Safe Medication Administration and Error Reduction

Medication Category and Classification

Nomenclature:

* **Chemical name:** is the name of the medication determined by its chemical composition.
* **Generic name** is the official or nonproprietary name that is given by the United States Adopted Names Council. Each medication has only one generic name.
* **Trade name** is the brand or proprietary name given by the company that manufacturers the medication. One medication may have multiple trade names.

KNOWLEDGE REQUIRED PRIOR TO MEDICATION ADMINISTRATION	
Medication category/class	Medications may be organized according to pharmacological action, therapeutic use, body system, chemical makeup, and safe use during pregnancy. • For example, lisinopril (Zestril) is classified as an angiotensin-converting enzyme inhibitor (pharmacological action) and an antihypertensive (therapeutic use).
Mechanism of action	This is how the medication produces the desired therapeutic effect. • For example, glipizide (Glucotrol) is an oral hypoglycemic agent that lowers blood glucose levels primarily by stimulating pancreatic islet cells to release insulin.
Therapeutic effect	This is the preferred and expected effect for which the medication is administered to a specific client. One medication may have more than one therapeutic effect. • For example, one client is administered acetaminophen (Tylenol) to lower fever, whereas another client may be administered this medication to relieve pain.
Side effects	These are usually expected and inevitable when a medication is given at a therapeutic dose. • For example, morphine sulfate given for pain relief usually results in constipation. Side effects are usually identified according to body system.
Adverse effects	These are undesired, inadvertent and unexpected dangerous effects of the medication. Adverse effects are usually identified according to body system.
Toxic effects	Medications can have specific risks and manifestations of toxicity. • For example, clients taking digoxin (Lanoxin) should be monitored closely for dysrhythmias, a sign of cardiotoxicity. Hypokalemia places these clients at greater risk for digoxin toxicity.

KNOWLEDGE REQUIRED PRIOR TO MEDICATION ADMINISTRATION	
Medication interactions	Medications can interact with each other resulting in desired or undesired effects. • For example, a desired interaction is the beta-blocker atenolol (Tenormin) used concurrently with the calcium channel blocker nifedipine (Procardia) to prevent reflex tachycardia. Take complete medication history and be knowledgeable of clinically significant interactions.
Precautions/ Contraindications	Medications may be contraindicated for a client with a specific disease or condition. • For example, tetracyclines can stain developing teeth and should not be administered to children under 8 years of age. Some medications should only be used cautiously. • For example, vancomycin (Vancocin) is excreted unchanged in the kidneys and should be used cautiously in clients with renal impairment.
Preparation, dosage, administration	It is important to know any special considerations for preparation, recommended dosages, and how to administer the medication. • For example, morphine sulfate is available in 10 formulations. Oral doses of morphine are generally higher than parenteral doses due to extensive first-pass effect. Clients with chronic, severe pain, as seen with cancer, are generally given oral doses of morphine.
Nursing implications	Know how to monitor therapeutic effects, prevent and treat adverse effects, provide for comfort, and instruct clients in the safe use of medications.

Medication Prescriptions

* Each facility has written policies related to medication orders. Policies include which health care providers can write, receive, and transcribe medication orders.

Types of medication orders

Routine order/standard order

* A routine/standard order is an order that identifies medications that are given on a regular schedule. It may or may not have a termination date. Without a specified termination date, the order will be in effect until the provider discontinues it or the client is discharged.
* Certain medications such as opioids and antibiotics must be reordered within a specified amount of time or will automatically be discontinued.

Single/one-time order

* A single/one-time order is to be given once at a specified time or as soon as possible. For example, a one-time order instructs the nurse to give warfarin (Coumadin) 5 mg PO at 1700.

Stat order

* A stat order is only given once, and it is given immediately. For example, a stat order instructs the nurse to give digoxin 0.125 mg IV bolus stat.

PRN (*pro re nata*, or "as required") order

* A PRN order stipulates at what dosage, what frequency, and under what conditions a medication may be given. The nurse uses clinical judgment to determine the client's need for the medication. For example, a PRN order instructs the nurse to give morphine sulfate 2 mg IV bolus q 1 hr PRN for chest pain.

Standing orders

* Standing orders may be written for specific circumstances and/or for specific units. For example, the critical care unit has standing orders to treat a client with asystole.

Components of a medication order include

* The client's name
* Date and time of order
* Name of medication (may be generic or brand)
* Dosage of medication
* Route of administration
* Time and frequency of medication administration – exact times or number of times per day (dictated by facility policy or specific qualities of the medication).
* Signature of prescribing provider.

