Advances Infusion Technology VS Excellent Nursing Practice

Pongpak Pittayapan. R.N, DNSc.
Cert.in IV Therapy and Oncology Nursing. UK.

content

- อุปกรณ์ในการให้ยาและสารน้ำและแนวทางการจัดการ
- เทคโนโลยีในการป้องกันความคลาดเคลื่อนในการให้ยาและสารน้ำ
- ดัชนีชีวัดความเป็นเลิศในการพยาบาลผู้ป่วยที่ได้รับสารน้ำทางหลอดเลือดดำ
- สรุป

Equipments

- Solution container
  - Material
  - Sizes
  - Types of containers

Clinical Considerations

1. Wash hands before opening or spiking solution containers
2. Inspect bags and bottles before use for cracks, leaks, damaged ports or seals, expiration date, clarity, discoloration, turbidity, and particulate matter; discard if problems found
3. Label bags and bottles with date and time the solution container was opened

Clinical Considerations

5. Change solution containers in accordance with the *Infusion Nursing Standards of Practice* (Intravenous Nurses Society [INS], 2000), particularly if a closed system is not maintained, to prevent the potential growth of microorganisms that might have entered the system
6. Discard solution containers removed from the intravenous system; do not save for later use

Administration set

- Types
- Drop factor
- Construction
- Internal administration set diameter
- Clamps
- Injection/access ports
- Considerations When Using Administration Sets

Considerations When Using Administration Sets

1. Assess product and package integrity before use; do not use if violated
2. Assess patient for latex sensitive; some administration sets contain parts with latex
3. Determine appropriateness of administration set based on medication/solution to be administered
   a. Certain medications, such as Taxol, must be given through administration sets not made of polyvinyl chloride (PVC)
   b. Administration sets used to administer other medications such as propofol should be replaced every 6 to 12 hours or according to manufacture's recommendations

4. Change peripheral and central primary and secondary administration sets in accordance with the Infusion Nursing standards of practice (INS, 2000) and organizational policies and procedures
5. Change administration sets at the time of the peripheral catheter change or when a new solution container is initiated

6. Discard administration sets used to administer lipid emulsions after each unit unless additional units are administered consecutively and immediately if contamination is suspected or product integrity is compromised; change sets used to administer consecutive units every 24 hours
7. Change administration sets used to administer blood and blood products after each unit or at the end of 4 hours, whichever comes first, and immediately if contamination is suspected or product integrity is compromised

Add-On and Junction Securement device

- Extension Sets
- Stopcocks
- Connectors
- Securement Devices
- Injection/Access Ports
- Solid Caps
- Vented Spike Adapters
- Transducers and Domes

Filters

- Features
- Types
- Structural Configuration
- Surface Area
- Pressure Limitations
- Indications for Use

Needles/ Catheters

- Catheters
- Needles
- Peripheral Catheters
- Central Vascular Access Devices
- Implanted Ports
- Spinal Catheters
- Therapy-Specific

Flow-control devices

- Electronic Infusion Devices
- Mechanical Infusion Devices
- Implanted Pumps
- Mechanisms of Delivery
- Indication for Use
- Features

Selection of device

a. safety features: prime consideration
   1) Automatic anti-free flow is essential (when door is open or administration set is removed, fluid flow is stopped by a mechanical clump usually initiated at the time the door is opened)
   2) Guardrails that set dosage limits for the administration of medication can prevent serious medication errors at the bedside
   3) Audible alarms
   4) Appropriate grounding to prevent electrical hazards and interference from other electrical equipment
   5) Features to minimize tampering
   6) Delivery rate within 3% to 5% accuracy

Risk Factors

- Human Error
  - Related with using medicine
  - Related with using infusion pump
- Infusion devices/ Infusion pump
  - General pump
  - Patient-controlled analgesia (PCA)

(Medical center's Safe Medication Administration Committee)

Med Errs and Factor associated

- A significant percentage of medical errors are medication-related
- these errors account for 1 of 131 outpatient and 1 of 854 inpatient deaths
- include prescription and pharmacy-dispensing errors
- unintentional noncompliance with medication instructions
- infusion device account for up to 35 % of all medication error

High Alert Medication

- Definition: are medications that have a high potential to have serious consequences if involved in a medication error.
- Institute for Safe Medication Practices, the following high-risk medications are
  - Chemotherapy
  - Insulin
  - Opiates
  - All concentrated electrolyte solutions
  - IV heparin, anticoagulants

Technology to reduce the potential for error

- Computerized prescribe order enter (CPOE)
- Chemotherapy-specific software programs
- Computerized nursing documentation systems with links to pharmacology references

- Automated medication-dispensing machines
- Electronic medical records
- Linked networks of patient database
- Computerized clinical decision support systems

- personal data assistants
- robots in pharmacies
- bar coding
  - FDA "Bar Code Label Requirements for Human Drug Products and biological Products"

- estimate will reduce the risk that a patient will receive the wrong medication or wrong dose or that wrong patient will receive a medication (FDA, 2004 a)
- FDA estimate Bar code rule will reduce 50 % reduction in medication error or 500,000 med –ass-adverse events

R & D in Technology to reduce error

- CPOE reduces medication errors and adverse drug event in general medicine (Bates et al., 1998, 1999; Raschke et al., 1998)

- Automate and computerized systems do not eliminate the potential for error, which can occur from the number of causes, including
  - Stress
  - Fatigue
  - Complacency
  - Distraction and
  - Memory lapses

  (Perry, 2004; Reason, 2000)

- Multicenter study of 3,481 COPE
  - Physicians overload 91.2 % of drug allergy
  - 89.4 % of high severity of drug interaction
- Despite the use of an automate prescribing system, a patient received a cisplatin dose of 760 mg instead of 190 mg, cause
  - severe pancytopenia
  - Renal failure → hemodialysis

Strategie 1

- Consistently use a reliable method to verify patient identify prior to chemotherapy administration.

