X	X	X	cp	cp			X	X	X	X	X	X
	3/4/09	2pm	X	X	X	VL	VL			X	X	X	X	X	X
		8pm	X	X	X 3	4	VL			X 5	X 5	X 5	X	X	X
Bactroban ointment apply to wound twice daily for 7 days	start	8am	X	X	X	cp	cp						X	X	X
	3/4/09														
		8pm	X	X	X 6	VL	VL						X	X	X
Diagnosis: 7															
Allergies: sulfa						IN	Name			IN	Name				
Name: Mike Peters			Physician: Jim Hartman			NR	Nan Roberts								
Date of Birth: 4/6/73			Phone #: 442-6779			cp	Caroline Peters			VL	Vicki Lund				

Following is how the MAR should look: MAR error question: # 2

Medication	March	HR	1	2	3	4	5	6	7	8	9	10	11	12	13
Keflex 250 mg 2 capsules by mouth now, then	start	8pm	X	X	cp	X	X	X	X	X	X	X	X	X	X
	3/3/09														
Keflex 250 mg, one capsule by mouth three times daily until gone	start	7 am	X	X	X	cp	cp						X	X	X
	3/4/09	2 pm	X	X	X	cp	cp						X	X	X
		8 pm	X	X	X	VL	VL						X	X	X
Bactroban ointment apply to wound twice daily for 7 days	start	8am	X	X	X	cp	cp					X	X	X	X
	3/3/09														
		8pm	X	X	VL	VL	VL					X	X	X	X
Diagnosis: infected sore on leg,															
Allergies: sulfa						IN	Name			IN	Name				
Name: Mike Peters			Physician: Jim Hartman			NR	Nan Roberts								
Date of Birth: 4/6/73			Phone # 442-6779			cp	Caroline Peters			VL	Vicki Lund				

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to MAR and MAR Error Questions

MAR error question # 3

Mary Hunter has epilepsy, anxiety, and severe constipation. She has no allergies. She just had an appointment with Dr. Hartman and was prescribed a new medication for constipation. She was also scheduled for dental work on March 5 and requires Ativan prior to the appointment to help her relax. You came in to work on March 4th and are about to help with medication administration. You notice that some things are not quite right on the MAR. Here is the prescription and the MAR that was filled out.

Davis and Hartman Medical Group, PLLC
1011 Jackson Helena, MT 59604
406-442-6779

Name: Mary Hunter Date: March 2, 2009
Date of birth: 3/7/65

Rx:

Ativan 1 mg

2

Sig: give two tablets po on the morning of March 5, 2009

Lactulose syrup 10 g/15 ml

Disp: One months supply

Sig: give 20 g po every morning starting 3/3/09. Refill x 1 year

Signed: Jim Hartman, MD
Jim Hartman, MD

1. Prescription states give two tabs on one day
2. a. prescription states give on the morning of 3/5/09 therefore
b. start date incorrect
3. a. should have X's under March 3rd and 4th as both pills should have been given on the 5th.
4. Should have X's here as medication stopped after 3/5 dose
5. Wrong dose: script states 20 g which would be 30 ml (10 g/15 ml)
6. No diagnosis written down
7. Wrong – she has no allergies
8. Wrong birth date

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Answers to MAR and MAR Error Questions -

Medication administration record (MAR)

Medication	March	HR	1	2	3	4	5	6	7	8	9	10
Ativan 1 mg give 1 tab 1 by mouth starting 3/3/09 2	start											
	3/3/09 2	8am	X	X	pp 3	3		4	4	4	4	4
Lactulose syrup 10g/15ml Give 15 ml 5 by mouth every morning starting 3/3/09	start	8am	X	X	pp							
	3/3/09											
	stop											
Diagnosis: 6												
Allergies: sulfa 7					IN	Name		IN	Name			
Name: Mary Hunter		Physician: Jim Hartman			PP	Polly Primm		RT	Rick Thomas			
Date of Birth: 3/3/65 8		Phone number: 442 6779			hh	Holly Hunt		LD	Larry Devine			

Following is how the MAR should look: MAR error question: # 3

Medication	March	HR	1	2	3	4	5	6	7	8	9	10
Ativan 1 mg give 2 tabs by mouth on the morning of 3/5/09	start											
	3/5/09	8am	X	X	X	X		X	X	X	X	X
Lactulose syrup 10g/15ml Give 30 ml by mouth every morning starting 3/3/09	start	8am	X	X	pp							
	3/3/09											
Diagnosis: epilepsy, anxiety, constipation												
Allergies: none					IN	Name		IN	Name			
Name: Mary Hunter		Physician: Jim Hartman			PP	Polly Primm		RT	Rick Thomas			
Date of Birth: 3/7/65		Phone number: 442 6779			hh	Holly Hunt		LD	Larry Devine			

APPENDIX B

GLOSSARY

Absence Attack (Minor Motor or Pettit Mal Seizure): a type of generalized seizure characterized by a sudden, brief clouding of consciousness without falling or muscle manifestations.

Agonist: term used to describe a type of drug that binds and alters activity of a cell receptor. It may increase or decrease the receptor's activity.

Akathisia: a common side effect associated with the use of anti-psychotic medications. Characterized by the sense of restlessness often accompanied by excessive, usually repetitive, movements such as pacing, foot tapping, or rocking. There is a feeling of inability to sit still as well as anxiety, nervousness.

Anticonvulsant (anti-epileptic): a drug used to prevent or reduce the frequency of seizures.

Aqueous solution: a substance dissolved in water.

Assist: to give support or aid in the self-administration of medication.

Ataxia: loss of ability to coordinate muscular movement. In general, it means unsteady movements and staggering walk.

Aura: a peculiar feeling, smell, sound, taste, or other sensation that frequently precedes the onset of a partial complex seizure.

Automatism: repetitive, rhythmic, purposeful movement (such as lip-smacking, swallowing, walking aimlessly, or picking at one's clothing) that sometimes accompanies a partial complex seizure.

Benzodiazepine: commonly prescribed class of sedative hypnotic psychoactive drugs used for anxiety, sedation, muscle relaxation, and seizures.

Black box warning: a warning mandated by the US Food and Drug Administration to appear on the full prescribing information of a prescription medication. These warnings alert the doctors and pharmacists to serious matters regarding the use of the given medication.

Bradykinesia: abnormal slowness of movement such as a shuffling walk. It is the main symptom of Parkinson's disease.

Brand Name (Trade Name): the specific name of a particular product (such as a drug) that can be used only by the company that registers the name.

Bronchodilators: a common medication used in the treatment of lung disorders, especially COPD (chronic obstructive pulmonary disease). It works by relaxing and expanding (dilating) the airways making it easier to breath.

Capsule: a structure in which something is enclosed such as a hard or soft, soluble container of a suitable substance, often containing gelatin, for enclosing a dose of a medicine.

Cardiomyopathy: which means “heart muscle disease”, is the deterioration of the function of the heart muscle for any reason.

Central Nervous System: The brain and spinal column; the system that carries the impulses (messages) that allow the body to function.

Cognitive: pertaining to the mental processes of comprehension, judgment, memory, or reasoning.

Clonic: the phase in a generalized seizure in which the muscles alternately tense and relax.

Controlled Substance: substance under the Federal classification system that drugs found to be habit forming are assigned a schedule from II-V, depending on their potential for abuse.

Delirium: mental confusion which is usually temporary. Disordered speech and hallucinations are often present.

Delusions: false beliefs that are firmly held.

Delusions of grandeur: the false belief that one is famous or publicly important or is a god.

Paranoid delusions: believing that one is being followed, spied upon, secretly listened to, etc.

Dementia: mental deterioration due to organic causes such as peripheral vascular disease (narrowing of blood vessels so less blood gets to brain tissue).

Depression: an extreme mood of sadness with physical symptoms such as loss of appetite and sleep.

Disorientation: loss of one’s sense of direction, position, or relationship with one’s surroundings. A temporary or permanent state of confusion regarding place, time, or personal identity.

Dose: specific quantity of a drug.

Dyspepsia: indigestion; characterized by pain in the upper abdomen, abdominal fullness, and feeling full earlier than expected when eating.

Dysphoric: feeling unwell or unhappy.

Dystonia: muscle spasms.

Elixir: sweetened preparation of a drug that contains alcohol.

Embolic stroke: A type of stroke that occurs when a blood clot breaks off and is trapped inside an artery causing the interruption of blood flow to that section of the brain.

Emulsion: a mixture of oil and water.

Epilepsy (Seizure Disorder): a condition in which a person may continue to have seizures throughout his/her life (unless controlled by medications). The cause may or may not be known.

Ethics: Science of moral values, a moral code of conduct that respects confidentiality and privacy.

Extract: a solution or powder obtained by removing and concentrating drug ingredients from a plant or animal.

Extrapyramidal side effects: group of symptoms that can occur in persons taking antipsychotic medications. Side effects include: tremor, akathisia, slurred speech, dystonia, bradykinesia, muscle rigidity.

Generic Name: the name of the active ingredient in a drug.

Hallucinations: the perception of a nonexistent object or event. Hallucinations involve hearing, seeing, feeling, smelling, and even tasting things that are not real. Auditory hallucinations (hearing voices or other sounds that are not present) are the most common type.

Hemorrhagic stroke: the sudden onset of neurological symptoms as a result of bleeding inside the brain. Commonly caused by a ruptured blood vessel (aneurysm).

Idiopathic: of unknown cause.

Initial dose: first dose of a drug.

Insomnia: a symptom of a sleeping disorder characterized by difficulty falling asleep or staying asleep.

Interaction: two or more drugs reacting together to change their intended effects on the body.

Lethal dose: dose likely to cause death.

Lethargy: a state of sluggish inactivity with a lack of interest in doing anything.

Loading dose: large dose given at the beginning of treatment to quickly elevate the level of the drug in the blood.

Maintenance dose: dose of a drug given regularly over a period of time to keep the drug level at a steady state.

Maximum dose: largest amount of a drug that can be safely taken.

Minimum dose: smallest amount of a drug that will produce a physiologic effect on a person.

Neurotransmitter: chemical substance that transmits nerve impulses or signals across the space between nerve cells.

Orthostatic hypotension: a condition that causes a person's blood pressure to drop when they rise from a seated or lying position to standing. This may cause blurred vision, dizziness or faintness, and may lead to fainting if severe.

Overdose: dose that is too large for the person's age, weight, and physical condition.

