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**OPINION:** LPN BASIC & ADVANCED IV THERAPY TRAINING AND COMPETENCY EVALUATION COURSE

**APPROVED DATE:** November 5, 2013

**REVIEWED DATE:** 

**REVISED DATE:** 

**ORIGINATING COMMITTEE:** Practice & Education Committee

An advisory opinion adopted by WSBN is an interpretation of what the law requires. While an advisory opinion is not law, it is more than a recommendation. In other words, an advisory opinion is an official opinion of WSBN regarding the practice of nursing as it relates to the functions of nursing. Facility policies may restrict practice further in their setting and/or require additional expectations related to competency, validation, training and supervision to assure the safety of their patient population and/or decrease risk.

Within the Scope of Practice/Role of ____APRN ____RN __ X_LPN ___CNA

**ADVISORY OPINION**

**LPN BASIC & ADVANCED IV THERAPY TRAINING AND COMPETENCY EVALUATION COURSE**

**Introduction:**

IV therapy courses may be offered after basic practical nursing education has been completed. IV therapy courses shall be administered by a licensed health care facility or nursing education program in an institution of higher learning.

IV therapy for LPNs includes a basic and advanced curriculum. Once approved for certification in Wyoming, the LPN must practice within the scope of an LPN with Basic and/or Advanced IV Therapy training as outlined *LPN Basic & Advanced IV Therapy Scope of Practice Advisory Opinion*. IV therapy courses taken in other states are accepted providing that the course meets or exceeds the curriculum set forth by WSBN in this Advisory Opinion.

Certification renewal will require the following:

- Renewal application and fee;
- Submit documentation of completion of a minimum of ten (10) contact hours of continuing education and/or in-service education in intravenous therapy within the previous two (2) year period; or
- Submit documentation of successful completion of a Board-approved LPN IV Therapy Refresher Course.
Intent of Advisory Opinion:
In accordance with W.S. 33-21-122 (c) (iii) of the Wyoming Nursing Practice Act (NPA), the WSBN has approved the following Advisory Opinion on LPN IV Therapy Training and Competency Evaluation. The purposes of this opinion are to establish acceptable standards for basic and advanced knowledge and skills necessary in the administration and management of IV therapy by LPNs and to define specific guidelines of course content and evaluation.

ACCEPTABLE CURRICULUM FOR BASIC IV THERAPY

COURSE DESCRIPTION:
This Basic IV Therapy Course for LPNs is directed toward establishing acceptable standards to delineate the beginning skills and knowledge needed to administer and manage IV therapy. Basic Guidelines include: legal aspects of IV system, fluid & electrolyte balance, procedure for venipuncture, prevention & assessment of complications, principles of pharmacology as related to IV therapy, and demonstration & practice of required skills.

GENERAL COURSE OBJECTIVES:
At the completion of all course instruction, the student will:
- Comprehend the policies, procedures, rules and regulations that govern the LPN in Wyoming when administering and managing IV therapy;
- Define the legal implications when administering and managing IV therapy;
- Express verbally and/or in writing a basic knowledge of the anatomy and physiology of the adult circulatory system;
- Understand the role of fluid and electrolytes in maintenance of homeostasis;
- Understand the principles of pharmacology as they relate to IV therapy;
- Demonstrate a knowledge of the drugs and solutions commonly used in IV therapy and discuss their action, correct dosage, and adverse effects;
- Model safe use of selected IV equipment;
- Calculate flow rate correctly and regulate selected infusions;
- Demonstrate the ability to safely perform venipunctures with selected equipment;
- Employ safe, effective care of patients receiving IV therapy and discuss the signs and symptoms;
- Understand the complications that may occur from IV therapy and discuss the signs and symptoms; and
- Outline the nursing action to be taken if complications occur.

