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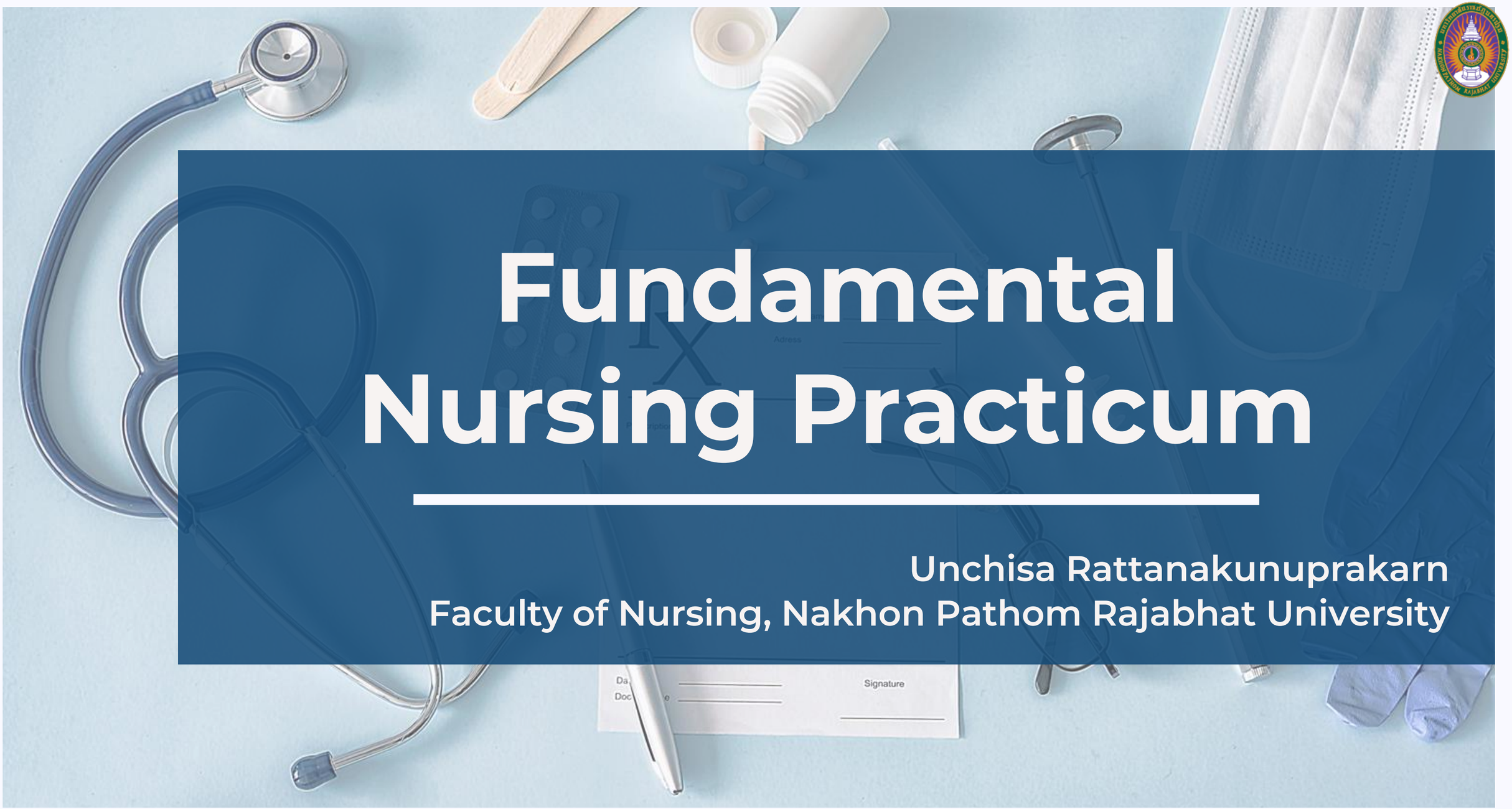

Fundamental Nursing Practicum

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CHAPTER 6

NURSING PRACTICES FOR ADMINISTERING INTRAVENOUS SOLUTIONS AND MEDICATIONS

Objectives

Explain procedures for intravenous solutions and medications

Description

Intravenous (IV) therapy is a critical nursing skill used to deliver fluids, medications, and nutrients directly into a patient’s bloodstream.

Proper administration ensures hydration, electrolyte balance, and medication effectiveness while minimizing complications.

Principles of IV Therapy

Purpose of IV Therapy

1. Maintain or restore **fluid and electrolyte balance**.
2. Provide **continuous or intermittent medication delivery**.
3. Supply **nutrients** (e.g., total parenteral nutrition – TPN).
4. Deliver **blood products** or **chemotherapy**.

Types of IV Solutions : Crystalloids

Principles of IV Therapy

1. **Isotonic (e.g., Normal Saline 0.9%, Lactated Ringer's):**
   Maintains fluid balance.

2. **Hypotonic (e.g., 0.45% NaCl, D5W):**
   Hydrates cells; used for dehydration.

3. **Hypertonic (e.g., D5NS, D10W):**
   Draws fluid into circulation; used for severe hyponatremia.

Types of IV Solutions : Colloids

Principles of IV Therapy

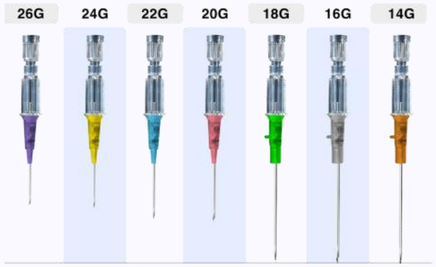
Colloids – Contain larger molecules to increase **osmotic pressure** and expand plasma volume (e.g., albumin, dextran).