Parkinson's disease: a degenerative disease of the brain that impairs motor skills, speech, and other functions. It is characterized by muscle rigidity, tremor, a slowing of physical movement, and can lead to a loss of movement.

Paroxysmal: occurring in sudden recurrences of symptoms such as sudden spasms or seizures.

PCP (Primary Care Physician): the main physician, usually an internist or family practitioner that a person sees for their general medical care.

Polypharmacy: taking more than one medication to treat the same condition or for the same reason.

Prompt: assistance a teacher can give when a person cannot do the tasks on his/her own such as verbal instructions, gestures, modeling, and physical guidance.

Reinforcer: any object or event that follows a behavior and increases the future occurrence of that behavior.

Schizophrenia: a severe mental disorder characterized by delusions, hallucinations, incoherence and physical agitation. It is classified as a "thought" disorder while bipolar disorder is a "mood" disorder.

Seizure Disorder: (Epilepsy): a condition in which a person may continue to have seizures throughout his/her life (unless controlled by medications). The cause may or may not be known.

Seizure: uncontrolled and abnormal electrical discharges from brain cells that temporarily disrupt body functioning.

Self-administration: the taking of medication by a person without outside help.

Side Effects: an unintended effect of a drug.

Special Side Effect: an unintended drug effect that is characteristic of a specific medication.

Supervise: to critically watch and direct someone in the self-administration of medication or other activities.

Suppository: a medication delivery system adapted for insertion into a body orifice that is solid at room temperature but melts or dissolves at body temperature.

Synergistic effect: action of two drugs working together for an increased effect.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Glossary -

Tablet: a solid dosage form of various size, weight and shape, which may be molded or compressed and which contains a medicinal substance in pure or diluted form.

Tardive Dyskinesia: late onset of a movement disorder which includes akathisia, dystonia, etc. Often seen after long-term treatment with antipsychotic medications.

Thrombotic stroke: a type of stroke caused by the interruption of blood flow to a part of the brain due to the slow formation of a blood clot inside the artery.

Tolerance: resistance to a drug in which larger and larger doses are required to produce the desired effect.

Tonic: the phase in a generalized seizure in which the muscles are flexed (tensed).

Toxic Side Effect: an unintended consequence which results from an excessive dosage of a drug.

Trade Name (Brand Name): the specific name of a particular product (such as a drug) that can be used only by the company that registers the name.

Transcription: the process of transferring a physician's order from the order sheet to the Medication Administration Record.

Tremulousness: characterized by tremor or pertaining to tremors or involuntary muscle contractions. Also: shaking, trembling, and quivering.

APPENDIX C

Instructions for Specific Dosage Forms

A. ADMINISTERING ORAL MEDICATIONS

Equipment

- ηMedication tray, as applicable
- ηMedication ordered
- ηAny measuring utensils necessary
- ηMAR
- ηMedicine cup

1. Handle tablets and capsules in such a way that the fingers do not come in contact with them. Drop the tablet into a medicine cup directly from the bottle or if using unit dose packaging, press the tablet out of the blister pack into a medicine cup.
2. When preparing liquid medications, be sure to read the label directions first, then:
 - Check to see that the cap of the bottle is on securely
 - Shake the bottle to mix its contents thoroughly if the medication is in the form of a suspension or emulsion.
 - Remove the cap and place it top side down on the table
 - When pouring liquid medications, hold the bottle with the label in the palm of the hand to avoid soiling it.
 - Pour the medication holding the graduated medicine cup at eye level.
 - Wipe the lip of the bottle with a moist piece of clean paper towel or gauze before recapping it. Recap it securely.
3. Many persons have difficulty in swallowing medications. The following techniques may be helpful in gaining that person's cooperation as well as enabling the person to take all the medications. However if the person has a specific swallowing and positioning plan, it must be followed.
 - Have the person in a sitting position. If the person is in bed, elevate the head of the bed.
 - If several tablets or capsules must be taken, offer them one at a time.
 - Give sips of water before administering medication and after each tablet. Use a drinking straw if necessary.
 - Allow the person to rest a moment or two after each tablet. This often quiets the cough reflex. Allowing sufficient time for the person to take the medication and the water is very important for success.
 - Give liquid medication slowly: 1 to 2 tsp (5 to 10 ml) should be given in several sips. Follow with sips of water.
 - A tablet or capsule may be swallowed fairly easily if given with such things as applesauce or jelly if these foods are permitted for that person.
 - If the person has difficulty swallowing tablets or capsules, consult the physician to see if the medication can be crushed or taken in a different form.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Instructions for Specific Dosage Forms -

Procedure:

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered. Also check for texture and/or position when indicated.
2. Wash hands, using proper technique.
3. Check the medicine listed on the MAR with the label on the medicine container. This label should be checked three times:
 - When taken from the person's supply
 - When removed from the container
 - When returned to the person's supply
4. When preparing solid forms (tablets, capsules, etc) place the number of tablets in the medicine cup. If a scored tablet is to be broken, the pharmacy should ideally break it.
5. Take the medication to the person and explain what you are going to do. Be sure that you correctly identify the person prior to administering the medication.
6. Note any unusual reactions or symptoms prior to or following administration of any oral medication. Report them to the physician immediately and then chart those observations.
7. Remain with the person until the medication has been swallowed.
8. Clean and replace equipment. Wash hands.
9. Chart the medication administered.
10. Observe the person within 20 minutes (or a prescribed length of time) to check for response to the medication or any side effects.

Lozenges, Sublingual or Buccal Medications

- These medications are meant to be dissolved in the mouth, not swallowed.
- Be sure that the person understands the medication is not to be swallowed.
- If given with several other medications, give last.
- Do not take with water (check with recommendations). Wait for 10 to 15 minutes before eating or drinking.
- If you must assist with proper placement of the medication in the mouth, be sure to wear clean disposable gloves.
- Sublingual is dissolved under the tongue.
- Buccal is dissolved in the back pocket of the mouth between the gums and cheek.
- Lozenges can be sucked like hard candy but **Do Not Chew Lozenges.**

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

- a. Medication, method of administration (oral sublingual, etc) and dosage given.
- b. The time of administration.
- c. The signature of the person administering the medication or initials if a complete signature and title is recorded on the MAR.

B. PROCEDURE FOR ADMINISTRATION OF TOPICAL MEDICATIONS

The medications discussed here will be applied to the following sites:

- Eye: Drops, ointments
- Ear: Drops
- Nose: Sprays or drops
- Throat: Gargles, sprays
- Lungs: Inhaled medications
- Skin: Ointments, lotions, liniments, aerosols, tinctures, patches
- Vaginal and Rectal: tablets, ointments, suppositories, creams

Any topical medication requiring a sterile procedure must be administered by a licensed individual.

1. Eye Drops

Eye drops are most often used for a local effect. Be sure to place them in the correct eye. In some cases, drops may be placed in both eyes. Follow the directions carefully. Check the label to see if the bottle should be shaken before use.

Equipment

- η Medication tray, as applicable
- η Medication ordered
- η MAR

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
2. Wash hands.
3. Eye drops may come in a bottle with a dropper built into the cap, or a bottle with a dropper portion built in as a part of the bottle. If there is a dropper, keep the bottle upright to prevent the liquid from flowing into the dropper bulb. If the dropper is part of the bottle, it will be necessary to invert the bottle to get the liquid to the dropper mechanism.
4. Explain to the person what you are going to do and have the person sit down. Have him/her tilt his/her head back slightly and look up at the ceiling.
5. Using one hand, gently pull down on the lower eyelid to form a pouch.
6. Using the other hand, place your palm on the person's forehead to use as a support. Hold the dropper or dropper bottle between the thumb and index finger of this hand. Hold the end of the dropper about an inch above the eye, being careful not to touch anything with the dropper.
7. Gently squeeze the dropper to instill the prescribed number of drops into the pouch of the lower lid. Do not drop onto the eye itself.
8. Ask the person to close his/her eye for a minute to allow the medication to be distributed around the eye and to be absorbed. It is best not to blink.
9. Repeat the procedure in the other eye, if directed.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Instructions for Specific Dosage Forms

10. Replace the cap tightly.
11. Wash hands.
12. Clean and replace equipment.
13. Chart the medication administered.
14. Note any significant observations or complaints regarding the affected eye prior to the medication application and any unusual reactions or symptoms following the medication application.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The medication given.
2. The eye(s) into which the drops were applied.
3. The signature of the person administering the medication.
4. The time of administration.

2. Eye Ointment

Eye ointments are most often used for local effect. Be sure to place them in the correct eye. In some cases, the ointment may be placed in both eyes. Follow the directions carefully.

Equipment

- | | |
|---------------------------------|---------------|
| ηMedication tray, as applicable | ηMAR |
| ηMedication ordered | ηCotton balls |

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
2. Wash hands.
3. Explain to the person what you are going to do. Have the person sit or lie down.
4. Cleanse the eye gently with a cotton ball. Wipe from the inner corner outward once. If the ointment is to be applied to both eyes, use a clean cotton ball for each eye.
5. Remove the cover from the ointment tube.
6. Position the person with head back and looking upward. Retract the lower lid by gently pulling downward.
7. Approaching the eye from below, gently squeeze the tube and move it along the inside of the lower lid instilling about a one centimeter (one-third inch) thread. Break off ribbon of ointment from tube by releasing pressure and removing the tube. Do not use your fingers. Do not place ointment onto the eye itself.
8. Ask the person to close his/her eye for a minute to allow the medication to be distributed around the eye and to be absorbed. It is best not to blink.
9. Repeat the procedure in the other eye, if directed.
10. Replace the cap tightly.
11. Wash hands.
12. Clean and replace equipment.
13. Chart the medication administered.
14. Note any significant observations or complaints regarding the affected eye prior to the medication application and any unusual reactions or symptoms following the medication application.

CHARTING: Chart on the person's MAR. The information to be recorded will include:

1. The medication given.
2. The eye(s) into which the ointment was applied.
3. The signature of the person administering the medication.
4. The time of administration.

3. Ear Drops

Ear drops are most often used for local effect. Be sure to place them in the correct ear. In some cases, drops may be placed in both ears. Follow the directions carefully. Check the label to see if the bottle needs to be shaken before use.