GENERAL COURSE REQUIREMENTS:
- The Basic IV Therapy Course for LPNs is offered and administered by a licensed health care agency or nursing program in an institution of higher education.
- The length of the course shall be a minimum of 16 hours classroom and 16 hours clinical experience. The didactic portion of the course must be completed within six weeks or within the confines of an academic course.
- Class attendance is mandatory. Any classes missed must be made up at the convenience of the instructor.
- The participant taking this Basic IV Therapy Course for LPNs demonstrates competency by written and practical examinations receiving a minimum score of 80% on each examination.
- Competently perform 3 supervised successful venipunctures.
- Graduates of this course will receive a "Certificate of Completion."
- Only LPNs completing a course in IV therapy may administer and manage IV therapy in the State of Wyoming.
The Basic IV Therapy Course for LPNs shall be revised and updated by WSBN as necessary.

FACULTY QUALIFICATIONS:
- Hold a current license to practice as a registered professional nurse (RN) in Wyoming. (Registered in at least one state if employed in a federal institution.),
- A currently licensed RN who has had recent experience in performing IV therapy may be utilized to provide clinical supervision and assist in classroom teaching.

STUDENT QUALIFICATIONS:
Participants must possess a current unencumbered LPN license in the State of Wyoming.

COURSE CONTENT:
The following subject areas being tested will include:

<table>
<thead>
<tr>
<th>UNITS OF INSTRUCTION</th>
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<tbody>
<tr>
<td>Unit I: The Basic IV Therapy for LPNs Course Including Legal Aspects</td>
</tr>
<tr>
<td>Unit II: Review of Anatomy and Physiology of the Adult and Geriatric Circulatory System</td>
</tr>
<tr>
<td>Unit III: Fluid and Electrolyte Balance</td>
</tr>
<tr>
<td>Unit IV: Starting, Maintaining, and Discontinuing IV Therapy</td>
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<tr>
<td>Unit V: Pharmacology</td>
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<tr>
<td>Unit VI: Clinical Application</td>
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</tbody>
</table>

COURSE EVALUATION CRITERIA:
1. Teaching methods include classroom lectures, demonstration, simulation, return demonstration, supervised clinical practice, and classroom and clinical performance evaluations.
2. Evaluation Criteria:
   - Quizzes will be given during the course.
   - The final comprehensive examination will be given at the end of the course.
   - A final practicum examination will be given.
   - It is necessary for successful completion of the course to obtain 100% competency on dosage calculation.
   - A minimum of three (3) supervised successful venipunctures will be completed.

NOTE: Students are responsible for notifying the instructor prior to examination if unable to take scheduled test.

UNIT I: Basic IV Therapy for LPNs Including Legal Aspects

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Identify the requirements each student must meet in order to successfully complete the course. | Course Requirements
- Length of course
- Satisfactory completion
- Attendance
- Evaluation
- Certificate of completion
- Administering and managing IV therapy in Wyoming |

| Identify two (2) considerations in each of the following regarding IV therapy and the scope of practice for the LPN: Wyoming NPA; health care facility policies; job description. | Purposes of IV Therapy Course
- Need in Wyoming
- Qualified nursing personnel |
State the general legal considerations governing the practice of practical nurses in the State of Wyoming. State eight (8) limitations of practice for the LPN who has taken this course.

**General Legal Considerations Governing Practical Nursing**
- Wyoming NPA
- Rules and Regulations - Standards of Nursing Practice for the Registered Professional Nurse and the LPN
- LPN Basic & Advanced IV Therapy Scope of Practice Advisory Opinion

Define and give an example of four (4) of the following: tort, malpractice, negligence, personal liability, assault and battery, slander and libel, invasion of privacy.