Patient Safety Standards
Eevidence-based recommendations

1. Improve the accuracy of patient identification

1.1 use at least 2 patient identifiers when giving medications. Neither identifier may be the patient's room number.

1.2 Proper identifiers are the patient's name, telephone number, and date of birth.

Recommend

- HCP should develop a standard patient identification policy for use in their institution and consistently adhere to it (Parisi, 2003)

Strategie 2

- Measure height and weight in centimeters and kilograms

Strategie 3

- Have good light, employ magnification, and use high-visibility tools such as calculators with large-number buttons and large lighted data display area

Ageing VS Nurse's Role in Chemotherapy

- Aging process decrease the amount of light entering the eye
- Decrease visual acuity and the ability to discern light or dark contrast and color intensity
- The nurse's role in chemotherapy administration is visually demanding, and good lighting is needed to
  - review orders
  - Read vial or drug labels
  - Prepare medications
  - Enter information into computer

Strategie 4

- Organize the work and workspace for safety and efficiency

IOM' report

- Keeping Patients Safe: Transforming the work environment of nurse
  - Outlined a blueprint of safety promotion actions that include designing the workplace with both nurses and patient in mind
  - Using competent and capable nurse to provide patient care, and creating & sustaining an organizational culture of safety.

Oncology Nursing Transforming Leadership

- Examining the workload and work flow to make patient scheduling or nurse staffing adjustments
- Using strategies or resources to maximize time efficiency
  - Group chemotherapy education classes
  - Instructional videotapes or computerized programs)

Oncology Nursing Transforming Leadership

- Providing comprehensive new staff orientation and training
- Fostering an atmosphere where safety is the number-one goal

Strategie 5

- If chemotherapy orders are transmitted via fax machine, use an original order sheet printed with a font larger than 12 points

Strategie 6

- Eliminate the use of abbreviations and acronyms in all clinical documentation

Patient Safety Standards
Eevidence-based recommendations

2. Improve the effectiveness of communication among caregivers.

2.2 Also, organizations must use a standardized set of abbreviations, acronyms, and symbols throughout the organization, and must also identify those abbreviations that will not be used.

Strategie 7

- Provide and use up-to-date, easily accessible information at the point of care

Strategies 8

- Follow the 80/20 rule

The principle of 80/20 rule (Reh,2002)

- The 80/20 rule origin in economics
- The principle
  - 20 % of something is responsible for 80 % of the result
- Using this principle in product or device evaluations for instance
  - A small number of defects will cause the majority of problem

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Strategies 9

- Reduce the potential for human error

Strategies 10

- Include the stakeholder with the most to lose-the patient-in chemotherapy error prevention efforts.

Strategies 10

- Partnering with patients to prevent chemotherapy errors
- Verifying chemotherapy
- Writing instructions and reiterate chemotherapy teaching
- Create a process to ensure that all patients are given information about their chemotherapy treatments
- Ongoing reinforcement of information may be haphazard

Strategies 10

- Near-miss chemotherapy errors have been caught by patients when they observe something out of the ordinary
  - A larger than usual infusion bag
  - Chemotherapy drug of a difference color than those previously receive
- Encouraged pt to speak up

Strategies 10

- Promptly investigate pt's concerns
- Well-informed patients have much to contribute to chemotherapy error prevention

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- ความปลอดภัยของผู้ป่วย
- ความพึงพอใจของผู้ป่วย
- ความปลอดภัยของบุคลากร
- การบริหารทรัพยากรอย่างเหมาะสม

Prevention and Reporting of Medical Errors (ONS)

- 1) published a peer education newsletter analyzing research related to medication errors,
- 2) developed and circulated a poster on medication errors that included a post-test for staff to complete,
- 3) participated in an institution wide symposium focusing on the fundamentals of dealing with medical errors,
- 4) utilized ONS educational activities and offerings addressing medication errors, and
- 5) confirmed that all medication-related policies and standards of practice are current with research findings

multi-disciplinary hospital wide activities related to processes

- identifying and reviewing medication errors in a non-punitive setting,
- ensuring safety and efficacy of equipment, and
- systems for analyzing medication errors are ongoing. The post-test results will be used as one mechanism for evaluation of the program

- The post-test results will be used as one mechanism for evaluation of the program. Ongoing evaluation, critical to insuring sustained improvement, is discussed using a standardized performance improvement model (FOCUS-PDCA)

- The focus on medication errors by the RUC in conjunction with hospital-wide interest has been an important step aimed at helping oncology nurses to understand their pivotal role in the reporting, analyzing, and prevention of medication errors, and safeguarding the outcomes of those entrusted to their care.