Equipment

ηMedication tray, as applicable	ηMAR
ηMedication ordered	ηCotton balls

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
2. Be sure the medication is at room temperature before administering.
3. Wash hands.
4. Explain to the person what you are going to do.
5. Position the person:
 - Have the person lie down on his/her side with the opposite ear requiring the medication toward the surface. (The ear requiring the medication is upward)
 - If sitting in a chair, tilt the head sideways until ear is as horizontal as possible.
6. Clean entry to ear canal with a clean cotton ball.
7. Remove cover and draw up medication into the dropper.
8. Gently pull the earlobe upward and toward the back of the head to align the ear canal.
9. Hold the end of the dropper near the ear canal, being careful not to touch anything with the dropper so as not to contaminate it.
10. Squeeze the dropper or dropper bottle to instill the prescribed number of drops into the ear canal.
11. If the person desires a cotton ball, place a clean cotton ball loosely in the ear (provided the person does not have PICA behavior).
12. Have the person remain lying on his/her side for one to two minutes to allow the medication to be absorbed.
13. If medication is for both ears, reposition the person and repeat procedure.
14. Clean and replace equipment. Wash hands.
15. Chart the medication administered.
16. Note any significant observations or complaints regarding the affected ear(s) prior to the medication application and any unusual reactions or symptoms following the medication application.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The medication given and time of administration.
2. The number of drops instilled and the ear(s) into which it was applied.
3. The signature of the person administering the medication.

4. Nasal Medications

Nose drops or sprays are most often used for a local effect. Follow the directions carefully. Check the label to see if the bottle needs to be shaken before use.

Equipment

ηMedication tray, as applicable

ηMedication ordered

ηMAR

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
2. Wash hands.
3. Explain to the person what you are going to do. Have the person gently blow his/her nose without squeezing the nose, just before instilling the drops or spray.
4. Position the person in a sitting position with head tilted backward, or to the side if the medication needs to reach one or the other sinuses. If the person is unable to sit, place a rolled towel or pillow beneath the neck.
5. Remove the cap from the nasal medication.
6. Drop form:
Aim the tip of the dropper toward the nasal passage and squeeze the dropper to instill the prescribed number of drops into the nostril. Repeat in the opposite nostril. Instruct the person to breathe through the mouth as the drops are instilled. To prevent contamination of the remaining medicine, do not touch the dropper to nasal mucus membranes.
7. Spray form:
Place the tip of the container just inside the nostril. Occlude the opposite nostril by placing gentle pressure on the outside of the nose. Instruct the person to inhale as the container is squeezed. Administer the prescribed number of sprays. Do not release your grip on the sprayer until you have withdrawn it from the nostril to prevent nasal mucus and bacteria from entering the plastic bottle and contaminating the contents. Repeat in the opposite nostril.
8. Instruct the person to remain in position for one to two minutes to allow medication to be absorbed.
9. Rinse the dropper with water after each use to prevent contamination. Recap the container. Wash hands.
10. Chart the medication administered.
11. Note any significant observations or complaints regarding the nasal passages prior to the medication application and any unusual reactions or symptoms following the medication application.

CHARTING: Chart on the person's MAR. The information to be recorded will include:

1. The medication given.
2. The number of drops or sprays instilled.
3. The signature of the person administering the medication.
4. The time of administration.

5. Throat sprays

Sprays containing topical anesthetics such as benzocaine or phenol are available to treat sore throat pain. They are generally no more effective than sucking on a throat lozenge.

Equipment

ηMedication tray, as applicable

ηMedication ordered

ηMAR

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
2. Wash hands.
3. Explain to the person what you are going to do and have him/her sit down.
4. Have the person open his/her mouth as wide as possible. Then spray the medication as far back into the throat as possible.
5. Instruct the persons to try not to swallow and to hold the spray in his/her mouth for as long as possible. Do not have him/her drink any fluids for several minutes. Swallowing the throat spray is not harmful though may cause an upset stomach.
6. Wash hands.
7. Chart the medication administered.
8. Note any significant observations or complaints regarding the throat prior to the medication application and any unusual reactions or symptoms following the medication application.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The medication given. The time given.
2. The signature of the person administering the medication.

6. Inhalant medications

- For prn inhalers, do not wait until you need it to figure out how to use it.
- Some inhalers need to be primed, some do not. Some need to be shaken before and between each puff, some do not. If two puffs are prescribed, this usually means that there should be a minute interval between the two puffs. Familiarize yourself with the specifics for any given inhaler before helping a client to use it.
- Do not use the removable mouth piece for one type of inhaler on another type, even if it appears to fit. The mouthpieces are specific to the medication and may not work well on another.
- The key to inhalers is getting the medication into the lungs. Know what special techniques or methods need to be used for each individual.
- Inhalers can cause irritation in the mouth and throat. Ask if it is ok to have the person rinse his mouth after using the inhaler.

a. Metered dose inhalers

In a pressured metered dose inhaler (pMDI), the drug is present in a solution or suspension in propellants and surfactants. In the case of a suspension, the pMDI will need to be shaken before use to mix the drug with the propellants and surfactants. When the pMDI is fired, an accurately metered dose is set free with high velocity.

Equipment

η Medication tray, as applicable

η Medication ordered

η MAR

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
 2. Wash hands.
 3. If necessary, attach the stem of the canister into the hole of the mouthpiece.
 4. Shake the inhaler.
 5. Explain to the person what you are going to do.
 6. Position the person in a sitting position with head tilted backward slightly.
 7. Instruct the person to breathe out.
 8. Position the inhaler in one of the following ways:
 - a. Open mouth while holding inhaler 1 to 2 inches away
 - b. Use a spacer
 - c. In the mouth
- “a” is optimal, but “c” is acceptable for those who have difficulty with “a” or “b”
9. Press down on the inhaler to release medication as the person starts to breathe in slowly.
 10. Have the person breathe in slowly (3-5 seconds).
 11. Ask the person to hold his/her breath for 10 seconds to allow medication to reach deeply into the lungs.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Instructions for Specific Dosage Forms -

12. Repeat puffs as directed. Waiting one minute between puffs may permit the second puff to penetrate the lungs better.
13. Instruct the person to rinse his/her mouth with water after each use to prevent dry mouth and systemic absorption. Spit out the water, do not swallow.
14. If plastic spacers are used, they should be cleaned according to the manufactures directions at least once a week and allowed to air dry.
15. Wash hands.
16. Chart the medication administered.
17. Note any significant observations or complaints regarding the lungs and breathing prior to the medication administration and any unusual reactions or symptoms following the medication administration.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The inhalant medication given.
2. The amount of medication inhaled.
3. The signature of the person administering the medication.
4. The time of administration.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Instructions for Specific Dosage Forms -

b. Dry Powder Inhalers

In a dry powder inhaler (DPI), the drug is present in a single or multiple dosing chamber. The person should be able to inhale forcefully and deeply without coughing for optimal DPI performance. There are a number of different devices used. Following are instructions for just one device that is commonly prescribed.

Advair® or Serevent® DISKUS® use:

Equipment

ηMedication tray, as applicable ηMAR

ηMedication ordered

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route of administration, and time ordered.
2. Wash hands.
3. Hold the DISKUS® in one hand and put the thumb of your other hand on the thumb grip. Push your thumb away from you as far as it will go until the mouthpiece appears and snaps into position.
4. Hold the DISKUS® in a level, flat position with the mouthpiece towards the person. Slide the lever until it clicks in the open position.
5. Have the person breathe out fully while holding the DISKUS® away from the mouth. Do not allow the person to breathe out into the DISKUS® mouthpiece.
6. Put the mouthpiece to the person's lips. Have the person breathe in quickly and deeply through the DISKUS®. Do not breathe through the nose.
7. Remove the DISKUS® from the mouth and have the person hold his/her breath for about 10 seconds, or for as long as is comfortable. Then have the person breathe out slowly.
8. Have the person rinse his/her mouth with water after each use. Spit out the water, do not swallow.
9. Close the DISKUS® after the dose is taken. Put your thumb on the thumb grip and slide the thumb grip back towards you as far as it will go until it clicks shut. The lever will automatically return to its original position.
10. Keep the DISKUS® dry, do not wash the mouthpiece. Store in a dry place.
11. Wash hands.
12. Chart the medication administered.
13. Note any significant observations or complaints regarding the lungs and breathing prior to the medication administration and any unusual reactions or symptoms following the medication administration.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The inhalant medication given.
2. The amount of medication inhaled.
3. The signature of the person administering the medication.
4. The time of administration.

7. Creams/Lotions/Ointments for Use on the Skin

Many lotions, ointments and creams are prescribed for a variety of reasons including rashes and dry skin.

Equipment

- η Medication tray, as applicable
- η Medication ordered
- η Bandages or dressings as ordered.
- η Gloves
- η MAR

1. Check the information on the MAR. Compare it to the prescription label or order for the person's name, medication, route of administration and time ordered.
2. Wash and glove hands.
3. Gently clean the old medication from the affected area. Use water or hydrogen peroxide or a cleansing solution as prescribed by the physician. Do not cause irritation or tear irritated skin.
4. Apply a thin layer over the entire affected area. You may use a wooden tongue depressor, a cotton tipped applicator, or a gloved finger. Do not rub unless directed. Use caution to not further damage the area.
5. Apply a dressing if recommended by the physician. Wash hands.
6. Chart the medication administered.
7. Note any significant observations or complaints regarding skin irritation, sensitivity, or any reaction to the medication applied.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The topical medication given.
2. The signature of the person administering the medication.
3. The time of administration.

8. Aerosol Medications for Use on the Skin

There are a number of medications that are sprayed on the skin. For example Lanacane® for a sun burn.

Equipment

ηMedication tray, as applicable

ηMAR

ηMedication ordered

ηGloves

1. Check the information on the MAR. Compare it to the prescription label or order for the person's name, medication, route of administration and time ordered.
2. Wash and glove hands.
3. Clean the affected area as directed.
4. Shake the container before application.
5. Hold the container about six inches away from the skin. Some containers need to be held upright, others need to be held upside down. Check the label for specific directions.
6. Spray over the area in short, one to three second bursts. Use caution to avoid spraying into the eyes, nose, or mouth.
7. Wash hands.
8. Chart the medication administered.
9. Note any significant observations or complaints regarding skin irritation, sensitivity, or any reaction to the medication applied.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The topical medication given.
2. The signature of the person administering the medication.
3. The time of administration.

9. Transdermal patch

Some medications are contained in topical (transdermal) patches. Examples include Nitroglycerin patches, Transderm Scop®, and Duragesic® patches. These medications are absorbed through the skin. They are applied to specific areas of the skin which has first been cleaned and is free of hair. These patches should not be placed in the same spot day after day; the package insert should give advice regarding rotating sites.