**Guidelines for the LPN IV Therapy Scope of Practice**

<table>
<thead>
<tr>
<th>A. The LPN may perform the following procedures under the direction of a registered nurse (RN), physician, or dentist, due to the basic knowledge and skills acquired in a state board approved practical nursing program:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. observe and monitor IV fluid management;</td>
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<tr>
<td>2. calculate and maintain flow rate of peripheral IV infusions;</td>
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<tr>
<td>3. discontinue peripheral IV infusions; and</td>
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<tr>
<td>4. report and document observations and procedures relating to IV fluid treatment</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>B. The LPN who has satisfactorily completed a basic course of IV therapy for LPNs may perform the following functions and duties in addition to those identified above, relating to the administration and management of IV therapy under the direction of a registered professional nurse, physician or dentist:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initiate the administration of board-approved IV fluids and medications via the peripheral route. The peripheral route does not include midline catheters.</td>
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<tr>
<td>2. Administer IV fluids and medications including electrolyte solutions with vitamins and/or potassium, antibiotics and hydrogen receptor blockers provided such fluids and medications are appropriate for IV administration;</td>
</tr>
<tr>
<td>3. Change IV tubing(s) and dressings;</td>
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<tr>
<td>4. IV fluids and medications must be commercially prepared or premixed and labeled by a registered pharmacist.</td>
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<tr>
<td>5. Maintain patency of a peripheral intermittent vascular access device using a saline flush solution or non-therapeutic dose of heparin flush solution;</td>
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</tbody>
</table>
6. Monitor a patient controlled administration (PCA) pump and collect data from a PCA pump;
7. Perform phlebotomy; and
8. Activate a drug admixture delivery system that has been prepared and labeled by a pharmacist, registered nurse or other qualified person.

C. The LPN certified in basic IV therapy shall not:
1. Initiate, regulate, add, or administer medications to or discontinue a midline or central venous line;
2. Administer or add the following to a peripheral venous line:
   i. IV push or bolus medications; or
   ii. IV medications other than those identified above;
3. Inject medication into an auxiliary fluid chamber;
4. Mix or label IV medications or total parenteral nutrition (TPN);
5. Program or change the re-program a PCA pump;
6. Administer blood, blood components, plasma, plasma expanders;
7. Administer analgesics, antineoplastics, autonomic nervous system agents, cardiovascular agents, central nervous system agents, oxytocic agents, or radiologic agents;
8. Initiate and/or maintain pediatric IV therapy (aged twelve (12) years and under); nor discontinue pediatric IV therapy (aged birth to four (4) years);
9. Flush or aspirate an central venous line or arterial line; or
10. Perform basic acts of IV therapy as listed in this section in the home setting.

Identify four (4) essential considerations in obtaining liability-malpractice insurance.

Related Legal Terms as Applicable to IV Therapy
Criminal, Civil law, Tort Law
Malpractice
Negligence
- Assault and battery
- Slander and Libel
- Invasion of privacy
- Personal liability

Legal Responsibility to the Nurse, to the Patient, to the Physician, to the Community, to the Institution
Liability-Malpractice Insurance
- Considerations
- Institutional vs. personal insurance
### Unit II: Review of Anatomy and Physiology of the Adult and Geriatric Circulatory System

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td>Describe the anatomy and physiology of the adult circulatory system.</td>
<td>I. Terminology</td>
</tr>
</tbody>
</table>
| Describe the physiological changes created by the aging process. | II. Overview of the Circulatory System  
- Essential Considerations in Administering and Managing IV Therapy including Changes Associated with Aging  
- Components of System  
- Blood  
  a. Function  
  b. Composition |
| Describe the relationship between the circulatory system and other body systems in maintaining fluid equilibrium. | III. Blood Cells  
- RBC  
- WBC  
- Platelets |
| Identify three (3) reasons why it is essential to be knowledgeable about the anatomy and physiology of the circulatory system in order to completely carry out basic IV therapy techniques. | IV. Blood Vessel System  
- Heart  
- Comparison between arteries and veins  
- Circulation of blood  
  a. Blood flow, trace  
  b. Pulses, identify, differentiate  
  c. Blood pressure, rate, rhythm, volume  
  d. Other essential considerations |
| Trace the blood flow through the heart and lungs. | V. Cardiac Cycle  
- Heart  
- Conduction System |
| Identify two (2) veins on the dorsal aspect of the hand and two (2) veins in the arm used in giving IV fluids. | VI. Role of the Circulatory System in Maintaining Fluid Equilibrium |
| Define terms relating to the circulatory system. | |
| Differentiate between arteries and veins in six (6) of the following: tissue layers, color of the blood, pulsation, valves, location, tissues supplied, spasm of vessels, blood flow. | |

### UNIT III: Fluid and Electrolyte Balance

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
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</thead>
</table>
| Define related terminology. | I. Body Fluids  
- Major Fluid Compartments  
- Body Electrolytes |
| Discuss the distribution of fluids and electrolytes in the body. | II. Basic Physiological Process of Fluid and Electrolyte Balance  
- Filtration  
- Diffusion  
- Osmosis |
Explain the basic mechanisms utilized by the body to maintain homeostasis.