Communicating Medication Prescriptions

Origination of Medication Prescriptions

* Medication prescriptions are written on the client's medical record by the provider or a nurse who takes a verbal or telephone prescription from a provider.
* If the nurse writes a medication prescription on the client's medical record, facility policy specifies how much time the provider has in which to sign the prescription (usually 24 hr).
* Medication prescriptions are transcribed to the medication administration record (MAR) by a nurse or other health care provider.

Communicating Medication Prescriptions

Taking a telephone order

* If possible, have a second nurse listen on an extension.
* Ensure that the prescription is complete and correct by reading back to the provider: the client's name, the name of the medication, the dosage, the time to be given, frequency, and route.
* Remind the provider that the prescription must be signed within the specified amount of time.
* Write the prescription in the client's medical record.

Preassessment for Medication Therapy

The following information should be obtained prior to the initiation of medication therapy, and updated as necessary.

Preassessment for Medication Therapy

Health History

* Age
* Diagnosed health problems and current reason for seeking care
* All medications currently being taken (prescription and nonprescription): name, dose, route, and frequency of each medication.
* Any symptoms possibly related to medication therapy
* Use of herbal or "natural" products for medicinal purposes
* Use of caffeine, tobacco, alcohol, and/or street drugs
* Client's understanding of the purpose of the medications
* All known medication and food allergies

Preassessment for Medication Therapy

Physical Examination

* A systemic physical examination provides a baseline to evaluate therapeutic effects of medication therapy and detect possible side and adverse medication effects.

Six Rights of Safe Medication Administration

Right Client

Verify the client's identification each time a medication is given.

* Acceptable identifiers include the client's name, an assigned identification number, telephone number, birth date, or another person-specific identifier.
* Check identification bands for name, identification number, and/or photograph.
* Check for allergies by asking the client, looking for an allergy bracelet, and reviewing the medication administration record.
* Bar code scanners may be used to identify clients.

Right Medication

Correctly interpret the medication order (verify completeness and clarity).

* Read the label three times: when the container is selected, when removing the dose from container, and when the container is replaced.
* Leave unit-dose medication in its package until administration.

Right Time

Give medication on time to maintain consistent therapeutic blood level.

* It is generally acceptable to give the medication 1 hr before or after the scheduled time. However, refer to the drug reference or institution policy for exceptions.

Right Route

* Most common routes of administration are oral, topical, subcutaneous, intramuscular (IM), and intravenous (IV).
* Select the correct preparation for the ordered route (for example, otic vs ophthalmic topical ointment or drops).
* Know how to administer medication safely and correctly.

Right Documentation

* Immediately record pertinent information, including the client's response to the medication.

Additional Considerations

Assessment

* Collect appropriate data before administering medication (for example, checking apical heart rate before giving digitalis preparations).
* Assess the client for physical and psychosocial factors that may affect medication response.

Education

* As part of informed consent, provide accurate information about the medication therapy and its implications (therapeutic response, side/adverse effects).
* To individualize the teaching, determine what the client already knows about the medication, needs to know about the medication, and wants to know about the medication.

Evaluation

* Determine the effectiveness of the medication based on the client's response, as well as the occurrence of side/adverse effects.

Medication Refusal

* Clients have the right to refuse to take a medication.
* Determine the reason for refusal, provide information regarding the risk of refusal, notify the appropriate health care personnel, and document refusal and actions taken.

Resources for medication information

* Nursing drug handbooks
* Pharmacology textbooks
* Professional journals
* *Physicians' Desk Reference* (PDR)
* Professional Web sites

Medication Error Prevention

Common medication errors include:

* Wrong medication or IV fluid
* Incorrect dose or IV rate
* Wrong client, route, or time
* Administration of known allergic medication
* Omission of dose
* Incorrect discontinuation of medication or IV fluid

Use of Abbreviations

Medication errors often occur as a result of misinterpretation of abbreviations. Therefore, the National Coordinating Council for Medication Error Reporting and Prevention recommends that the following abbreviations be written out in full and the abbreviations avoided. The U.S. Pharmacopeia and Institute of Safe Medication Practices endorse the avoidance of abbreviations whenever possible. Most hospitals and nursing care units are adopting this significant change in documentation. NOTE: It is the philosophy of the authors of this textbook to avoid abbreviations whenever possible.