Equipment

ηMedication tray, as applicable

ηMAR

ηMedication ordered

ηGloves

1. Check the information on the MAR. Compare it to the prescription label or order for the person's name, medication, route of administration and time ordered.
2. Wash and glove hands.
3. Clean the affected area as directed.
4. Apply patch to the specified area of the skin. Choose sites that are not subject to excessive movement, avoiding scars and wounds.
5. Wash hands.
6. Chart the medication administered.
7. Note any significant observations or complaints regarding skin irritation, sensitivity, or any reaction to the medication applied.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The topical medication given.
2. The signature of the person administering the medication.
3. The time of administration.

10. Vaginal Medications

Some medications such as those for vaginal yeast infections are administered vaginally. These come in the form of creams, ointments, suppositories, or tablets.

a. Vaginal Suppositories or Tablets:

Equipment

ηMedication tray	ηMAR
ηMedication ordered and applicator	ηGloves
ηWater soluble lubricant	ηTissue wipes

1. Check the information on the MAR; compare it to the prescription label or order for person's name, medication, route, and time ordered.
2. If possible, plan to instill the vaginal medication before the person retires for sleep so that the medication is retained for a prolonged period of time.
3. Have the person empty her bladder just before inserting the medication.
4. Wash and glove hands.
5. Provide privacy. Position the person on back with knees bent, legs spread.
6. Remove the vaginal suppository or tablet from its package by peeling back the protective foil closure. Moisten the suppository in warm water for a second or two.
7. Pull out plunger (inner rod) of plastic inserter until it stops.
8. Place smaller, pointed end of suppository or tablet snugly into the open end of the inserter.
9. Grasp barrel (outer cylinder) of inserter, at the bottom, with thumb and middle finger. The tip of the suppository or tablet may be lubricated with a water soluble lubricant for easier application.
10. Separate the labia and inset the applicator within the vagina, gently pushing as far as it will go comfortably without using force, generally about 2 to 4 inches. Instruct the person to relax by taking slow, deep breathes.
11. Depress the plunger all the way down to insert the medication into the vagina.
12. Carefully remove the applicator from the vagina, holding it by the barrel.
13. Apply a sanitary pad as necessary. This is recommended to prevent staining of clothing.
14. Have the person remain recumbent for at least 10 to 30 minutes.
15. Wash a reusable applicator with warm, soapy water (do not boil). It may be disassembled by pulling the plunger apart from the barrel. Rinse and dry.
16. Chart the medication administered.
17. Note any significant observations or complaints regarding vaginal irritation, sensitivity, or any reaction to the medication applied.

CHARTING: Chart on the person's MAR. The information to be recorded will include:

1. The vaginal medication given with the dosage and method of administration.
2. The signature of the person administering the medication.
3. The time of administration.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Instructions for Specific Dosage Forms -

b. Vaginal Creams or Ointments:

Equipment

ηMedication tray	ηMAR
ηMedication ordered and applicator	ηGloves
ηTissue wipes	

1. Check the information on the MAR, comparing it to the prescription label or order for the person's name, medication, route, and time ordered.
2. If possible, plan to instill the vaginal medication before the person retires for sleep so that the medication is retained for a prolonged period of time.
3. Have the person empty her bladder just before inserting the medication.
4. Wash and glove hands.
5. Provide Privacy. Position the person on back with knees bent, legs spread.
6. Remove cap from tube. Screw the applicator to the tube.
7. Squeeze the tube, forcing contents into the cylinder up to the prescribed amount as marked on the side of the cylinder or until full. Then remove applicator from the tube.
8. Separate the labia, holding the filled applicator by the cylinder, insert into the vagina, gently pushing as far as it will go comfortably without using force, generally about 2 to 4 inches. Instruct the person to relax by instructing to breathe through the mouth or take deep breaths.
9. Press plunger and deposit cream or ointment into the vagina. While keeping plunger depressed, remove the applicator from the vagina.
10. If the applicator is to be reused, it will need to be cleaned after each use.
 - Take applicator apart and wash with soap and warm water. To take apart, hold cylinder of plunger and turn cap counterclockwise.
 - To reassemble, drop plunger back into cylinder as far as it will go. Place cap on end of the plunger and turn clockwise until cap is tight.
11. Apply a sanitary pad as necessary. This is recommended to prevent staining of clothing.
12. Have the person remain recumbent for at least 10 to 30 minutes.
13. Chart medication administered.
14. Note any significant observations or complaints regarding skin irritation, sensitivity, or any reaction to the medication applied.

CHARTING: Chart on the person's MAR. The information to be recorded will include:

1. The vaginal medication given.
2. The dosage and method of administration.
3. The signature of the person administering the medication.
4. The time of administration.

11. Rectal Medications

Rectal medications come in the form of suppositories, creams, and ointments. Some of the uses of these medications are to control nausea, treat hemorrhoids, or administer pain medications including acetaminophen and narcotics. These are often used when medications cannot be given by mouth.

a. Rectal Suppositories:

Equipment

- η Medication tray
- η MAR
- η Medication ordered and applicator
- η Gloves
- η Water soluble lubricant
- η Tissue wipes
- η Chux® or other absorbent pad if needed

1. Check the information on the MAR. Compare it to the prescription label or order for the person's name, medication, route of administration and time ordered.
2. Wash and glove hands.
3. Ask the person to lie down on his/her side (preferably left side).
4. Remove the suppository from the foil wrap. In hot weather the suppository may become too soft to handle properly. If that happens, place the suppository in the refrigerator, in a glass of cold water, or under running cold water until it becomes firm.
5. Moisten the suppository with water or apply a small amount of lubricant to the tip for easier insertion.
6. Insert the pointed end of the suppository into the rectum, pushing gently with your gloved forefinger. Encourage the person to relax by breathing through the mouth or taking deep breaths.
7. After slowly withdrawing your finger, press a folded tissue against the anus until the urge to expel subsides. Leave the person in a comfortable position.
8. Note any unusual reactions or symptoms following the insertion of the rectal medication.
9. Chart the medication administered.

b. Rectal Creams or Ointments: (including hemorrhoidal treatments)

Equipment

- η Medication tray
- η MAR
- η Medication ordered and applicator
- η Gloves
- η Water soluble lubricant
- η Tissue wipes
- η Chux® or other absorbent pad if needed

1. Check the information on the MAR. Compare it to the prescription label or order for the person's name, medication, route of administration and time ordered.
2. Wash and glove hands.
3. Ask the person to lie down on his/her side (preferably left side).
4. Remove cap from tube and attach applicator to the tube.
5. Lubricate the tip of the applicator with water-soluble lubricant to help ease it into the rectum. Encourage the person to relax by breathing through the mouth or taking deep breaths.
6. After slowly withdrawing the applicator tip, press a folded tissue against the anus until the urge to expel subsides.
7. Note any unusual reactions or symptoms following the insertion of the rectal medication.
8. Leave person in comfortable position.
9. Chart the medication administered.

CHARTING:

Chart on the person's MAR. The information to be recorded will include:

1. The rectal medication given.
2. The dosage and method of administration.
3. The signature of the person administering the medication.
4. The time of administration.

APPENDIX D

DIETARY FIBER TABLES

Food	Fiber in grams/serving
Fruits	
Apple (with skin)	3.5/one medium sized apple
Apricot (fresh)	1.8/3 apricots
Banana	2.5/1 banana
Cantaloupe	2.7/half edible portion
Dates	13.5/1 cup (chopped)
Grapefruit	1.6/half edible portion
Grapes	2.6/10 grapes
Oranges	2.6/1 orange
Peach (with skin)	2.1/ 1 peach
Pear (with skin)	4.6/ 1 pear
Pineapple	2.2/ 1 cup (diced)
Prunes	11.9/ 11 dried prunes
Raisins	2.2/packet
Strawberries	3.0/ 1 cup
Juice	
Apple	0.74/ 1 cup
Grapefruit	1.0/ 1 cup
Grape	1.3/ 1 cup
Orange	1.0/ 1 cup
Vegetables (cooked)	Fiber in grams/serving
Asparagus	1.5/ 7 spears
Beans, string, green	3.4/ 1 cup
Broccoli	5.0/ 1 stalk
Cabbage	2.9/ 1 cup
Cauliflower	2.1/ 1 cup
Peas	7.2/ 1 cup
Potato (with skin)	2.3/ 1 boiled
Squash	3.4/ 1 cup
Sweet potatoes	2.7/ 1

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Dietary Fiber Tables -

DIETARY FIBER TABLES

Vegetables (Raw)	Fiber in grams/serving
Cucumber	0.2/ 6 to 8 slices with skin
Lettuce	2.0/ 1 wedge iceberg
Mushrooms	0.8/ half cup
Onions	1.3/ 1 cup
Peppers	1.0/ 1 pepper
Spinach	8.0/ 1 cup
Legumes	Fiber in grams/serving
Baked beans	8.6/ 1 cup
Dried peas	4.7/ half cup (cooked)
Kidney beans	7.4/ half cup (cooked)
Lima beans	2.6/ half cup (cooked)
Breads, pastas, and flours	
Bagels	1.1/ half bagel
Bran muffins	6.3/ muffin
Cracked wheat bread	4.1/ slice
Oatmeal	5.3/ 1 cup
White bread	0.55/ slice
Whole wheat bread	1.66/ slice
Pasta and rice, cooked	Fiber in grams/serving
Macaroni	1.01/ 1 cup (cooked)
Rice, brown	2.4/ 1 cup (cooked)
Rice, polished	0.6/ 1 cup (cooked)
Spaghetti (regular)	1.0/ 1 cup (cooked)
Flours and grains	
Bran, oat	8.3/ oz
Bran, wheat	12.4/ oz
Rolled oats	13.7/ 1 cup (cooked)
Nuts	
Almonds	3.6/ half cup (slivered)
Peanuts	11.7/ 1 cup

**APPENDIX E -
SAMPLE -
DOCUMENTATION FORMS -**

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Sample Documentation Forms -

MEDICATION DISPOSITION RECORD

Date	Resident	Prescription #, Drug, Strength	#	Signature	Witness	How Disposed	Returned to pharmacy, pharmacist signature

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Sample Documentation Forms -

MEDICATION DISPOSITION RECORD

RESIDENCE COMPLETE

PHARMACY COMPLETE

Date	Resident	Prescription #, Drug, & Strength	Quantity	Destroyed at residence (reason)	Returned to pharmacy (reason)	Witness (signature)	Pharmacist signature	Date

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Sample Documentation Forms -

Medication Administration Record (MAR)