### III. Regulatory Mechanisms
- Renal
- Endocrine
- Cardiovascular
- Respiratory

Discuss the physiological process of fluid and electrolyte balance.

### IV. Assessing Fluid and Electrolyte Balance, pH, Acid-Base Imbalance

Describe the effects of isotonic, hypertonic and hypotonic IV fluids in the body.

### V. Treatment of Electrolyte Imbalance
- Sodium Imbalance
- Potassium Imbalance
- Nursing Responsibilities

Give the normal range of pH.

Discuss the effects of acid-base imbalance.

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

Discuss the nursing responsibilities in monitoring and nursing assessments e.g.: intake and output, weight, fluid overload, lab values, peaks and valleys.

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**Unit IV: Starting, Maintaining, and Discontinuing IV Therapy**

<table>
<thead>
<tr>
<th><strong>OBJECTIVES</strong></th>
<th><strong>CONTENT</strong></th>
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</thead>
</table>
| Demonstrate an understanding of body substance isolation. | I. Patient Assessment
- Background information
  a. Diagnosis - current and related
  b. Medical plan of treatment
  c. Allergies
  d. Conditions contraindicating use of IV’s
- Physical and mental status
  a. Level of consciousness
  b. Ability to comprehend instructions
  c. Conditions of veins and skin
  d. Pathophysiological conditions that dictate site selection |
| Demonstrate the ability to do a physical and mental assessment on all assigned patients. | II. Decisions related to Equipment, Supplies in relationship to Client Characteristics
- Equipment Types
  a. Infusion systems (bag, closed, open)
  b. Catheters tubing (vented, non-vented, filtered)
  c. Dressings
  d. Adapters, intermittent infusion sets
- Considerations for Selection
  a. Planned use
  b. Skin preparation
  a. Condition of vessel
  b. Duration of therapy |
<p>| List indications for IV therapy. | III. Demonstration and Case Studies |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Topics</th>
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<tbody>
<tr>
<td>How to set up various types of equipment</td>
<td>How to set up various types of equipment</td>
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<tr>
<td>When to use specific types of equipment</td>
<td>When to use specific types of equipment</td>
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<tr>
<td>Clinical case studies</td>
<td>Clinical case studies</td>
</tr>
<tr>
<td>Select appropriate sites for and demonstrate insertion of IV infusion</td>
<td>IV. Calculation of Flow Rates</td>
</tr>
<tr>
<td>devices.</td>
<td>• Flow rates of various products</td>
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<td>• Practice demonstrations using calculation formula</td>
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<td>• Factors affecting flow rates</td>
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<tr>
<td>Given a prescribed quantity of fluid to be infused, calculate a flow</td>
<td>V. Infusion Pumps and Controllers</td>
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<td>rate correctly.</td>
<td>• Uses</td>
</tr>
<tr>
<td></td>
<td>• Demonstration of setting up</td>
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<tr>
<td>Correctly and aseptically start an IV infusion.</td>
<td>VI. Intermittent Infusion Therapy</td>
</tr>
<tr>
<td></td>
<td>• Uses</td>
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<td></td>
<td>• Procedure for use - various types</td>
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<tr>
<td>Demonstrate use of infusion pumps and controllers accurately.</td>
<td>VII. Venipuncture Technique</td>
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<td></td>
<td>• Preparing patient physically and emotionally</td>
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<td>• Aseptic technique - sources of contamination</td>
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<td>• Assessment of patient and equipment</td>
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<td>• Venipuncture technique</td>
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<td>• Dressings and maintenance of safety</td>
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<td>• Instructions to patient</td>
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<td>• Documentation</td>
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<tr>
<td>Demonstrate assembling and setting up IV solutions with tubing and</td>
<td>VIII. Discontinuing IV Catheters:</td>
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<td>needles.</td>
<td>• Demonstrate procedure</td>
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<td>• Cultures - when and how</td>
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<td>• Documentation</td>
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<tr>
<td>Discontinue an IV infusion safely.</td>
<td>IX. Local complications: Pathophysiology, Signs and Symptoms</td>
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<tr>
<td></td>
<td>• Infiltration</td>
</tr>
<tr>
<td></td>
<td>• Hematoma</td>
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<td>• Thrombus</td>
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<td>• Phlebitis</td>
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<td>• Thrombophlebitis</td>
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<td>• Cellulitis</td>
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<td>• Nerve damage</td>
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<tr>
<td>Demonstrate correct documentation of IV therapy.</td>
<td>X. Systemic Complications: Pathophysiology, Signs and Symptoms</td>
</tr>
<tr>
<td></td>
<td>• Pyrogenic reaction</td>
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<tr>
<td></td>
<td>• Catheter embolism</td>
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<td>• Air embolism</td>
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<td>• Speed shock</td>
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<td></td>
<td>• Septicemia</td>
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<td>• Pulmonary edema</td>
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<tr>
<td>Define related terminology.</td>
<td>XI. Role of the Nurse</td>
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<td></td>
<td>• Assessment techniques</td>
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<td></td>
<td>• Interventions</td>
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<td></td>
<td>• Evaluation techniques</td>
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<td>• Documentation</td>
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<tr>
<td>Identify local complications common to IV therapy.</td>
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<tr>
<td>Discuss the systemic complication that might occur as a result of IV therapy.</td>
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<tr>
<td>Discuss the role of the nurse in the management of a patient with complications resulting from IV therapy.</td>
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<tr>
<td>Discuss pathophysiological conditions that would dictate IV site selection.</td>
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## Unit V: Pharmacology

