AOS #03 IV
(Revised 6/2005, 9/2006 and 4/2008)

KENTUCKY BOARD OF NURSING
312 Whittington Parkway, Suite 300
Louisville, Kentucky 40222-5172
http://kbn.ky.gov

ADVISORY OPINION STATEMENT

ROLES OF NURSES IN INTRAVENOUS THERAPY PRACTICE

UPDATE AND HISTORY

Effective September 15, 2004, (and revised September 1, 2006) the Kentucky Board of Nursing promulgated Kentucky Administrative Regulation (KAR) 201 KAR 20:490 Licensed practical nurse intravenous therapy scope of practice, which is available on the Board's website at http://kbn.ky.gov

The KAR expands the scope of licensed practical nursing practice in administration of intravenous therapy (IVT) and requires the licensed practical nurse to complete an educational program as specified in Section 2 of the regulation, and to have specific supervision in select situations as specified in Section 3 of the regulation. Pre-licensure practical nurse educational programs have revised their curriculums to prepare students, enrolled after September 15, 2004, to perform the functions listed in the new regulation. Educational programs (as delineated in Section 2 of the regulation) are also being developed for preparation of currently practicing LPNs to acquire the additional knowledge and develop new skills needed to perform the expanded acts.

Since the early 1980's the Board of Nursing has issued from time to time various revisions to this advisory opinion statement that have expanded the scope of licensed practical nursing practice in the performance of IVT, for example:

1976 - 1983	Issued responses to individual questions on LPN/IVT. Much discussion on educational preparation and roles of RN and LPN. (1980-1982 only RNs administer IVT)
1984	Issued AOS to include LPN performance of venipuncture and hanging fluids administered via peripheral routes
1989	Revised AOS to include LPN administration of premixed, pre-labeled IV medications and fluids via piggyback or intermittent peripheral vascular access devices/systems that are given on a routine reoccurring basis to stable patients, after completion of a Board approved post-licensure basic course. Also added role of LPN in assisting RN with select acts for administration of central line infusions
1992	Revised AOS to include LPN peripheral administration using volumetric control devices such as a "soluset, " and patient controlled administration systems
1993	Discontinued Board approval of post basic courses and issued recommendation for standards to be included in pre-licensure and continuing education IVT LPN courses
1994	Since 1994 graduates of pre-licensure practical nursing education programs in Kentucky have had basic IVT preparation
2000 - 2003	Revisions to AOS as contained herein, and study leading to the promulgation of the KAR governing LPN IVT practice
2004	KAR expanded LPN role to include the administration of select classification of IV medications via push or bolus routes, administration of blood and blood components, withdrawal of blood specimens via central line access devices, and IVT via all types of central lines devices, except as limited and under supervision as stated in the KAR. Students entering KY PN programs after September 15, 2004 receive educational preparation for the LPN IVT role delineated in the KAR

2006	KAR revised for clarification and change in scope of practice. The revisions restrict the LPN from inserting a non-coring needle into an implanted port, and permit the LPN to titrate intravenous analgesic medication for hospice patients. See the KBN website for the entire regulation.

The KAR carries the force and effect of law, where as the advisory opinion statements do not. Subsequently, if an LPN has not completed the educational program specified in Section 2 of the regulation preparing the LPN to perform the expanded acts, then the LPN may not perform the those acts. If the LPN has not completed the educational program, but has previously acquired the requisite education and clinical competency to perform those acts contained in this Advisory Opinion Statement, then the LPN may continue to practice under the guidelines issued in this Advisory Opinion Statement.

Should you have any questions, please contact the Nursing Practice Consultant, at the KBN office, at 502-429-3307, or 1-800-305-2042.

ADVISORY OPINION STATEMENT: ROLES OF NURSES IN INTRAVENOUS THERAPY PRACTICE

Numerous inquiries have been received by the Board requesting an opinion on the role and scope of nursing practice in intravenous therapy/procedures. In order to address these inquiries, the Board, through the Practice Committee, researched this issue by extensively reviewing standards of nursing practice, curricula of Board approved nursing education programs in the Commonwealth, and laws governing nursing practice. In 1983, the Kentucky Board of Nursing issued an opinion statement on the roles of nurses in intravenous therapy practice, and subsequently in 1989 and 1999, revised the opinion statement.