Medication	HR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
	start																				
	stop																				
	start																				
	stop																				
	start																				
	stop																				
	start																				
	stop																				
Diagnosis:																					
Allergies:										IN	Name					IN	Name				
Name:										Physician:											
Date of Birth:										Phone number:											

**APPENDIX F -
DRUG CLASSIFICATION -
TABLES -**

PAIN MEDICATIONS -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED IN TREATING PAIN

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Analgesics (pain medications, non-narcotic)		
Acetaminophen (Tylenol®)	Relieves pain, reduces fever.	Allergic reaction: rash, fever, difficulty breathing. Overdosage can cause liver damage and death.
Aspirin	Reduces pain, inflammation, fever. Decreases ability to clot by making platelets less sticky.	Stomach upset including ulcers, easy bruising and bleeding. Ringing in ears with high doses. Allergic reaction: shortness of breath, wheezing, itching, swelling of face, lips.
Nonsteroidal Anti-inflammatory Drugs (NSAIDs)		
Ibuprofen (Motrin®, Advil®), Naproxen (Naprosyn®), Diclofenac (Voltaren®), Celecoxib (Celebrex®), Indomethacin (Indocin®)	Relieves pain, reduces inflammation and fever.	Stomach upset including ulcers. Headache, easy bruising and bleeding, ringing in ears, fluid retention, dizziness, weakness. Allergic reaction: shortness of breath, wheezing, itching, swelling of face, lips.
Tramadol (Ultram®)	Used to treat pain.	Stomach upset, nausea, vomiting, constipation, dizziness, headache, insomnia, flushing. Lowers seizure threshold (increases likelihood of having a seizure).
Narcotic analgesics		
Codeine	Relief of mild to moderate pain. Suppresses cough.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating, slowed or troubled breathing. Lowers seizure threshold.
Hydrocodone (Lortab®, Vicodin®, Norco®)	Relief of mild to moderate pain. Suppresses cough.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating, slowed or troubled breathing. Lowers seizure threshold
Propoxyphene HCL (Darvon®, Darvocet N 100®)	Relief of mild to moderate pain.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating, slowed or troubled breathing. Lowers seizure threshold.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED IN TREATING PAIN

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Oxycodone (Oxycontin®), Percocet®, Endocet®)	Relieves moderate to severe pain.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating. Lowers seizure threshold.
Hydromorphone (Dilaudid®)	Relieves moderate to severe pain.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating, slowed or troubled breathing. Lowers seizure threshold.
Morphine (MS Contin®)	Relieves moderate to severe pain.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating, slowed or troubled breathing. Lowers seizure threshold.
Fentanyl (Duragesic®)	Relieves moderate to severe pain.	Nausea, vomiting, sedation, constipation, dry mouth, drowsiness, itching, rash, flushed face, increased sweating, slowed or troubled breathing. Lowers seizure threshold.
Steroids (oral)		
Prednisone, Methylprednisolone (Medrol®), Dexamethasone (Decadron®), Hydrocortisone (Cortef®)	Used to decrease inflammation associated with arthritis, chronic respiratory problems, allergic reactions, and other inflammatory diseases.	Indigestion, nausea, vomiting, weight gain, fluid retention with swelling of the feet, confusion, depression, puffy face.
Muscle Relaxants		
Cyclobenzaprine (Flexeril®)	Used to treat muscle sprains, strains, or spasms.	Drowsiness, dizziness, dry mouth, swelling of face, weakness.
Methocarbamol (Robaxin®)	Used to treat muscle sprains, strains, or spasms.	Drowsiness, dizziness, flushing of the face, nausea, vomiting, rash, nasal congestion.
Baclofen (Lioresal®)	Treatment of muscle spasticity.	Drowsiness, dizziness, slurred speech, difficulty sleeping, weakness, constipation, nausea.

INFECTIOUS DISEASES-

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT INFECTIONS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Penicillins		
Penicillin, Amoxicillin, Ampicillin, Dicloxacillin, Amoxicillin/Clavulanic Acid (Augmentin®)	Used to treat infections caused by bacteria.	Diarrhea, nausea, stomach cramps, seizures. Allergic reaction: rash, difficulty breathing, or swelling of the face.
Cephalosporins		
Cephalexin (Keflex®), Cefuroxime (Ceftin®), Cefaclor (Ceclor®), Cefadroxil (Duricef®), Ceftriaxone	Used to treat infections caused by bacteria.	Diarrhea, nausea, stomach cramps, vaginal itching and discharge if overgrowth of yeast. Allergic reaction: rash, difficulty breathing, or swelling of the face.
Macrolides		
Azithromycin (Zithromax®), Clarithromycin (Biaxin®), Erythromycin	Used to treat infections caused by bacteria. Often used to treat respiratory infections.	Diarrhea, nausea, stomach cramps, vomiting. Allergic reaction: rash, difficulty breathing, or swelling of the face.
Sulfonamides		
Trimethoprim/Sulfamethaxazole (Bactrim®, Septra®)	Used to treat infections caused by certain bacteria. Generally effective against MRSA. Often used to treat urinary tract infections.	Nausea, vomiting, loss of appetite, dizziness, fever, muscle and joint pain. Allergic reaction: rash, difficulty breathing, or swelling of the face.
Flouroquinolones		
Ciprofloxacin (Cipro®), Levofloxacin (Levaquin®), Norfloxacin (Noroxin®), Moxifloxacin (Avelox®)	Used to treat bacterial infections caused by a wide spectrum of bacteria.	Headache, restlessness, dizziness, nausea, diarrhea, stomach pain, seizures, pain in calves (Achilles tendinitis). Allergic reaction: rash, difficulty breathing, facial swelling.
Tetracyclines		
Tetracycline, Doxycycline (Vibramycin®), Minocycline (Minocin®)	Used to treat bacterial infections. Also used to help control acne.	Diarrhea, nausea, stomach cramps, headache, loss of appetite, dizziness. Allergic reaction: rash, difficulty breathing, facial swelling.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT INFECTIONS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Others:		
Clindamycin (Cleocin®)	Used to treat bacterial infections.	Diarrhea, nausea, vomiting. Allergic reaction: rash, difficulty breathing, or swelling of the face.
Metronidazole (Flagyl®)	Used to treat infections, often abdominal infections. Used to treat parasites such as Giardia.	Dizziness, headache, nausea, diarrhea, unsteadiness, seizures, dry mouth, metallic taste, numbness, tingling of arms or legs, vaginal yeast infections. Allergic reaction: rash, difficulty breathing, or swelling of the face.
Nitrofurantoin (Macrochantin®, Macrobid®)	Used to treat urinary tract infections.	Stomach upset, vomiting, diarrhea, loss of appetite, drowsiness, headache, dizziness, muscle ache. Allergic reaction: rash, difficulty breathing, or swelling of the face
Antifungals (used to treat fungus infections)		
Acyclovir Famciclovir (Famvir®) Valacyclovir (Valtrex®)	Genital herpes Herpes zoster (shingles) Chickenpox	Nausea, vomiting, diarrhea, headache, rashes. Rarely, kidney damage and confusion.
Amantadine Rimantadine	Influenza A	Nausea, anorexia, nervousness, light-headedness, confusion, insomnia
Interferon-alpha	Hepatitis B and C	Flu-like symptoms, depression, low white blood cell count, anemia
Oseltamavir (Tamiflu®)	Influenza A and B	Nausea and vomiting, dizziness
Penciclovir (cream) (Denavir®)	Cold sores (oral herpes)	Headache, burning at the site of application
Ribavirin	Respiratory syncytial virus (RSV) in children. Hepatitis C	Breakdown of blood cells causing anemia
Zanamivir (inhaled powder) (Relenza®)	Influenza A and B	Irritation of the airways
Treatment for candidiasis (yeast)		
Fluconazole (Diflucan®)	Used to treat oral, vaginal, and other systemic yeast infections.	Headache, seizure, dizziness, rash, nausea, diarrhea.

NERVOUS SYSTEM -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT NERVOUS SYSTEM DISORDERS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Antiepileptic/Anticonvulsant Agents		
Valproate (Depakene®) Divalproex (Depakote®)	Used as a primary drug to treat generalized tonic-clonic seizures, as well as partial seizures and absence seizures including atypical absence, myoclonic and atonic seizures.	Weight gain, nausea, vomiting, hair loss, easy bruising, tremor
Lamotrigine (Lamictal®)	Used as a primary drug to treat generalized tonic-clonic seizures, as well as partial seizures and absence seizures including atypical absence, myoclonic and atonic seizures.	Rash, nausea, dizziness, somnolence.
Levetiracetam (Keppra®)	Used as a primary drug to treat generalized tonic-clonic seizures, as well as partial seizures and absence seizures including atypical absence, myoclonic and atonic seizures.	Infection, fatigue, somnolence, dizziness, agitation, anxiety.
Carbamazepine (Tegretol®) Oxcarbazepine (Trileptal®)	Used to treat generalized tonic-clonic seizures and partial seizures	Nausea, hyponatremia (low sodium levels), rash, itching, sedation, headache, blurred or double vision.
Topiramate (Topamax®)	Used to treat generalized tonic-clonic seizures and partial seizures	Weight loss, kidney stones, fatigue, nervousness, confusion, depression, anorexia, anxiety, tremor.
Zonisamide (Zonegran®)	Used to treat generalized tonic-clonic seizures and partial seizures. Sometimes used to treat absence seizures.	Nausea, anorexia, somnolence, dizziness, ataxia, confusion.
Phenytoin (Dilantin®)	Used to treat generalized tonic-clonic seizures and partial seizures	Gingival hyperplasia, increase in body hair, rash, confusion, slurred speech, double vision, ataxia
Gabapentin (Neurontin®) Pregabalin (Lyrica®)	Used to treat partial seizures including secondary generalized seizures	Dizziness, somnolence, ataxia. Pregabalin also causes weight gain.
Ethosuximide (Zarontin®)	Used to treat absence seizures	Nausea, vomiting, insomnia, drowsiness