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td>Define related terminology.</td>
<td>I. Proper related terminology</td>
</tr>
<tr>
<td>List the hazards of fluid overload and air embolism.</td>
<td>II. Fluids and their particular uses</td>
</tr>
<tr>
<td>Describe the indications of infiltration and the appropriate action to be taken.</td>
<td>III. Medications</td>
</tr>
<tr>
<td>Demonstrate verbally and in writing knowledge of the incompatibilities of selected drugs and fluids.</td>
<td>Routine IV medications:</td>
</tr>
<tr>
<td>Discuss the normal dosage, action and adverse effects of the following IV medications: a. analgesics b. antimicrobials c. anticoagulants d. bronchodilators e. cardiovascular drugs f. electrolytes g. tranquilizers h. vitamins</td>
<td>Normal dosage ranges Desired drug action Proper administration Adverse effects Other factors that influence drug actions and infiltration problems Emergency IV medications</td>
</tr>
<tr>
<td>Discuss the dosage, action and adverse effects of the commonly used emergency IV medications.</td>
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</table>

- Adverse reactions from fluids such as fluid overload, air embolism and infiltration
### Unit VI: Clinical Application (16 hours)

**CRITICAL CRITERIA FOR CLINICAL PRACTICUM**  
**Basic IV Therapy for LPNs**

<table>
<thead>
<tr>
<th>Student’s Name:</th>
<th>Faculty Name:</th>
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<table>
<thead>
<tr>
<th><strong>A. Aseptic Technique</strong></th>
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<tbody>
<tr>
<td>• Maintain aseptic technique at all times throughout preparation, insertion procedure, device securement, &amp; accessing the line</td>
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<tr>
<td>• Perform hand hygiene before procedure</td>
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<tr>
<td>• Wear gloves during insertion &amp; securement, as well as at any time exposure to blood borne pathogens is possible</td>
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<tr>
<th><strong>B. Gather Equipment</strong></th>
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<tr>
<td>• Gloves</td>
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<tr>
<td>• Sterile disposable I.V. infusion set</td>
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<tr>
<td>• Safety IV catheter of appropriate gauge size for required therapy</td>
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<tr>
<td>• Arm board (PRN per facility protocol depending on age &amp; mental status of patient)</td>
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<tr>
<td>• Disposable tourniquet</td>
<td></td>
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<tr>
<td>• Agency approved skin preparation solution</td>
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<tr>
<td>• Agency approved catheter stabilization dressing</td>
<td></td>
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<tr>
<td>• Tape (IV start kit may be substituted for individual components)</td>
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<tr>
<td>• Prescribed solution</td>
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<tr>
<td>• All equipment for IV insertion &amp; medication administration is SINGLE PATIENT USE ONLY</td>
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<thead>
<tr>
<th><strong>C. Preparation of solution</strong></th>
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<tbody>
<tr>
<td>• Verify doctor’s orders</td>
<td></td>
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<tr>
<td>• Check solution for particulate matter and discoloration</td>
<td></td>
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<tr>
<td>• Check containers for leaks and cracks</td>
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<tr>
<td>• Check expiration date on solution</td>
<td></td>
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<tr>
<td>• Check for vacuum at time seal is broken</td>
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<tr>