STATUTORY DEFINITION AND POLICY

KRS 314.011(6) defines "registered nursing practice" as:

> ...The performance of acts requiring substantial specialized knowledge, judgment, and nursing skill based upon the principles of psychological, biological, physical, and social sciences in the application of the nursing process in:
>
> a) The care, counsel, and health teaching of the ill, injured or infirm.
>
> b) The maintenance of health or prevention of illness of others.
>
> c) The administration of medication and treatment as prescribed by physician, physician assistant, dentist, or advanced registered nurse practitioner and as further authorized or limited by the board, and which are consistent either with American Nurses' Association Standards of Practice or with Standards of Practice established by nationally accepted organizations of registered nurses. Components of medication administration include, but are not limited to:
>
> 1. Preparing and giving medication in the prescribed dosage, route, and frequency, including dispensing medications only as defined in subsection (17)(b) of this section;
> 2. Observing, recording, and reporting desired effects, untoward reactions, and side effects of drug therapy;
> 3. Intervening when emergency care is required as a result of drug therapy;
> 4. Recognizing accepted prescribing limits and reporting deviations to the prescribing individual;
> 5. Recognizing drug incompatibilities and reporting interactions or potential interactions to the prescribing individual; and
> 6. Instructing an individual regarding medications.

d) The supervision, teaching of, and delegation to other personnel in the performance of activities relating to nursing care.

e) The performance of other nursing acts which are authorized or limited by the board, and which are consistent either with American Nurses' Association Standards of Practice or with Standards of Practice established by nationally accepted organizations of registered nurses.

KRS 314.011(10) defines "licensed practical nursing practice" as:

...The performance of acts requiring knowledge and skill such as are taught or acquired in approved schools for practical nursing in:

a) The observing and caring for the ill, injured, or infirm under the direction of a registered nurse, a licensed physician, or dentist.

b) The giving of counsel and applying procedures to safeguard life and health, as defined and authorized by the board.

c) The administration of medication or treatment as authorized by a physician, physician assistant, dentist, or advanced registered nurse practitioner and as further authorized or limited by the board which is consistent with the National Federation of Licensed Practical Nurses or with Standards of Practice established by nationally accepted organizations of licensed practical nurses.

d) Teaching, supervising, and delegating except as limited by the board.

e) The performance of other nursing acts, which are authorized, or limited by the board and which are consistent with the National Federation of Licensed Practical Nurses' Standards of Practice or with Standards of Practice established by nationally accepted organizations of licensed practical nurses.

KRS 314.011(12) "Continuing education" shall mean offerings beyond the basic nursing program that present specific content planned and evaluated to meet competency based behavioral objectives, which develop new skills and upgrade knowledge.

KRS 314.021(2) holds all nurses responsible and accountable for making decisions that are based upon the individual's educational preparation and experience in nursing.

KRS 314.011(2) defines "delegation" as:

... Directing a competent person to perform a selected nursing activity or task in a selected situation under the nurse's supervision and pursuant to administrative regulations promulgated by the board in accordance with the provisions of KRS Chapter 13A.

EDUCATION AND COMPETENCE REQUIREMENTS

Acts which are within the permissible scope of practice for a given licensure level may be performed only by those licensees who personally possess the education and experience to perform those acts safely and competently.

The licensed practical nurse who performs specified intravenous therapy procedures as authorized or limited by the Board should have completed either: 1) a prelicensure practical nurse education program which includes intravenous therapy practice components; or 2) a post-licensure basic intravenous therapy continuing education course. (Since 1994, graduates of Kentucky practical nurse education programs will have completed basic intravenous therapy practice components as a part of their prelicensure education).

The Kentucky Board of Nursing has developed recommended course content to be included in any basic intravenous therapy course for licensed practical nurses. (See Attachment 1)

DIRECTION[1], DELEGATION[2], AND SUPERVISION[3] COMPONENTS

The licensed practical nurse performs specified intravenous therapy procedures under the direction of an RN, physician, or dentist, and/or as delegated by the RN. The registered nurse is responsible and accountable for assuring that all nursing care a patient receives under his/her direction is provided in a safe and competent manner.