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT NERVOUS SYSTEM DISORDERS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Antiepileptic/Anticonvulsant Agents		
Clonazepam (Klonopin®)	Sometimes used to treat absence seizures, restless leg syndrome	Ankle swelling, palpitations, ataxia, confusion, dizziness, drowsiness, headache, blurred vision.
Felbamate (Felbatol®)	Used to treat atypical absence, myoclonic, and atonic seizures	Nausea, vomiting, anorexia, weight loss, insomnia, dizziness, headache, ataxia.
Phenobarbital, Primidone	Older medications used to treat seizure disorders	Nausea, rash, sedation, lethargy, hyperactivity, ataxia, behavioral changes.
Parkinson's medications		
Trihexphenidyl (Artane®) Benztropine (Cogentin®)	Anticholinergic drugs used in combination with other drugs to treat Parkinson's. Used to treat side effects of antipsychotic medications.	Dry mouth, constipation, confusion, hallucinations, difficulty urinating, tachycardia (fast heart rate), These can reduce the ability to sweat so avoid excessive exercise and sun.
Selegiline (Eldepryl®)	MAO type B inhibitor used to treat Parkinson's. (Because it is a selective MAO inhibitor, no special diet is required as is needed with the nonselective MAOI's used to treat depression.)	Nausea, headache, insomnia, confusion
Carbidopa/levodopa (Sinemet®)	Dopamine precursor, very effective for treating Parkinson's symptoms.	Dizziness, confusion, nausea, decreased appetite, nightmares, difficulty urinating, constipation.
Ropinirole (Requip®) Pramipexole (Mirapex®) Bromocriptine (Parlodel®)	Dopamine agonist: synthetic agents that stimulate dopamine receptors in the treatment of Parkinson's.	Nausea, vomiting, sleepiness, orthostatic hypotension, confusion, hallucinations, peripheral edema.
Tolcapone (Tasmar®), Entacapone (Comtan®),	COMT inhibitors which increase the amount of time that levodopa remains in the bloodstream.	Hallucinations, confusion, nausea, diarrhea, dyskinesia, orthostatic hypotension. Elevations in liver enzymes can occur and must be monitored.
Amantadine (Symmetrel®)	This antiviral medication has mild antiparkinsonian activity. The mechanism by which it works is uncertain.	Ankle edema, confusion, hallucinations, nightmares.

PSYCHIATRIC -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT PSYCHIATRIC DISORDERS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
<p>Antipsychotics</p> <p>Chlorpromazine (Thorazine®) Fluphenazine (Prolixin®) Haloperidol (Haldol®) Perphenazine (Trilafon®) Thioridazine (Mellaril®) Thiothixene (Navane®) Trifluoperazine (Stelazine®)</p>	<p>Older generation antipsychotics (neuroleptics) used to treat psychiatric disorders such as schizophrenia.</p>	<p>Dystonia – acute muscle spasms of specific muscle groups such as spasm of neck muscles drawing the head to one side Akathisia – feeling of restlessness and irresistible urge to move parts of the body, with agitation, jitteriness, inability to sit still. Parkinson’s symptoms – drooling, tremors, pill-rolling movement of fingers, mask-like appearance of face, shuffling, slow speech. Tardive Dyskinesia – abnormal, involuntary movements that occur after long-term use of antipsychotics. These mainly affect the facial muscles, hands, feet; movements include chewing, lip-smacking, puffing of cheeks, grimacing, rapid blinking, etc. Other – dry mouth, drowsiness, constipation, confusion, dizziness, weakness, weight gain.</p>
<p>Aripiprazole (Abilify®) Clozapine (Clozaril®) Zyprazidone (Geodon®) Risperidone (Risperdal®) Quetiapine fumarate (Seroquel®) Olanzapine (Zyprexa®)</p>	<p>Second and third generation antipsychotic drugs also known as atypical antipsychotics</p>	<p>Elderly patients with dementia-related psychosis are at an increased risk of death when treated with these drugs when compared to placebo. Also: nausea, constipation, weight loss or gain, hyperglycemia, decrease in sodium levels, orthostatic hypotension, drowsiness, sedation. Clozapine: agranulocytosis (loss of production of white blood cells which fight infections) – therefore need regular checks on white blood cell count.</p>

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT PSYCHIATRIC DISORDERS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Antidepressants		
Amitriptyline (Elavil®) Clomipramine (Anafranil®) Desipramine (Norpramin®) Imipramine (Tofranil®) Doxepin (Sinequan®) Nortriptyline (Pamelor®)	Tricyclic/Tetracyclic antidepressants used to treat depression and other mood disorders. Not used as much anymore due to side effects. Imipramine also used to treat bed wetting.	Dry mouth, constipation, blurred vision, drowsiness, tremor, weight gain, dizziness, and seizures.
Phenelzine (Nardil®) Tranylcypromine (Parnate®)	Monoamine oxidase inhibitors (MAOI's) used to treat depression.	Dizziness, lightheadedness, fainting, drowsiness, fast heart rate, constipation, dry mouth, weight gain. Hypertensive crisis; this is a sudden increase in blood pressure that can cause severe headache, nausea, vomiting, sweating, and chest pain. Certain foods and drinks interact with MAOI's and can cause a hypertensive crisis. These foods include: cheeses, sour cream, smoked meats, pepperoni, alcoholic beverages, caffeine, sauerkraut, bananas, raisins, etc.
Fluoxetine (Prozac®) Fluvoxamine (Luvox®) Paroxetine (Paxil®) Sertraline (Zoloft®) Escitalopram (Lexapro®)	Selective Serotonin Reuptake Inhibitors (SSRI's) used to treat depression, obsessive-compulsive disorder, bipolar disorder, panic disorders, and eating disorders	Headache, nervousness, difficulty sleeping, drowsiness, dizziness, dry mouth, nausea, diarrhea, itching, rash, sweating.
Venlafaxine (Effexor®) Duloxetine (Cymbalta®)	Serotonin/Norepinephrine Reuptake Inhibitor: used to treat major depression, anxiety disorder.	Headache, drowsiness, dizziness, weakness, nausea, constipation, dry mouth, sweating, palpitations, increased blood pressure
Bupropion (Wellbutrin®)	Treatment of depression. Also used in smoking cessation.	Agitation, difficulty sleeping, headache, restlessness, confusion, tremor, nausea, dry mouth, constipation, seizures, rash.
Trazadone (Desyrel®)	Used to treat depression. Also for anxiety, schizophrenia.	Drowsiness, headache, confusion, tremor, weakness, blurred vision, dry mouth, nausea

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT PSYCHIATRIC DISORDERS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Sedative-hypnotics (antianxiety drugs)		
Benzodiazepines		
Alprazolam (Xanax®) Chlordiazepoxide (Librium®) Clonazepam (Klonopin®) Diazepam (Valium®) Lorazepam (Ativan®)	Benzodiazepines used to treat anxiety, PTSD, obsessive compulsive disorder. Also used in epilepsy, spasticity, and sedation prior to procedures.	Confusion, dizziness, drowsiness, fatigue, lethargy, headache, rash, diarrhea, weakness, blurred vision, abnormal sweating.
Temazepam (Restoril®), Flurazepam hydrochloride (Dalmene), Quazepam (Doral®), Triazolam (Halcion®)	Benzodiazepines used for insomnia (sleep disorders).	Confusion, dizziness, rash, fatigue, anxiety, lethargy, headache, weakness.
Benzodiazepine-related hypnotics		
Zolpidem (Ambien®), Zaleplon (Sonata®), Eszopiclone (Lunesta®)	Used for the treatment of insomnia. Faster acting but shorter duration.	Dizziness, headache, somnolence, elevated blood pressure, anxiety, fatigue, binge-eating.
Barbiturates		
Pentobarbital (Nembutal®), Secobarbital (Seconal®), Butalbital (Fioricet®, Fiorinal®), Phenobarbital (Luminal®)	Sedative: lowers excitement and calms the awake person. Hypnotic: produces drowsiness and promotes sleep. Used mostly for induction of anesthesia. Phenobarbital also used for seizures.	Nausea, rash, sedation, lethargy, hyperactivity, ataxia, behavioral changes.
Other psychiatric medications		
Bupirone (Buspar®)	Used to treat anxiety disorders.	Drowsiness, dizziness, restlessness, nausea, headache.
Lithium (Eskalith®, Lithobid®)	Used to treat manic-depressive disorders. (Bipolar disorders)	Increased thirst, nausea, stomach upset, weight gain, tremor, rash, acne, weakness. Signs of overdose: severe drowsiness, tremor, loss of appetite, vomiting, muscle twitching, confusion, seizures.

CARDIOVASCULAR -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

CARDIAC MEDICATIONS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Antihypertensive medications (blood pressure medications) and Diuretics		
Diuretics		
Hydrochlorothiazide (HCTZ®) Furosemide (Lasix®) Triamteriene/HCTZ (Dyazide®)	Diuretic used for treating high blood pressure by causing increased elimination of fluid and sodium. Used to decrease water retention (swelling) from heart and kidney disease.	Dizziness, fainting, low potassium level, rash, thirst, irregular heart beat, weakness. May affect blood sugar levels in diabetics.
Spirolactone	Diuretic used for high blood pressure and fluid retention in liver disease	High potassium, weakness, dizziness, diarrhea, nausea, sweating.
ACE Inhibitors		
Benazepril (Lotensin®), Captopril (Capoten®), Enalapril (Vasotec®), Fosinopril (Monopril®), Lisinopril (Zestril®), Moexipril, Perindopril, Quinapril, Ramipril (Altace®), Trandolapril	Used to treat high blood pressure, heart failure, and enlarged hearts. Often used in diabetic patients and in patients with kidney disease.	Cough, facial and tongue/lip swelling, dizziness, fainting, rash, diarrhea, stomach upset, high potassium, and dry mouth.
ARB's		
Candesartan (Atacand®), Irbesartan (Avapro®), Losartan (Cozaar®), Telmisartan (Micardis®), Valsartan (Diovan®)	Used to treat high blood pressure, heart failure, and enlarged hearts. Often used in patients that don't tolerate ACE inhibitors.	Like ACE inhibitors but do not cause a dry cough. May see nausea, dry mouth, and abdominal pain
Alpha Blockers		
Prazosin (Minipress®) Terazosin (Hytrin®)	Used to treat high blood pressure. Also used to treat enlarged prostates.	Dizziness, fainting, drowsiness, weakness, headache, swelling of feet and ankles.
Beta Blockers		
Atenolol, Metoprolol, Propranolol, Timolol, Pindolol, Nadolol,	Used to treat high blood pressure; usually given after heart attacks; used to control heart rates in atrial fibrillation	Can worsen asthma. May mask symptoms of low blood sugar in persons using insulin for diabetes. Also fatigue, dizziness, slow heart rate, rash, cold hands and feet due to decreased blood flow to extremities.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