ABBREVIATION	INTENDED MEANING	COMMON ERROR
U	Units	Mistaken for a zero (0), a four (4), or cc.
mcg (μg)	Micrograms	Mistaken for mg (milligrams).
Q.D.	Latin abbreviation for "every day"	The period after the "Q" can be mistaken for an "I" so that a medication is given "QID" (four times daily) instead of once daily.
Q.O.D.	Latin abbreviation for "every other day"	Misinterpreted as "QD" (daily) or QID. If "O" is poorly written it may look like a period or "I."
D/C	Discharge or discontinue	Medications have been prematurely discontinued when D/C (intended to mean "discharge") was misinterpreted as "discontinue" because it was followed by a list of drugs. Use the word "Stop."
HS	Half strength	Misinterpreted as the Latin abbreviation "HS" (hour of sleep).
cc	Cubic centimeters	Mistaken for "U" (units) when written poorly.
AU, AS, AD	Both ears, left ear, right ear	Misinterpreted as the Latin abbreviation "OU" (both eyes), "OS" (left eye), "OD" (right eye). Also, some people forget which is right or left, or both, and which is eye or ear.

Use the nursing process to prevent medication errors

Assessment

Ensure knowledge of the medication to be administered. Use appropriate resources

* Health care providers including nurses, physicians and pharmacists.
* Poison control centers
* Sales representatives from drug companies
* Nursing pharmacology textbooks and drug handbooks
* Physicians' Desk Reference
* Newsletters including *The Medical Letter on Drugs and Therapeutics* (bimonthly) and *Prescriber's Letter* (monthly)
* Professional journals
* Professional Web sites

Assessment

Obtain information about the client's medical diagnoses and conditions related to medication administration such as ability to swallow, allergies, and heart, liver, and/or kidney disorders).

* Identify client allergies.
* Obtain necessary preadministration data (heart rate, blood pressure).
* Omit or delay doses as indicated by the client's condition.

Assessment

* Determine if the medication prescription is complete – to include name of client, date and time, name of medication, dosage, route of administration, time, frequency, and signature of prescribing provider.

Assessment

Interpret the medication prescription accurately.

* The Institute for Safe Medication Practices is a nonprofit organization working to educate health care providers and consumers regarding safe medication practices. Tools have been developed to decrease the risk of medication errors. Go to http://www.ismp.org/ for a complete list.
  - Error-Prone Abbreviation List – Abbreviations that have been associated with a high number of medication errors
  - Confused Medication Name List – Sound alike and lookalike medication names
  - High-Alert Medication List – medications that, if given in error, have a high risk for resulting in significant patient harm

Assessment

* Question the provider if the prescription is unclear or seems inappropriate for the client's condition. Refuse to give a medication if it is believed to be unsafe. Notify the charge nurse or supervisor.

Assessment

* Dosage changes are usually made gradually. Question the provider if abrupt and excessive changes in dosages are made.

Planning

* Identify client outcomes for medication administration.
* Set priorities.

Implementation

* Avoid distractions during medication preparation (poor lighting, ringing phones). Interruptions may increase the risk of error.
* Check the labels for the medication name and concentration. Read labels carefully. Measure doses accurately and double-check high-alert medications, such as insulin and heparin, with a colleague.
* Doses are usually 1 to 2 tablets or one single-dose vial. Question multiple tablets or vials for a single dose.
* Follow the Six Rights of Medication Administration consistently.
* Take the medication administration record (MAR) to the bedside.
* Do not give medications that were prepared by someone else.

Implementation

* Encourage clients to become part of the safety net, teaching them about medications and the importance of proper identification before medications are administered. Omit or delay a dose if the client questions the size of a dose or appearance of a medication.
* Follow correct procedures for all routes of administration.
* Communicate clearly both verbally and in writing.
* Use verbal orders only for emergencies and follow facility protocol for telephone orders.
* Omit or delay doses as indicated by the client's condition, and document and report appropriately.
* Follow all laws and regulations regarding controlled substances when preparing and administering medications. Keep controlled substances in a locked area. Discarding of an excess of a controlled substances should be witnessed by a licensed health care provider.
* Only leave medication at the bedside if allowed by facility policy (for example, topical medication).

Evaluation

* Evaluate client response to a medication and document and report appropriately.
* Recognize side/adverse effects and document and report appropriately.

Evaluation

Report all errors and implement corrective measures immediately.

* Complete an unusual occurrence report within the specified time frame, usually 24 hr. This report should include:
  - The client's identification
  - The time and place of the incident
  - An accurate account of the event
  - Who was notified
  - What actions were taken
  - The signature of the person completing the report
* This report does not become a part of the client's permanent record and the report should not be referenced in another part of the record.