The registered nurse is responsible and accountable for the administration and nursing management of intravenous therapy. The registered nurse may delegate selected activities associated with the administration and management of intravenous therapy to a licensed practical nurse qualified by education and experience. The delegation of these activities is based upon the registered nurse's judgment, policy and procedure of the institution, standards of nursing practice established in KRS Chapter 314, and guidelines established in this advisory opinion statement.

The registered nurse is responsible and accountable for providing appropriate supervision and delegation of procedures to the licensed practical nurse who performs intravenous therapy procedures. The licensed practical nurse is accountable and responsible for safe performance of the delegated activities. The registered nurse and licensed practical nurse work collaboratively to assure safe, competent delivery of intravenous therapy practice.

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1 "Direction" means communication of a plan of care, which is based upon assessment of the patient by the registered nurse, physician, or dentist that establishes the parameters for provision of care or for the performance of the procedure. The registered nurse, physician or dentist is available to assess and evaluate patient response(s).

2 "Delegated/Delegation" for the purpose of this statement includes the appropriate assignment of procedures to qualified nursing personnel. The registered nurse remains accountable for delegation of procedures to others.

3 "Supervision" means the provision of guidance by a qualified nurse for the accomplishment of a nursing task with periodic observation and evaluation of the performance of the task including validation that the nursing task has been performed according to established standards of practice.

The degree of supervision required of a licensed practical nurse who performs intravenous therapy procedures is determined by the registered nurse after evaluation of the following factors:

1. The kinds of procedures being performed.
2. The condition of the patient.
3. Preparation and experience of the licensee.
4. The ability of the licensee to recognize adverse reactions and the ability to take appropriate action.
5. The proximity and availability of the registered nurse.

INSTITUTIONAL POLICY

In the performance of procedures in a health care facility, nurses should follow the policies and procedures of the facility, which are consistent with KRS Chapter 314.

ADVISORY OPINION

In accordance with KRS Chapter 314 and after study of the issue, it was the opinion of the Board that the practice of the registered nurse and the licensed practical nurse be guided as described in this statement.

LPN ROLE

Based upon the knowledge and skills acquired in a Board approved prelicensure practical nursing education program, it is within the scope of licensed practical nursing practice to perform the following procedures under the direction of a registered nurse, physician or dentist:

1. Perform calculation and adjust flow rate.
2. Observe and report subjective and objective signs of adverse reactions to any IV administration and initiate emergency interventions.
3. For all IV access devices:
   (a) Administration of IV fluids and medications via central venous and short peripheral access devices as permitted by 201 KAR 20:490 Section 5(3) except as prohibited by 201 KAR 20:490 Section 6;
   (b) Performance of site care and maintenance that includes:
      1. Monitor access site and infusion equipment;
      2. Change administration set, including add-on device and tubing;
      3. Flushing; and
      4. Change site dressing;
   (c) Discontinuance of a medication or fluid infusion; and
   (d) Conversion of a continuous infusion to an intermittent infusion.
4. Insertion or removal of a short peripheral access device

When delegated by a registered nurse, the licensed practical nurse may administer IV medications and fluids that are:

a. Mixed and labeled by a registered nurse, ARNP, physician, dentist, pharmacist or are commercially prepared; and

b. Given on a routine reoccurring basis to a patient with a stable condition.

Such medications and fluids may include electrolytes; vitamins; antibiotics; antiemetics; heparin flush[4]; parenteral nutrition and fat emulsions; and medications via patient controlled administration systems, but may not include the performance of any IV Therapy procedure noted in the "RN Role".

The Board has further clarified this advisory opinion to address specific procedures in intravenous therapy practice by licensed practical nurses to include the following:

1. Upon direction of the registered nurse, physician or dentist, the qualified licensed practical nurse may administer peripheral intravenous medications via a "soluset" when the soluset is used as a volumetric control device, and not as a form of IV push or bolus administration April 1992).