CARDIAC MEDICATIONS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Combination alpha and beta blockers		
Carvedilol (Coreg®), Llabetalol	Used to treat high blood pressure, heart failure (CHF) due to cardiomyopathies.	Hypotension, dizziness, fatigue, hyperglycemia, diarrhea, weight gain, weakness.
Calcium Channel Blockers		
Nifedipine (Procardia®), Amlodipine Norvasc®, Felodipine (Plendil®), Verapamil, Diltiazem (Cardizem®), Nicardipine	Used to treat high blood pressure. Can help control heart rate in atrial fibrillation.	Headache, dizziness, flushing, nausea, swelling of lower legs. Constipation (verapamil)
Sympathetic Blockers		
Clonidine, Guanfacine, Methyldopa, Guanabenz	Used to treat high blood pressure.	Dry mouth, sedation, sexual dysfunction.
Nitrates		
Nitroglycerin (NitroDur®, NitroBid®, Nitrostat®)	Used to prevent or treat chest pain (angina)	Dizziness, lightheadedness, fainting (especially when standing up too quickly), headache, blurred vision, dry mouth, flushing.
Isosorbide Dinitrate (Isordil®)	Used to prevent or treat chest pain (angina)	Dizziness, lightheadedness, fainting (especially when standing up too quickly), headache, blurred vision, dry mouth, flushing.
Isosorbide Mononitrate (Imdur®)	Used to prevent or treat chest pain (angina)	Dizziness, nausea, vomiting, headache, hypotension (low blood pressure)
Anticoagulants (“blood thinners”) and antiplatelet drugs		
Warfarin (Coumadin®)	Used to treat and prevent blood clots (DVT’s), and also used to prevent strokes and heart attacks	Bleeding: can cause major or fatal bleeding especially if there is a history of GI bleeding, hypertension, open wounds, etc, and if the dose is too high. Also: nausea, vomiting, diarrhea, headache, dizziness, fatigue, joint pain. Foods high in Vitamin K (leafy green vegetables, broccoli, spinach, etc) can decrease the effectiveness of warfarin. Routine lab testing is important to make sure the dose is in the right range.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

CARDIAC MEDICATIONS

EXAMPLES	INDICATIONS/USE	SIDE EFFECTS
Anticoagulants (continued)		
Aspirin (Ecotrin®, Anacin®, Bufferin®)	Used to prevent strokes and heart attacks by preventing platelets from forming clumps which block small blood vessels	Nausea, indigestion, heartburn, ulcer formation, easy bruising and bleeding, ringing in the ears, allergic reaction, dizziness, weakness, confusion
Dipyridamole Aggrenox® - combination of aspirin and dipyridamole	Used to prevent strokes by preventing platelets from forming clumps which block small blood vessels	Headache, stomach upset, diarrhea.
Clopidogrel (Plavix®)	Used to prevent strokes: see Dipyridamole above.	Rash, diarrhea. Rarely stomach upset.
Antihyperlipidemic medications (cholesterol lowering agents)		
Cholestyramine (Questran®)	Used to lower cholesterol, also used for some gastrointestinal conditions. It binds substances in the gut and those substances pass out of the body without being absorbed.	constipation, nausea, vomiting, indigestion, gas
Statins: Fluvastatin (Lescol®) Lovastatin (Mevacor®) Pravastatin (Pravachol®) Simvastatin (Zocor®) Atorvastatin (Lipitor®) Rosuvastatin (Crestor®)	Lowers cholesterol by blocking an enzyme needed to make cholesterol in the body	Headache, insomnia, dizziness, constipation, dyspepsia (indigestion), muscle and joint pain, weakness, elevated liver enzymes
Ezetimibe (Zetia®)	Used to lower cholesterol	Fatigue, diarrhea, elevated liver enzymes, muscle and joint pain
Nicotinic acid or niacin (Niaspan®, Niacor®, Slo-Niacin®)	This is a vitamin supplement that can lower cholesterol levels	nausea, bloating, gas, headache, flushing, dizziness, palpitations, nervousness, gout, leg cramps and muscle pain
Fibrates Gemfibrozil (Lopid®) Fenofibrate (Tricor®)	Used to lower triglycerides and raise HDL (good cholesterol) levels	Dyspepsia, headache, fatigue, rash, nausea, vomiting, constipation or diarrhea. Elevated liver enzymes with Tricor®

RESPIRATORY -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT RESPIRATORY DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Bronchodilators		
Albuterol (Ventolin®), Proventil®), Levalbuterol (Xopenex®), Pirbuterol (Maxair® Autohaler)	Fast acting inhaler to open up the airways and make breathing easier. Used to treat asthma, chronic lung diseases. Short acting: 4-6 hours.	Fast heart rate, palpitations, flushing of the face, nausea, indigestion, dry mouth, coughing, nervousness, hyperactivity, headache, insomnia, dizziness, tremor
Salmeterol (Serevent®)	Long-acting inhaler that comes in a discus. Used to make breathing easier by opening up the airways. Used to treat asthma and other chronic lung problems. Since this takes a while to work, it cannot be used for acute asthma attacks.	Fast heart rate, palpitations, flushing of the face, nausea, indigestion, dry mouth, coughing, nervousness, hyperactivity, headache, insomnia, dizziness, tremor
Theophylline (TheoDur®, Theo-24®)	Oral bronchodilator used for long term treatment of asthma.	Nausea, vomiting, diarrhea, stomach pain, tremor, nervousness, headache, agitation, palpitations, seizures.
Anticholinergic Agents		
Ipratropium (Atrovent®)	Makes breathing easier by widening the airways, used for long-term treatment of lung diseases.	Dry mouth, nausea, indigestion, cough, nervousness, dizziness, headache, blurred vision, heart palpitations.
Anti-inflammatory agents (inhalers and nasal sprays)		
Beclomethasone (Vanceril®, Vancenase AQ® {nasal spray}); Triamcinolone (Azmacort®, Nasacort AQ® {nasal spray}); Flunisolide (Aerobid®, Nasalide® {nasal spray}); Budesonide (Pulmicort®, Rhinocort Aqua® {nasal spray})	Used to decrease inflammation in the airways or nasal passages.	Oral inhalers: thrush, cough, hoarseness, dry mouth, nausea, headache. Nasal sprays: burning or stinging inside the nose, sore throat, sneezing.
Formoterol (Foradil®)	Powder for oral inhalation used to treat chronic asthma symptoms and to prevent bronchospasm.	Chest pain, palpitation, anxiety, dizziness, fever, diarrhea.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT RESPIRATORY DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Anti-inflammatory agents (inhalers and nasal sprays) continued		
Cromolyn (Intal®, Nasalcrom®)	Used to prevent asthma or allergy symptoms.	Oral: unpleasant taste, coughing, hoarseness, dry mouth, throat irritation. Nasal: sneezing, nose irritation and burning, nosebleeds.
Fluticasone/salmeterol (Advair®) Budesonide/formoterol (Symbicort®)	Combination inhaler with both a bronchodilator and steroid to reduce inflammation.	Headache, sore throat, dizziness, nausea, diarrhea, thrush.
Antihistamines		
Diphenhydramine (Benadryl®), Chlorpheniramine (Chlor-trimeton®)	Used for allergic reactions, cold symptoms. Sedating so often used for sleep.	Drowsiness, dizziness, headache, blurred vision, nervousness, stomach upset, dry mouth and nasal passages, constipation, dizziness.
Loratadine (Claritin®), Desloratadine (Clarinex®), Fexofenadine (Allegra®), Cetirizine (Zyrtec®), Levocetirizine (Xyzal®)	Used for relief of seasonal allergy symptoms.	Mild drowsiness, headache, dry mouth, anxiety.
Azelastine (Astelin®), Olopatadine (Patanase®)	Antihistamine nasal spray used to treat seasonal allergic rhinitis.	Headache, somnolence, bitter taste, cough.
Olopatadine (Patanol®)	Antihistamine eye drops used to treat allergic conjunctivitis.	Headache, sore throat, nausea.
Leukotriene receptor agonists		
Montelukast (Singulair®)	Used to treat asthma, allergic rhinitis.	Dizziness, fatigue, fever, rash, abdominal pain, cough.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT RESPIRATORY DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Cold Medications		
Guaifenesin (Mucinex®)	Thins respiratory tract mucus.	Nausea, vomiting, drowsiness, headache, rash.
Oxymetazoline (Afrin®)	Nasal spray that relieves nasal congestion.	Burning or stinging in the nose, dryness, sneezing, rebound nasal congestion with prolonged use, tremor, heart palpitations, nervousness.
Dextromethorphan (Robitussin DM®)	Suppresses cough.	Drowsiness, dizziness, stomach upset, constipation.
Pseudoephedrine (Sudafed®)	Decongestant that dries nasal passages.	Fast heart rate, palpitations, elevated blood pressure, insomnia, dizziness, headache.

GASTROINTESTINAL-

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS FOR GASTROINTESTINAL DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Antacids		
Aluminum hydroxide (Amphogel®), Aluminum/magnesium hydroxide (Mylanta®, Maalox®)	Fast acting but short lasting treatment for indigestion and heartburn.	Diarrhea, nausea, mood or mental changes.
Calcium carbonate (Maalox®, TUMS®)	Used to treat indigestion and heartburn.	Headache, constipation, nausea, vomiting, abdominal pain.
Antidiarrheal Agents		
Kaopectate®	Used to treat diarrhea	Constipation
Pepto-Bismol®	Used to treat diarrhea, nausea and indigestion.	Darkening of the tongue, dark (black) stools, constipation, nausea, headache, confusion.
Loperamide (Imodium®)	Used to treat diarrhea.	Drowsiness, dizziness, dry mouth, nausea, constipation, rash.
Diphenoxylate with atropine (Lomotil®)	Used to treat diarrhea.	Drowsiness, dry mouth, constipation, blurred vision, headache, confusion, itching, difficulty breathing.
Antiemetics (antinausea agents)		
Promethazine (Phenergan®), Prochlorperazine (Compazine®)	Used to control nausea and vomiting.	Drowsiness, dry mouth, headache, dizziness, restlessness, muscle ache, sore throat.
Antiulcer Agents		
Cimetidine (Tagamet®), Famotidine (Pepcid®), Nizatidine (Axid®), Ranitidine (Zantac®)	H2 blockers used to decrease acid production in the stomach. Used to treat ulcers, GERD.	Dizziness, agitation, headache, confusion, constipation, diarrhea, nausea, rash, drowsiness.
Lansoprazole (Prevacid®), Dexlansoprazole (Kapidex®), Omeprazole (Prilosec®), Esomeprazole (Nexium®), Pantoprazole (Protonix®), Rabeprazole (Aciphex®)	Proton-pump inhibitors (PPI's) used to decrease stomach acid in the treatment of GERD, ulcers, gastritis.	Headache, dizziness, nausea, diarrhea, constipation, rash, muscle or joint pain.
Sucralfate (Carafate®)	Used to treat ulcers, esophagitis	Constipation, dizziness, gas, headache, rash.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS FOR GASTROINTESTINAL DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Laxatives		
Docusate (Colace®)	Stool softener	Diarrhea, stomach cramping.
Bisacodyl (Dulcolax®), Senna (Senokot®)	Stimulant laxatives used for constipation.	Stomach cramps, nausea, vomiting, diarrhea, dizziness, rectal burning.
Lactulose (Chronulac®)	Used to treat constipation.	Gas, diarrhea, stomach pain, nausea.
Magnesium hydroxide (Milk of Magnesia®)	Used to treat constipation.	Diarrhea, stomach cramping.
Psyllium (Metamucil®)	Bulk-forming laxative.	Stomach pain, bowel obstruction, gas, constipation, and diarrhea.
Polyethylene glycol (MiraLax®, Glycolax®)	Used to treat constipation by reducing water absorption in the colon.	Abdominal bloating, cramping, diarrhea, gas, nausea.
Lubiprostone (Amitiza®)	Used to treat chronic constipation.	Headache, nausea, diarrhea.

