



សាកលវិទ្យាល័យ ពុទ្ធិសាស្ត្រ

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ការលែតំរួចជំណក់សេរួម

Regulating Intravenous flow Rate

វត្តបំណង / Objectives

➤ **នៅចុងបញ្ចប់នៃមេរៀននេះ និស្សិតទាំងអស់នឹងអាច:**

1. Overview of regulating intravenous flow rate
2. Explanation how to perform of nursing process 5 steps: Assessment, Nursing Diagnosis, Planning, Implementation, and Evaluation
3. Demonstration how to prepare the material for the procedure
4. Demonstration how to perform the procedure

១. ទស្សនៈទូទៅនៃលក្ខណៈសំខាន់ៗស្រប

After initiating an infusion and ensuring that the line is patent, regulate the rate of infusion according to the health care provider's order. Accurate infusion rates are essential in the delivery of solutions and medications. Appropriate regulation of fluid rates reduces complications (e.g., phlebitis, infiltration, fluid overload, or clotting of the VAD) associated with IV therapy. Changes in patient position, flexion of the IV site extremity, and occlusion of the IV device influence rates. Vasospasm of the vein, venous trauma, or manipulation of the device also affects infusion rates.

There are a variety of methods for calculating infusion rates:

- A. Electronic infusion devices (EIDs): maintain correct flow rates and catheter patency and prevent an unexpected bolus of IV infusion.
- B. Non-EIDs such as a volume-control device deliver small fluid volumes with aid of gravity.



Equipment

- Watch with second hand
- Calculator
- Paper and pencil
- Tape
- Label
- IV administration set: EID (optional), volume-control device (optional)



២. ការប៉ាន់ប្រមាណការថែទាំ / Assessment

- 1) Review accuracy and completeness of health care provider order in patient's medical record for patient name and correct solution: type, volume, additive, rate, and duration of IV therapy. Follow 10rights of drug administration
- 2) Assess patient's knowledge of how positioning of IV site affects flow rate.
- 3) Perform hand hygiene. Inspect IV site for signs and symptoms of IV-related complications such as pain, swelling, or redness.
- 4) Observe for patency of IV tubing and VAD.
- 5) Identify pt risk for fluid and electrolyte imbalance, given type of IV fluid (e.g., neonate, history of cardiac or renal disease).

៣. រោគវិនិច្ឆ័យថែទាំ / Nursing Diagnosis

- Deficient fluid volume
- Risk for infection
- Excess fluid volume
- Risk for injury

Related factors are individualized based on patient's condition or needs

៤. ផែនការថែទាំ / Nursing Planning

Expected outcomes following completion of procedure:

- Serum electrolyte levels remain within normal limits.
- Patient receives prescribed volume of solution over desired time interval
- No signs or symptoms of IV-related complications (e.g., infiltration, infection).

៥. ការអនុវត្តន៍ថែទាំ / Implementation

1. Identify patient using two identifiers (i.e., name and birthday or name and account number)
2. Have paper & pencil or calculator to calculate flow rate.
3. Know calibration (drop factor) in drops per milliliter (gtt/ml) of infusion set used by agency:
4. Microdrip: 60gtt/ml: Used to deliver rates less than 100 ml/hr
5. Macrodrip: 10 to 20 gtt/ml (depending on manufacturer): Used to deliver rates greater than 100ml/hr.

4. Determine how long each liter of fluid should run. Calculate milliliters per hour (hourly rate) by dividing volume by hours:

$$\text{ml/hr} = \frac{\text{Total infusion (ml)}}{\text{Hours of infusion}}$$
$$1000 \text{ ml}/8\text{hr} = 125\text{ml/hr}$$

or if 3L is ordered for 24 hours:
 $3000 \text{ ml}/24\text{hr} = 125 \text{ ml/hr}$

5. Select one of the following formulas to calculate minute flow rate (drops per minute) based on drop factor of infusion set:

$$\text{a) ml/hr}/60\text{min} = \text{ml/min}$$

$$\text{Drop factor} \times \text{ml/min} = \text{Drops/min}$$

or

$$\text{b) ml/hr} \times \text{Drop factor}/60 \text{ min} = \text{Drops/min}$$

Calculate minute flow rate for a bag1: 1000ml with 20 mEq KCL @ 125ml/hr.

Microdrop: $125\text{ml/hr} \times 60 \text{ gtt/mL} = 7500 \text{ gtt/hr}$

$$7500 \text{ gtt} \div 60 \text{ minutes} = 125 \text{ gtt/min}$$

Macrodrop: $125\text{ml/hr} \times 15 \text{ gtt/mL} = 1875 \text{ gtt/hr}$

$$1875 \text{ gtt} \div 60 \text{ minutes} = 31 \text{ to } 32 \text{ gtt/min}$$

- A. For gravity infusion: confirm hourly rate and minute rate based on drop factor of infusion set. Using formula (see step 5) calculate flow rate.
- a. Ensure that IV container is 36 inches above the IV site for adult.
 - b. Regulate flow rate by counting drops in drip chamber for 1 min by watch; adjust roller clamp to increase or decrease rate of infusion.



7. For use of EID for infusion: Follow manufacture guidelines for setup of EID.
 - a. Insert IV tubing into chamber of control mechanism
 - b. Turn on power button, select required drops per min volume per hour, close door to control chamber, and press start button
 - c. Monitor infusion rate and IV site for complications according to agency policy. Use watch to verify rate of infusion, even when using EID.
 - d. Assess patency of system when alarm signals.



9. Attach label to IV fluid container with date and time container changed (checked agency policy)
10. Instruct patient in purpose of alarms, to avoid raising hand or arm that affects flow rate, and to avoid touching control clamp.

៦. ការវាយតម្លៃថែទាំ / Evaluation

- 1) Monitor IV infusion at least every hour, noting volume of IV fluid infused and rate.
- 2) Observe patient for signs of fluid volume excess or deficit and signs of fluid and electrolyte imbalance.
- 3) Evaluate for signs of IV-related complication (e.g., infiltration, phlebitis, occluded venous access device [VAD], kink or knot in infusion tubing).

Unexpected Outcome

1. Sudden infusion of large volume of solution occurs with patient having symptoms of dyspnea, crackles in lung, and increased urine output, indicating fluid overload.
2. IV fluid container empties with subsequent loss of IV line patency.
3. IV infusion is slower than ordered.

Related Intervention

- Slow infusion rate: KVO rate
- Notify health care provider immediately
- Place patient in high-fowler position
- Anticipate new IV ordered
- Administer diuretics if ordered.
- Discontinue present IV and restart new short peripheral catheter in new site
- Check for positional change that affects rate, height of IV container, kinking of tubing or obstruction
- Check VAD site for complications.
- Consult health care provider for new order to provide necessary fluid volume

៧. ការកត់ត្រា និង រាយការណ៍ / Recording & Reporting

- Record rate of infusion in drops per minute or milliliters per hour in nurse's noted or on parenteral administration form according to agency policy
- Document use of any EID or control device and identification number on that device.
- At change of shift or when leaving on break, report rate of and volume left in infusion to nurse in charge or next nurse assigned to care for patient.

Reference

PERRY & POTTER (2008). Clinical Nursing Skill and Techniques, 8th Edition. Elsevier MOSBY, St. Louis, Missouri. Page 708-713.

