

Supplemental Health Care

Medication Review

Medication Administration Overview:

Being a nurse in the health profession is one of the most exciting careers available. Medication administration is a principle part of the nurse's role and brings with it many responsibilities. The two chief principles of medication administration are triple checking the medication before administration and the "five rights." The five rights are: right medication, right dose/quantity, right route, right time and right patient. Knowledge of the medication's actions, side effects, adverse reactions and proper dose are also important when administering medications.

The nurse dispensing the medication is ultimately held accountable for safe administration. Utilize the appropriate resources when you need clarification of an order. Checking with another nurse, the hospital pharmacist or referencing the PDR/drug reference information available may be indicated. It might also include speaking with the prescribing physician before administering the specific medication in question.

Medications do not always have a predictable reaction when given to a particular patient. A drug effect that occurs, other than what is therapeutically intended, can be called an adverse reaction. For example, post anesthesia patients recovering from ketamine hydrochloride need to be observed for hallucinations and disturbing dreams. Expected adverse reactions are usually known as adverse effects. Hypersensitivity is sometimes used interchangeably with the term drug allergy and is the result of an antigen-antibody immune reaction in the body. An **idiosyncratic reaction** occurs when the medication given reacts in an unusual or unpredictable way from the typical reaction expected. For instance, an elderly patient when given phenobarbital may experience marked excitement. A **synergistic effect** is when the drugs work together to actually potentiate, make greater, the effect of the two drugs. An **antagonistic effect** is when one of the drugs diminishes the expected effectiveness of the other drug.

Antagonists and antidotes are those medications that are administered to combat or reverse the adverse effects of a medication. Common antagonists and antidotes include: vitamin K for coumadin; protamine sulfate for heparin; naloxone for narcotics; flumazenil for benzodiazepines; and deferoxamine mesylate for acute iron intoxication.

The patient's age and general health, as well as pregnancy, liver or renal status, may influence a patient's reaction to medication. For instance, it is essential to assess the patient's ability to produce urine and void before administration of potassium. How a medication is taken also has an effect on its reaction in the body. The absorption of an oral medication may be altered if it is crushed, chewed or swallowed. The absorption rates vary between sublingual, oral, subcutaneous, intramuscular and intravenous medications. The interval between dosing affects the medication's reactions as well. If a patient is taking medications too frequently, at interval shorter than the medication's half-life, toxic serum levels may develop, where as lengthening the time between doses could result in therapeutically low serum levels.

Medications to Review: (*Principles of Administration & Side Effects*)

Cardiovascular System: Calcium Channel Blockers, ACE Inhibitors, Beta Blockers, Antianginals, Antihyperlipidemics, Diuretics, Antihypertensives, Antiarrhythmics

Central Nervous System: Antianxiety, Over-the-Counter, Antipsychotics, Mood disorders, Hypnotics, Sedatives, Anticonvulsants

Endocrine System: Diabetes - Oral Agents and Types of Insulin, Thyroid

Respiratory System: Bronchodilators, Asthmatics, Over-the-Counter Medications, TB Treatment

Infections: Antibiotics, Antibacterials, Antivirals, Antifungals

Pain & Anesthetics: Preoperative Medications, Anesthetics, Conscious Sedation, Narcotics

Anticoagulants and Antithrombolytics: Coumadin, Heparin, Lovenox, Hematological Medications, TPA

Miscellaneous: Vitamin Therapy, Herbal Compounds, Hormone Therapy, Oncologic Medications, Antacids and Reflux

Basic Medication Concept Review

Conversions: 1kg = 2.2 pounds
1gm = 1,000 mg
1mg = 1,000 mcg
1 liter = 1,000 ml
1 tsp = 5 ml
1 ounce = 30 ml or 2 tbsp.
8 ounces = 240 ml

Common Formulas: $\frac{\text{Dose Ordered} \times \text{Quantity Available}}{\text{Dose Available}} = \text{Quantity to Administer}$

$\frac{\text{Dose Ordered} \times \text{Volume on Hand}}{\text{Dose Available}} = \text{Volume to Administer}$

IV Flow Rate (Drops) = $\frac{\text{Drops}}{\text{ml}} \times \frac{\text{ml}}{\text{min}}$ -OR-

IV Flow Rate (Drops) = $\frac{\text{Desired Volume} \times \text{Drops per ml}}{\text{Time in Minutes}}$

Convert mcg/kg/min to ml/hr:

First convert mcg/kg/min to mg/hr: $\frac{(\text{mcg} \times \text{kg}) \times 60}{1000}$

Next using the IV Dosage Formula, solve for the ml/hr: $\frac{\text{Dose Ordered} \times \text{Volume Available}}{\text{Dose Available}} = \text{ml/hr}$

Convert ml/hr to mcg/kg/min:

First determine how many mg/hr is being delivered by the IV pump: $\frac{\text{Rate} \times \text{Dose Available}}{\text{ml available}} = \text{mg/hr}$

Next convert the milligrams/hour to mcg/kg/min: $\frac{\text{mg} \times 1000/\text{kg}}{60 \text{ min}}$

Standard Measurements: Intradermal Needle 26 to 27 gauge X 3/8 inch PPD, Allergens Local Anesthetics
 Subcutaneous 25 to 27 gauge 1/2 to 5/8 inch Epi, insulin, tetanus toxoid, heparin
 Intramuscular Consider patient's muscle mass, age, nutritional status and the viscosity of the medication Analgesics, antibiotics & most meds
 Macrodrop Tubing 10-15 gtt/cc or ml (check manufacturer information)
 Microdrop Tubing 60 gtt/cc or ml (check manufacturer information)

Common Abbreviations:

ac	before meals	IVP	IV push	PO	by mouth
ad lib	freely	IVPB	secondary IV line	pr	by rectum
AM	morning	kg	kilogram	prn	as needed
bid	twice a day	KVO	keep vein open	q	every
c	with	L	liter	qd	every day
caps	capsule	mg	milligram	qh	every hour
cc	cubic centimeter (ml)	mEq	milliequivalent	q4h	every 4 hours
d/c	discontinue, terminate	NKDA	no known drug allergies	qid	four times a day
elix	elixir	NPO	nothing by mouth	qod	every other day
g;gm	gram	OD	right eye	s	without
gtt	drops	OS	left eye	SL	sublingual
h;hr	hour	os	mouth	ss	a half
hs	at bedtime	OTC	over the counter	stat	now, immediately
ID	intra dermal	OU	both eyes	SC	subcutaneous
IM	into a muscle	pc	after meals	tid	three times a day
IV	into a vein	PM	afternoon		

Basic Lab Values (Review Comprehensive Lab Values):

Hct	M - 42 - 52% F - 38 - 46%	Sodium	135 to 145 mEq/L
Hgb	M - 14 - 18 g/dl F - 12 - 16 g/dl	Potassium	3.8 to 5.5 mEq/L
PT	10-14 seconds INR for warfarin therapy 2 to 3	BUN	8 to 20 mg/dl
PTT	25 to 36 seconds	Creatinine	M - 0.8 to 1.2 mg/dl F - 0.6 to 0.9 mg/dl
Platelet	140,000 - 400,000/mm ³	Glucose	70 - 100 mg/dl
WBC	4,100 - 10,900/mm ³	Bilirubin	Direct <0.5 mg/dl Indirect 1.1 mg/dl