2. When delegated by the registered nurse, a qualified licensed practical nurse may initiate a patient controlled administration system. The registered nurse must exercise prudent judgment in determining whether to delegate the act to the licensed practical nurse. In addition, the recommended intravenous therapy course content allows for inclusion of related content in the curriculum (April 1992).

3. Licensed practical nurses, qualified by the necessary education, experience and current clinical competence, may administer intravenous medications/solutions via a "ready to mix" intravenous solution infusion system (such as the MINI-BAG PLUS system) (April 1998).

Note: LPNs who provide dialysis care may:

- Cannulate and perform dialysis treatment via an implanted subcutaneous vascular device, and/or peripheral access sites (AV fistulas and AV grafts).
- Administer heparin 1:1000 units or less concentration either to prime the pump, initiate treatment, and/or for administration throughout the treatment, in an amount determined by physician approved protocol. The LPN may not administer heparin in concentrations of greater than 1:1000 units.
- Administer normal saline via the dialysis machine to correct dialysis induced hypotension based upon pre-approved medical protocol. Amounts beyond that established in the protocol may be administered only as directed by an RN or physician.
- Obtain/Draw blood specimens from dialysis tubing connected to central line dialysis sites.
- Provide dialysis care in accordance with Advisory Opinion Statement #21 entitled, "Roles of Nurses and Technicians in Dialysis."

Upon direction of the registered nurse, physician, or dentist, the licensed practical nurse, qualified by education, experience, and current clinical competence, may perform select intravenous therapy procedures as identified in the following sections:

A. PERIPHERAL CATHETERS (SHORT – THREE INCHES OR LESS):

1. Initiate and discontinue the administration of IV fluids and/or medications given via a peripheral route including:

    a. Noting the physician's order.
    b. Preparing the administration equipment.
    c. Selecting the type of needle or catheter.
    d. Selecting and preparing the insertion site.

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4 "Heparin flush" means a dose of heparin used to maintain patency of an intermittent vascular access device when the drug does not alter a patient's clotting factor and is considered a nontherapeutic dose.

e. Performing the venipuncture.
f. Securing the device and tubing.
g. Calculation of the flow rate.
h. Regulation of the flow rate manually or via an infusion pump.
i. Documentation.

2. Maintain peripheral infusion of fluids and/or medications by:

a. Checking the flow rate.
b. Regulating the flow rate.
c. Changing site dressing.
d. Changing tubing.
e. Hanging replacement solutions.
f. Converting continuous infusion to an intermittent infusion.
g. Flushing of the device and tubing
h. Documentation
i. Discontinuing the infusion

3. Assist the registered nurse in the peripheral Administration of blood and blood products and plasma expanders by:

a. Checking blood or blood products with the RN for identification purposes.
b. Obtaining prior history of blood reactions.
c. Hanging the blood, blood components or plasma volume expander
d. Observing the patient during transfusion.
e. Monitoring infusion rate of blood and blood products.
f. Monitoring the function of electronic blood infusion pumps.
g. Discontinuing blood/blood product infusion.
h. Documentation

B. MIDLINE AND/OR MIDCLAVICULAR PERIPHERAL CATHETERS:

Upon direction of the registered nurse, physician or dentist, the licensed practical nurse, qualified by the necessary education, experience and current clinical competence, may perform the following select intravenous therapy procedures related to midline and/or midclavicular peripheral intravenous catheters including:

1. Initiate and discontinue the administration of IV fluids and/or medications given via a midline/midclavicular peripheral intravenous catheter including:

a. Noting the physician's order.
b. Preparing the administration equipment.
c. Calculation of the flow rate.
d. Regulation of the flow rate manually or via an infusion pump.
e. Administration of a routine/maintenance medication via a preprogrammed pump. (This does not include medications administered in emergent situations).
f. Documentation.

2. Maintaining peripheral infusion of IV fluids via a midline/midclavicular intravenous catheter by:

a. Checking the flow rate.
b. Regulating the flow rate.
c. Changing the site dressing.
d. Changing tubing.

e. Hanging replacement fluids.
f. Converting continuous infusion to intermittent infusion.
g. Documentation.