ENDOCRINE -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT ENDOCRINE DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Thyroid medications		
Levothyroxine (Synthroid®, Levoxyl®)	T4 agent used as replacement therapy for hypothyroidism (low thyroid levels)	Increased blood pressure, fatigue, fever, headache, insomnia, irritability, weight loss
Liothyronine (Cytomel®)	T3 agent sometimes used to treat hypothyroidism.	Fast heart rate, low blood pressure, allergic skin reactions, fever, elevated blood pressure, twitching.
Thyroid extract (Armour Thyroid®)	Natural thyroid product used to treat hypothyroidism	Elevated blood pressure, change in weight, shakiness, nervousness, diarrhea, irritability, leg cramps, insomnia.
Oral diabetes medications		
Glyburide (Diabeta®, Glynase®), Glipizide (Glucotrol®), Tolazamide (Tolinase®), Chlorpropamide (Diabinese®), Glimepiride (Amaryl®).	Sulfonylurea's used to treat diabetes by stimulating the secretion of insulin from the pancreas.	Rash, itching, constipation, nausea, diarrhea. Monitor for very low blood sugars. Cannot be taken if allergy to sulfa
Metformin (Glucophage®)	A drug used to treat diabetes by reducing blood sugar and helping insulin to work better.	Nausea, diarrhea, weakness.
Acarbose (Precose®), Miglitol (Glyset®)	A drug used to treat diabetes which works by interfering with absorption of carbohydrates in the intestine.	Gas, diarrhea, abdominal pain.
Rosiglitazone (Avandia®), Pioglitazone (Actos®)	A drug used to treat diabetes.	Weight gain, swelling of feet and ankles.
Repaglinide (Prandin®), Nateglinide (Starlix®)	A drug used to treat diabetes. Often used in individuals allergic to sulfa. They are expensive and must be taken several times a day.	Hypoglycemia is common. Also headache, respiratory infection, joint pain, diarrhea, constipation.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS USED TO TREAT ENDOCRINE DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Osteoporosis medications		
Calcitonin (Miacalcin®)	Nasal spray used to treat osteoporosis.	Facial flushing, nausea, diarrhea, nasal irritation. Do not use if allergy to salmon.
Etidronate (Didronel®)	Used to treat osteoporosis.	Fever, bone pain, nausea, diarrhea, rash.
Alendronate (Fosamax®), Risedronate (Actonel®), Ibandronate (Boniva®), Zoledronic acid (Zometa®)	Bisphosphonates used for treatment and prevention of osteoporosis. Zometa® is given in IV form only.	Indigestion, reflux, abdominal pain, nausea, diarrhea, esophageal ulcers, headache, hypertension, rash, joint pain, back pain. Zometa®: swelling, fatigue, fever, anemia, bone pain, shortness of breath, dizziness.
Steroids (oral)		
Prednisone (Deltasone®), Prednisolone (Delta-Cortef®), Methylprednisolone (Medrol®), Dexamethasone (Decadron®)	Used to decrease inflammation associated with arthritis, chronic lung disease, allergic reactions, and other inflammatory diseases.	Nausea, vomiting, indigestion, stomach pain, weight gain, swelling of feet and ankles, menstrual irregularities, mental depression, confusion, puffy face.

GENITO-URINARY -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS FOR GENITOURINARY DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Medications for urinary incontinence		
Oxybutynin (Ditropan®)	Antispasmodic agent used to treat bladder muscle spasms that contribute to urinary incontinence, frequency and urgency.	Dizziness, somnolence, dry mouth, constipation, nausea, headache.
Tolterodine (Detrol®), Fesoterodine (Toviaz®)	Antimuscarinic agent used to treat urinary incontinence	Dry mouth, rash, constipation, dry eyes.
Trospium (Sanctura®)	Antimuscarinic (Anticholinergic) agent that is used to treat overactive bladder.	Dry mouth, fatigue, headache, constipation, fast heart rate.
Solifenacin (VESicare®), Darifenacin (Enablex®)	Antimuscarinic agent used to treat overactive bladder with urinary frequency, urgency and incontinence.	Dry mouth, constipation, headache, fatigue, nausea, dyspepsia.
Urinary tract analgesic		
Phenazopyridine (Pyridium®)	Used for short-term relief of pain and burning due to urinary tract infection.	Headache, dizziness, stomach cramps, rash.
Vaginal products		
Clindamycin (Cleocin®), Metronidazole (MetroGel Vaginal®)	Used to treat bacterial vaginosis or non-specific vaginitis	Rash, itching, diarrhea, stomach upset.
Butoconazole (Femstat®), Clotrimazole (Gyne-Iotrimin®), Miconazole (Monistat®), Tioconazole (Vagistat®), Terconazole (Terazole®)	Intravaginal agents used to treat vaginal candidiasis (vaginal yeast infection)	Abdominal cramps, burning, itching, irritation.

EAR, EYE, & SKIN -

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATIONS FOR EAR, EYE, AND SKIN DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Otic (Ear) Medications		
Benzocaine/Antipyrine (Auralgan®)	Used to relieve pain in ear infections but will not treat the infection itself.	Burning, itching, swelling, redness, rash.
Neomycin/Polymixin/Hydrocortisone (Cortisporin®)	This combination of antibiotics and a steroid is used to treat ear canal infections.	Burning, itching, swelling, redness, rash.
Carbamide Peroxide (Debrox®), Triethanolamine (Ceruminex®)	Used to loosen and remove ear wax.	Rash, itching, redness.
Ophthalmic (eye) medications		
Sulfacetamide (Bleph-10®)	Antibiotic used to treat eye infections. It is a sulfonamide so anyone allergic to sulfa meds will react to this.	Stinging or burning when applied, itching, redness, swelling or eye irritation. Allergic reaction: rash, swelling of the face.
Neomycin/polymixin b /gramicidin (Neosporin®)	Combination of three antibiotics used to treat eye infections.	Stinging or burning when applied, itching, redness, swelling or eye irritation.
Erythromycin ointment, Azithromycin solution (AzaSite®)	Antibiotics used to treat eye infections.	Stinging or burning when applied, itching, redness, swelling or eye irritation.
Prednisolone (PredForte®), Dexamethasone (Decadron®),	Steroids used to treat inflammation in the eye.	Blurred vision, burning or stinging, watering, redness.
Timolol (Timoptic®), Betaxolol (Betoptic®), Levobunolol (Betagan®)	Eye medications in the class of beta blockers that are used to treat glaucoma by reducing the pressure in the eye.	Ocular irritation, dry eyes. Blurred vision, browache. May cause an anaphylactic reaction.
Latanoprost (Xalatan®), Travoprost (Travatan®)	Prostaglandin analogues used to treat glaucoma.	Brown discoloration of iris, lengthening and darkening of eyelashes, irritation, redness, and swelling.
Pilocarpine (Isopto ® carpine)	Cholinergic agonist eye medication used to treat glaucoma.	Headaches, dim vision. Can cause cataracts with long term use.

HEALTH AND MEDICATION ADMINISTRATION MANUAL -
Drug Classification Tables -

MEDICATION FOR EAR, EYE, AND SKIN DISORDERS

EXAMPLES	INDICATION/USE	SIDE EFFECTS
Topical Skin Medications		
Topical antibiotics		
Neomycin/Bacitracin/Polymixin (Neosporin®), Bacitracin/Polymixin (Polysporin®), Bacitracin (Baci-Rx®), Baciguent®),	Topical antibacterial agents used on superficial cuts and abrasions to fight infection. These are over-the counter medications.	Skin rash, redness, swelling.
Mupirocin (Bactroban®), Silver sulfadiazine (Silvadene®), Gentamicin	Prescription topical skin antibacterials. Silvadene® is often used in burns.	Skin redness, swelling, itching, rash.
Clindamycin (Cleocin T®), Erythromycin (Eryderm®)	Topical antibacterials often used to treat acne.	Skin redness, dryness, itching.
Metronidazole (Metrogel®, Metro lotion®)	Topical antibacterial often used to treat acne rosacea.	Burning, dryness, redness, itching, rash, headache, nausea.
Topical antifungals		
Terbinafine (Lamisil®), Clotrimazole (Lotrimin®), Econazole (Spectazole®), Ciclopirox (Loprox®), Miconazole (Monistat-Derm®), Ketoconazole (Nizoral®), Tolnaftate (Tinactin®)	Used in treatment of fungal infections: Tinea cruris (jock itch), tinea corporis (ringworm), tinea pedis (athlete's foot), tinea versicolor (skin infection).	Burning, dryness, stinging, rash, itching, irritation.
Topical acne treatment		
Tretinoin (Retin A®) Adapalene (Differin®)	Topical retinoids used to treat acne	Local irritation, sun sensitivity
Tazarotene (Tazorac®)	Used in treatment of acne.	Photosensitivity, rash, burning or stinging, irritation of skin.
Salicylic acid	Used to treat acne	Burning or irritation, peeling, scaling.
Benzoyl peroxide (Benzac®)	Topical cleanser used to treat acne.	Local irritation, can bleach hair and clothing.

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