IV Administration Equipment

1

IV Catheter

– Peripheral IV (short-term) or Central Venous Catheter.



2

IV Tubing

– Primary (continuous) and Secondary (piggyback) tubing.

3

Infusion Pump or Gravity Drip Set

– Controls the flow rate.

4

Saline Lock– Used for intermittent IV access.

IV Administration Equipment

5

Extension tube

6

3-Way stopcock

7

Transpore

Preparation

1

Verify the Doctor’s Order

– Check the type of solution, rate, and any additives.

2

Assess the Patient

– Consider age, condition, vein integrity, and allergies.

3

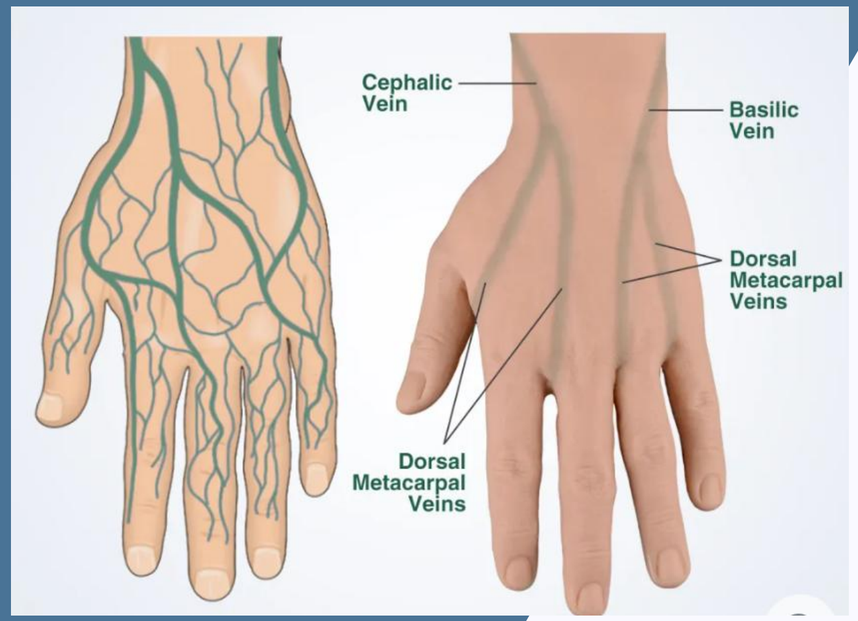
Gather Equipment

– Use sterile technique to prepare IV fluids and tubing.

IV Line Setup & Insertion

1. **Prime the IV tubing** (remove air bubbles to prevent embolism).

2. **Clean the insertion site** with antiseptic (e.g., alcohol, chlorhexidine).



IV Line Setup & Insertion

3

Insert the catheter at a 10-30° angle, then advance the catheter while withdrawing the needle.

4

Secure the IV site with a transparent dressing and label it with the date and time.

Regulating IV Flow Rate

(Sue C. Delaune, Patricia, 2011; Ernstmeyer & Christma, 2021)

1

Manual Drip Rate Calculation:

- **Formula: (Volume in mL × Drip Factor)**
- **÷ Time in minutes =**
- **Drops per minute (gtt/min)**

For example, if 1000 mL is to infuse over 8 hours with a tubing drop factor of 10 drops per milliliter:

$$\frac{1000\ \text{mL}}{8(60)\ \text{min}} \times 10\ \text{drops/mL}$$

$$= \frac{10{,}000\ \text{mL}}{480\ \text{min}} = 20.8 \text{ or } 21\ \text{drops/min}$$

Regulating IV Flow Rate

(Sue C. Delaune, Patricia, 2011; Ernstmeyer & Christma, 2021)

2

Pump Administration: Set the exact rate (mL/hr) per order.

$$\frac{\text{Total volume}}{\text{Number of hours to infuse}} = \text{mL/hour infusion rate}$$

For example, if 1000 mL is to infuse over 8 hours:

$$\frac{1000}{8} = 125 \text{ mL/hour}$$

Monitoring IV Therapy

From Mosby's Textbook for Nursing Assistants. https://navs.npc.edu/nursingassistantvideoskills/index.html?sectionId=3

1. **Check the IV site** for signs of infiltration, phlebitis, or infection.
2. **Assess for fluid overload** (e.g., edema, shortness of breath, high BP).
3. **Ensure proper flow rate** and prevent occlusions.
4. **Change tubing** every **72-96 hours** per facility policy.

IV Complications and Management

Complication	Signs & Symptoms	Management
Infiltration (fluid leaks into tissue)	Swelling, cool skin, pallor	Stop IV, elevate limb, apply warm compress
Phlebitis (vein inflammation)	Redness, warmth, pain	Stop IV, apply warm compress, document
Extravasation (vesicant drug leaks into tissue)	Pain, burning, necrosis	Stop IV, notify provider, administer antidote if available
Air Embolism	Chest pain, dyspnea, hypotension	Trendelenburg position, oxygen, call for help
Fluid Overload	Hypertension, crackles in lungs, edema	Slow IV rate, elevate head, diuretics if needed

(Sue C. Delaune, Patricia, 2011; Ernstmeyer & Christma, 2021)

KEY CONCEPTS

Nursing interventions that **promote the resolution of alterations in fluid balance** are based on the principles of client safety and standards of care.

Following institutional protocol and established procedures for IV therapy helps ensure client safety.

Clients receiving intravenous therapy require **constant monitoring for complications.**

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