C. CENTRAL VENOUS CATHETERS

When delegated by the registered nurse, the licensed practical nurse may administer intravenous fluids, medications and parenteral nutrition via select types of central venous catheters. The registered nurse should exercise prudent judgment when determining whether these acts should be delegated to the licensed practical nurse. The licensed practical nurse should possess documented evidence of the necessary education, experience and current clinical competency in the performance of these acts (see attached recommended curriculum content for IV Therapy continuing education programs). The types of central venous catheters which may be accessed by the licensed practical nurse are as follows:

1) Peripherally Inserted Central Catheters (PICC);
2) Implanted or Tunneled Central Venous Catheters; and
3) Central Venous Access Ports/ Implanted Ports—Based upon the September 1, 2006 revision of 201 KAR 20:490, the LPN may not insert a needle into an implanted port, but may remove it.

Upon direction of the registered nurse, physician or dentist, the licensed practical nurse, qualified by the necessary education, experience and current clinical competence, may perform the following select intravenous therapy procedures related to central venous catheters (as defined above):

1. Initiate IV fluids and medications via a central venous catheter.

   a. Noting the physician's order.
   b. Preparing the administration equipment.
   c. Securing the device and tubing.
   d. Calculation of the flow rate.
   e. Regulation of the flow rate manually or via a pump.
   f. Administration of routine/maintenance medications via preprogrammed infusion pump. (This does not include medications administered in emergent situations).
   g. Documentation.

2. Maintain infusion of fluids via a central venous catheter by:

   a. Checking the flow rate.
   b. Regulating the flow rate.
   c. Changing site dressing.
   d. Changing tubing.
   e. Hanging replacement solutions.
   f. Convert continuous infusion to intermittent infusion.
   g. Discontinuation of IV fluids or medications.
   h. Documentation.

RN ROLE

It is the opinion of the Board that the procedures listed below are within the scope of registered nursing practice and not within the scope of licensed practical nursing practice. The registered nurse performs procedures previously described within the LPN role, and performs additional intravenous procedures, which include, but are not limited to, the following:

1. Administration of tissue plasminogen activators, antineoplastic agents, and investigational drugs.
2. Administration of medications and/or fluids via percutaneously or surgically inserted non-tunneled, non-implanted central venous catheters (i.e., subclavian or jugular lines).
3. Access central venous catheters used for hemodynamic monitoring.
4. Administration of medications/fluids via arterial lines.
5. Draw blood samples via a central venous access port.
6. Administer fibrinolytic/thrombolytic agent to declot a venous device.
7. Administer medication via direct peripheral or central intravenous route (i.e., push, bolus).
8. Administer medications requiring titration, or continuous patient assessment.
9. Aspirate an arterial line or central venous needle or catheter. NOTE: In April, 2003, the Board clarified that it is within the scope of licensed practical nursing practice to aspirate a central venous catheter to confirm patency, via positive blood return; however, the withdrawal of blood specimens via a central venous catheter is not within the scope of licensed practical nursing practice.
10. Remove an intravenous cannula from the following: femoral, subclavian, jugular vein, or any arterial site or cut-down site.
11. Accessing and programming implanted infusion pumps.
12. Initiate and remove peripherally inserted central, midclavicular and midline catheters (see AOS #25).

GLOSSARY OF TERMS

Arterial Pressure Monitoring: Monitoring of arterial pressure through an indwelling catheter connected to an electronic monitor.

Antineoplastic agent: A medication for the treatment of cancer.

Bolus: Concentrated medication/solution given rapidly over a short period of time; may be given by direct infusion injection (push) or gravity drip.

Central Catheters: Catheters that are inserted in such a manner that the distal tip is located in the superior vena cava.

Central Venous Access Port/Implanted Port: A catheter surgically placed into a vessel, body cavity or organ and attached to a reservoir. The reservoir is placed under the skin.

Cutdown: Surgical procedure for exposure and cannulation of a vein.

Hemodynamic Pressure Monitoring: The measurement of pulmonary artery pressure, arterial pressure, cardiac output, etc., via an electronic monitor.