<td>• Use equipment appropriate to solution container</td>
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<thead>
<tr>
<th><strong>D. Assemble I.V. Equipment</strong></th>
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<tbody>
<tr>
<td>• Unwrap and inspect IV tubing</td>
<td></td>
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<tr>
<td>• Clamp tubing, uncap spike &amp; insert into solution container</td>
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</tr>
<tr>
<td>• Squeeze drip chamber</td>
<td></td>
</tr>
<tr>
<td>• Release drip chamber and invert IV tubing</td>
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<tr>
<td>• Open clamp and fill tubing</td>
<td></td>
</tr>
<tr>
<td>• Check for and remove any air bubbles</td>
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<tr>
<td>• Load infusion pump, if used, appropriately</td>
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<thead>
<tr>
<th><strong>E. Venipuncture</strong></th>
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<tbody>
<tr>
<td>• Wash hands before procedure, don gloves</td>
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</tr>
<tr>
<td>• Verify client using 2 patient identifiers</td>
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<tr>
<td>• Verify any allergies</td>
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<tr>
<td>• Prepare client for procedure, obtain verbal consent to proceed</td>
<td></td>
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<tr>
<td>• Assure all necessary equipment is available at bedside</td>
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<tr>
<td>• Place tourniquet 6-12” above intended insertion site</td>
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<tr>
<td>• Select most appropriate distal venous site</td>
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<tr>
<td>• Use appropriate technique to dilate or distend vein</td>
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</tbody>
</table>
- Prepare area with facility approved antiseptic agent, maintain aseptic technique at all times
- Provide a minimum 15 second aseptic scrub to insertion site
- Insert device using correct method, advance catheter to hub, occlude vessel above catheter (to control blood flow) & activate safety mechanism to remove needle from working area
- Dress insertion site appropriately
- Remove the tourniquet, apply extension set PRN per facility protocol
- Attach catheter to end of tubing or extension set using aseptic technique
- Stabilize extremity as needed using arm board or other supportive devices
- Calculate infusion rate correctly
- Adjust flow rate to specified infusion rate or enter correct pump settings for infusion
- Use appropriate comfort measures

F. Skills checklist. Important Steps in Care of Client
- Flush with appropriate flush solution before AND after medication infusion to prevent catheter occlusion. Clamp line after infusion if indicated in facility protocol.
- Drip chamber should be ½ to 2/3 full
- Observe that IV is dripping (patency of line)
- Observe & maintain correct rate of flow
- Check for kinks in tubing
- Maintain optimal infusion position for client's extremity
- Check for leakage around area of catheter insertion
- Check for signs of infiltration around catheter site at facility-specified intervals (redness, swelling, pain, hematoma formation)
- Document condition of site correctly at established intervals
- Don gloves. Remove any device if extremity demonstrates redness, edema, pain or bruising. Dress per facility protocol
- Remove any device more than 72-96 hours old, or at interval ordered by physician.
- Correctly calculate & document Intake and Output
- Discontinue catheter and infusion equipment in appropriate & safe manner per facility protocol
- Check tip integrity of catheter upon removal from client, respond appropriately if catheter is compromised
- Document as required in facility protocol, with a minimum entry of gauge device placed, date/time, how client tolerated procedure & instructions given (on insertion and discontinuation of line)

