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Medication Administration

Nursing Foundation

Principles of medication administration, routes of drug administration, medication rights, dosage calculation, drug safety, documentation and prevention of medication errors.

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CHAPTER 16

CHAPTER 16 Medication Administration

B.Sc. Nursing | Nursing Foundation I & II

Meaning and principles

Medication administration is safe preparation, delivery, monitoring and documentation of authorized medicines. Verify patient with two identifiers; confirm medicine, dose, route, time, indication, assessment, documentation, education and response. Respect right to refuse; clarify ambiguous orders, allergies and contraindications. Check expiry, concentration, compatibility, storage, and relevant observations/labs; follow high-alert independent-check policy.

Routes and injection principles

Route	Description
Oral, sublingual, buccal	Swallowed, under tongue, or between cheek and gum.
Intradermal (ID)	Dermis; typical 5-15 angle.
Subcutaneous (SC)	Subcutaneous tissue; 45 or 90 depending on device/tissue.
Intramuscular (IM)	Muscle; typical 90 angle, site and needle selected for patient and drug.
Intravenous (IV)	Vein; administration rate and dilution are drug-specific.
Topical/transdermal	Skin/mucosa or controlled absorption through skin.
Inhaled, rectal, vaginal	Route-specific preparation and technique.

Common IM sites: deltoid, vastus lateralis, ventrogluteal. Needle length, volume, site and technique depend on age, tissue, drug and protocol. Never improvise IV dilution or rate. Do not crush modified-release or enteric-coated preparations unless verified appropriate.

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Dosage calculations

Required volume = prescribed dose / available dose x available volume. Example: 250 mg ordered, 500 mg/2 mL available -> 1 mL. Infusion rate (mL/hour) = total mL / hours. Gravity drops/min = volume (mL) x tubing drop factor (drops/mL) / time (minutes). Example: 500 mL over 4 hours = 125 mL/hour; with 20 drops/mL tubing, 500 x 20 / 240 42 drops/min. Use actual equipment and verify calculations with order.

1 g = 1,000 mg; 1 mg = 1,000 micrograms; 1 L = 1,000 mL. Use leading zero (0.5 mg) and no unnecessary trailing zero (5 mg, not 5.0 mg). Abbreviations OD, BD/BID, TDS/TID, QID, PRN and STAT may be encountered; specify plain-language frequency and clarify ambiguity. PRN requires defined indication and limits.

Administration workflow and error prevention

Review medication administration record, prepare aseptically, verify identity and allergies at bedside, explain purpose and precautions, administer safely, monitor therapeutic/adverse response, document promptly and dispose sharps appropriately. Reconcile medicines at transitions. Separate look-alike/sound-alike medicines, minimize distractions, use barcode systems and appropriate double checks. Never routinely recap needles.

Adverse reactions and medication errors

Observe rash, hypotension, respiratory distress, sedation and other reactions. Suspected anaphylaxis requires emergency response. After suspected error, assess and protect patient, notify responsible clinician, follow reporting policy, document objective facts and monitor. Do not conceal errors.

Exam revision

1. 1. Explain medication rights, routes and safe administration.
2. 2. Solve dose and infusion calculations.
3. 3. Discuss adverse reactions, errors and prevention.

Reference

WHO. Medication Without Harm. https://www.who.int/initiatives/medication-without-harm/

Educational notes. Clinical skills require supervision, authorized orders and current facility protocols.

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Quick Revision

- Verify identity with two identifiers and check medicine, dose, route, time, indication, assessment and response.

- Clarify ambiguous orders and assess allergies, contraindications, expiry, compatibility and relevant observations.

- Typical ID injections use 5-15 and IM injections 90 ; SC angle depends on device and tissue.

- Required volume equals prescribed dose divided by available dose multiplied by available volume.

- Use a leading zero for doses below one and avoid unnecessary trailing zeros.

- Monitor therapeutic and adverse responses, document promptly and assess, report and monitor after suspected errors.

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Practice questions

Choose one best answer. The answer key and explanations follow the questions.

1. A prescription is for 250 mg and stock contains 500 mg in 2 mL. What volume is required?

A. 0.5 mL

B. 2 mL

C. 4 mL

D. 1 mL

2. Which route places a medication under the tongue?

A. Buccal

B. Sublingual

C. Intradermal

D. Intramuscular

3. Which dose notation follows the stated safe-writing principle?

A. 0.5 mg

B. 5.0 mg

C. .5 mg

D. 0.50 mg

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Answer key and explanations

1. D - 1 mL

250/500 x 2 mL equals 1 mL.

2. B - Sublingual

Sublingual medicines are placed under the tongue.

3. A - 0.5 mg

Use a leading zero and avoid unnecessary trailing zeros.

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