Implanted Pump: A catheter surgically placed into a vessel, body cavity or organ and attached to a reservoir that contains a pumping mechanism for continuous medication administration. The reservoir is placed under the skin.

Intermittent Intravenous Therapy: Intravenous therapy that is administered at prescribed intervals with periods of infusion cessation.

Midline catheters: Catheters inserted in the peripheral venous system with the tip located in the proximal portion of the extremity.

Midclavicular Catheters: Catheters inserted in the peripheral venous system with the tip located at the axiliary-subclavian vein junction.

Parenteral: Denoting any route other than the alimentary canal, such as intravenous.

Parenteral Nutrition: Nutrients that are administered intravenously and are comprised of carbohydrates, proteins, and/or fats, as well as additives such as electrolytes, vitamins and trace elements.

Thrombolytic Agent: A pharmacological agent capable of dissolving blood clots.

Tunneled Catheter: A catheter designed to have a portion lie within a subcutaneous passage before exiting the body.

DETERMINING SCOPE OF PRACTICE

KRS 314.021(2) holds all nurses individually responsible and accountable for the individual's acts based upon the nurse's education and experience. Each nurse must exercise professional and prudent judgment in determining whether the performance of a given act is within the scope of practice for which the nurse is both licensed and clinically competent to perform. In addition to this advisory opinion statement, the Kentucky Board of Nursing has published "Scope of Practice Determination Guidelines" which contains a decision tree chart providing guidance to nurses in determining whether a selected act is within an individual nurse's scope of practice now or in the future. A copy of the guidelines may be obtained (cost $1.00) from the Board office.

This opinion statement is an advisory opinion of the Board as to what constitutes safe nursing practice; it is not a regulation of the Board and therefore does not have the force and effect of law. It is issued as a guidepost to licensees who wish to engage in safe nursing practice.

Revised: 10/84; 10/87; 8/89; 12/89; 3/91; 4/92; 12/92; 12/93; 6/99; 4/01; 6/01; 4/03; 9/06; 4/08
Editorial revision: 5/04; 9/04; 6/05; 9/08

Attachment (1)

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RECOMMENDED COURSE CONTENT

**INTRAVENOUS (IV) THERAPY
FOR
REGISTERED NURSES AND LICENSED PRACTICAL NURSES
FOR COURSES DEVELOPED FOR AOS # 3**

PURPOSE

The Kentucky Board of Nursing (KBN) has developed recommended course content to be included in a basic intravenous (IV) therapy prelicensure or continuing education course for licensed practical nurses who wish to perform specified IV therapy procedures as defined in the KBN Advisory Opinion Statement 99-03 IVT, "Roles of Nurses in Intravenous Therapy Practice."

COURSE DESCRIPTION

An intravenous therapy course should be designed to provide fundamental knowledge, skills and abilities needed by Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) to perform specified IV therapy procedures. Course content should include but not be limited to 1) legal scope of nursing practice for RNs and LPNs in IV Therapy; 2) needs of clients receiving IV therapy; 3) related anatomy and physiology including fluid and electrolytes balance; 4) principles and procedures for venipuncture and site maintenance; 5) principles of pharmacology as related to IV therapy; 6) principles and procedures for administration of specified solutions and medications via intravenous route; 7) principles of blood and blood products administration; 8) assessment of and appropriate interventions for complications related to IV therapy; and 9) demonstration and practice of specified IV therapy procedures.

COURSE OBJECTIVES

Upon completion of all instructional components of an IV Therapy course, the RN or LPN participant should demonstrate the ability to:

1. Discuss the legal implications of RN or LPN practice as related to the performance of IV therapy procedures.

   A. Identify a minimum of two (2) legal considerations in each of the following regarding IV therapy and the scope of practice for the RN and LPN:

      1. Kentucky Nursing Laws
      2. Related Kentucky administrative regulations
      3. Related KBN advisory opinion statements
      4. National nursing standards of practice
      5. Health care facility policies, and
      6. Health care facility job descriptions

B. Discuss the accountability and responsibility of the RN and LPN in the performance of specified IV therapy procedures.

C. State the limitations of practice for the LPN who has successfully completed a Kentucky Board of Nursing approved IV therapy course.