G. Infusion pumps
- Demonstrate knowledge as to when pumps should be used
- Set up pump using aseptic technique according to manufacturers’ instructions and physician’s order for therapy
- Label IV tubing per facility protocol
- Check all alarms and turn them off
- Instruct client re: pump, alarms & when to call nursing staff
- Check pump settings, infusion & insertion site at intervals established in facility protocol

**ACCEPTABLE CURRICULUM FOR ADVANCED IV THERAPY**

**COURSE DESCRIPTION:**
This Advanced IV Therapy Course for LPNs is directed toward establishing standards to assist the LPN in IV medication administration and central line management. Advanced Guidelines include: all basics
IV therapy content as well as mix, label and administer IV medications that are not restricted by institutional policies, assist the RN in the administration of central venous infusion by administering TPN and obtaining a blood specimen and discontinue pediatric (aged five (5) to twelve (12) years) peripheral IV therapy.

**GENERAL COURSE OBJECTIVES:**
At the completion of all course instruction, the student will:
- Comprehend the functions and duties defined in the advisory opinion on the Advanced IV Therapy course for LPN's.
- Define legal implications regarding IV medication administration and management of central lines;
- Review anatomy and physiology of the adult circulatory system;
- Identify the action of body fluids and electrolytes in maintaining homeostasis;
- Analyze the principles of pharmacology as they relate to IV medication administration and central line management.
- Apply the knowledge of the drugs and solutions commonly used in IV therapy and discuss their actions, dosages, and adverse effects;
- Outline the various types of central line catheters and ports and placement in the venous system;
- Review calculation of flow rates;
- Demonstrate access, care and management of central lines including sterile technique;
- Understand the complications that may occur from IV medication administration and use of central lines;
- Discuss nursing actions to be taken while caring for the patient with a central line; and
- Discuss nursing actions to be taken while caring for the patient with a central line when complications occur.

**GENERAL COURSE REQUIREMENTS:**
- The participant must have successfully completed the Basic IV Therapy Course for LPNs.
- The Advanced IV Therapy Course for LPNs is offered and administered by a licensed health care agency or nursing program in an institution of higher education.
- The total length of the course shall be at least 35 hours. There shall be a minimum of 13 hours classroom, 6 hours clinical lab, and 16 hours independent study. The didactic portion of the course must be completed within six weeks or within the confines of an academic course. The 35 hours does not include the time necessary to complete the competency checklist.
- Class attendance is mandatory. Any classes missed must be made up at the convenience of the instructor.
- Competently perform three (3) supervised IV medication administrations.
- Competently perform three (3) supervised central line dressing changes.
- Graduates of the course will receive a "Certificate of Completion."
- The Advanced IV Therapy Course for LPNs shall be revised and updated by the WSBN as necessary.

**FACULTY QUALIFICATIONS:**
- Hold a current license to practice as a registered professional nurse (RN) in Wyoming. (Registered in at least one state if employed in a federal institution.),
- A currently licensed RN who has had recent experience in performing IV therapy may be utilized to provide clinical supervision and assist in classroom teaching.

**STUDENT QUALIFICATIONS:**
- Participants must possess a current unencumbered LPN license in the State of Wyoming.
Successfully passed the basic IV therapy course for LPNs within the past two years, or have documented competency in clinical (IV) practice. "Documented competency" means successful completion of the checklist attached to the Curriculum for the Basic IV Therapy Course for LPNs.

**COURSE OUTLINE:**
The following subject areas being tested will include:

**UNITS OF INSTRUCTION:**
UNIT I: Define the Wyoming State Board Advisory Opinion and the legal implications for LPN's in this advanced role
UNIT II: Review of A&P of the Adult Circulatory system
UNIT III: Review Fluid & Electrolyte Balance
UNIT IV: Principles of Pharmacology
UNIT V: Clinical Application

**COURSE EVALUATION CRITERIA:**
1. Teaching methods to include classroom lectures, demonstration, simulation, return demonstration, supervised clinical practice, and classroom and clinical performance evaluations.
2. A comprehensive final examination will be given in addition to occasional quizzes. A final practicum examination will be given.