D. Identify the principles of quality control/assurance and risk management related to IV therapy practice.

2. Identify normal anatomy and physiology applicable to IV therapy practice.

   A. Describe the structure and function of the vascular system.

   B. Describe the interrelatedness of the vascular system and other body systems in maintaining fluid equilibrium.

   C. Discuss the distribution and physiologic balance of fluids and electrolytes in the body.

   D. Identify the basic physiological principles applicable to the safe performance of IV therapy procedures.

   E. Identify two (2) veins on the dorsal aspect of the hand and two (2) veins in the arm commonly used to administer IV fluids.

   F. Differentiate between arteries and veins in each of the following: tissue layers, color of blood, pulsation, valves, location, tissues supplied, spasm of vessels, and blood flow.

3. Assist in the implementation of the nursing process in caring for clients receiving IV therapy.

   A. Discuss the role of the LPN in the management of care for a patient receiving IV therapy.

   B. Discuss the nursing responsibilities in assisting the patient to maintain fluid and electrolyte balance.

   C. Discuss nursing measures for patient's receiving IV therapy, which contribute to the nursing care plan.

   D. Identify how each of the following affects vital sign measurement, i.e., heart rate/rhythm, respiratory rate, and blood pressure:

      1. Fluid retention/deficit
      2. Increased/decreased blood volume
      3. Vasodilatation/vasoconstriction
      4. Increased/decreased cardiac output

   E. Describe the observable effects of isotonic, hypertonic, and hypotonic IV fluids on the body.

   F. Observe and report adverse reactions related to IV therapy and initiate appropriate nursing intervention.

4. Initiate, maintain, monitor, and/or discontinue IV therapy as defined in the Kentucky Board Nursing advisory opinion statement.

   A. Accurately interpret medical orders for IV therapy.

   B. Select appropriate sites and infusion devices for IV infusion administration.

   C. Demonstrate assembling and setting up IV solutions with tubing and needles.

   D. Correctly and aseptically start a peripheral IV infusion.

   E. Given a prescribed quantity of fluid to be infused, calculate a flow rate correctly.

F. Demonstrate appropriate use of selected IV equipment including: infusion pumps, mechanical controllers, and patient controlled administration systems.

G. Demonstrate both continuous and intermittent administration of IV fluids and/or medications.

H. Demonstrate accurate documentation of IV therapy.

I. Demonstrate IV therapy maintenance procedures, i.e., site care, dressing and tubing changes, conversion of primary line to intermittent access device, hanging replacement solutions and pre-mixed medications.

J. Discontinue IV infusion safely.

K. Identify local and systemic complications common to IV therapy and discuss appropriate nursing interventions.

L. Differentiate the role of the registered nurse and the role of the licensed practical nurse in the maintenance of central line infusion as defined in the Kentucky Board of Nursing advisory opinion statement.

5. Identify the drugs and solutions commonly used in IV therapy and discuss their action, therapeutic dosage, and adverse effects.

   A. Identify the principles of medication administration as related to premixed medication additives for IV therapy.

   B. Identify the incompatibilities of selected drugs and fluids including blood and blood products.

   C. Address the classifications of intravenous medications, including but not limited to, indications for use, pharmacological properties, contraindications, dosing, clinical mathematics, anticipated side effects, potential complications/antidotal therapy, compatibilities, stabilities, and any other specific special considerations.

   D. Discuss the dosage, action, and adverse effects of the commonly used emergency IV medications.

   E. Identify the principles related to the safe administration of blood and blood products.

   F. Differentiate the role of the registered nurse and the licensed practical nurse in the peripheral administration of blood and blood products as defined in the Kentucky Board of Nursing advisory opinion statement.

   G. Describe potential reaction to blood/blood products and related nursing interventions.

6. Maintain aseptic techniques and established infection control practices.

   A. Discuss universal infection control principles and practices as related to IV therapy.

   B. Identify principles of quality control/assurance.

   C. Demonstrate appropriate practice of medical asepsis when performing IV therapy procedures.

Approved: 8/89
Revised: 10/89; 12/89; 12/92; 10/93, 6/99; 6/05