**NOTE:** Students are responsible for notifying the instructor prior to examination if unable to take a scheduled test.

### UNIT I: Advanced IV Therapy LPNs includes the Advisory Opinion and Legal Implications

<table>
<thead>
<tr>
<th><strong>OBJECTIVES</strong></th>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
</table>
| Identify the requirements each student must meet in order to successfully complete this course. | Course Requirements  
- Length of course  
- Satisfactory completion  
- Attendance  
- Evaluation  
- Certificate of completion  
- IV medication administration  
- Central line management |
| Identify two (2) considerations in each of the following regarding IV therapy and the scope of practice for the LPN: Wyoming NPA; health care facility policies; job description. | Scope of Practice  
- Health care facility policies and procedures  
- Job description  
- Liability including insurance |
| State the general legal consideration governing the practice of LPNs in the State of Wyoming. Contrast the legal responsibilities of the LPN before and after completion of the Advanced IV Therapy Course in regard to the nurse, to the patient, to the physician, to the community, and to the institution. | Guidelines of Functions and Duties LPNs MAY perform, as stated in the LPN Basic & Advanced IV Therapy Scope of Practice Advisory Opinion |
| Identify four (4) essential considerations in obtaining liability-malpractice insurance. | |

### UNIT II: Review of Anatomy & Physiology of Adult Circulatory System

<table>
<thead>
<tr>
<th><strong>OBJECTIVES</strong></th>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the anatomy &amp; physiology of the adult</td>
<td>I. Overview of the circulatory system</td>
</tr>
</tbody>
</table>


| circulatory system. | • Components of the system  
|                     | • Function  
|                     | • Composition  

Trace the blood flow through the heart and lungs and identify-placement of central lines.  

II. Cardiac Cycle  
• Heart  
• Conduction system

UNIT III: Fluid and Electrolyte Balance

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Describe the effects of isotonic, hypertonic and hypotonic IV fluids in the body. | I. BODY FLUIDS  
| | • Major fluid compartments  
| | • Body electrolytes  
| | • Physiological process of fluid and electrolyte balance |

Give the normal range of pH.  

II. Regulatory Mechanisms  
• Renal  
• Endocrine  
• Cardiovascular  
• Respiratory

Discuss the effects of acid-base imbalance  

III. Assessing Fluid and Electrolyte Balance  
• pH  
• Acid-base imbalance  
• Laboratory values

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

IV. Review of treatment of electrolyte imbalances  
IV fluids

Discuss the nursing responsibilities in monitoring and nursing assessments e.g.: intake and output, weight, fluid overload, lab values, peaks and valleys.  

V. TPN

UNIT IV: Principles of Pharmacology

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Review IV medications, normal dosage, actions and adverse effects. | I. IV medications commonly given  
| | • Types  
| | • Dosage ranges  
| | • Desired drug action and pharmacological effects  
| | • Proper administration  
| | • Adverse effects |

Discuss LPN scope of practice regarding IV medication administration.  

II. Common drugs an LPN can administer  
• Legal implications "know your scope of practice"

Demonstrate, verbally and in writing, knowledge of IV drug and fluid incompatibilities.  

III. Incompatibilities  
• Give scenarios and discuss nursing actions

UNIT V: 6 hour Clinical Application

OBJECTIVES: (Also See Checklist)
<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CRITICAL CRITERIA FOR PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate IV medication administration</td>
<td>• Checking physician order&lt;br&gt;• Drawing up medication&lt;br&gt;• Verbalizing knowledge of drug dosage and action&lt;br&gt;• Adverse effects and incompatibilities</td>
</tr>
<tr>
<td>Demonstrate central line access with two different ports of entry</td>
<td>• Sterile technique&lt;br&gt;• Selection of equipment&lt;br&gt;• Assessment of site for signs of complications&lt;br&gt;• Flushing of a central line</td>
</tr>
<tr>
<td>Demonstrate central line site care</td>
<td>• Dressing removal&lt;br&gt;• Site inspection&lt;br&gt;• Site cleansing&lt;br&gt;• Application of sterile occlusive dressing (per facility protocol)</td>
</tr>
<tr>
<td>Identify complications associated with central lines and appropriate nursing actions</td>
<td>• Infection&lt;br&gt;• Pneumothorax&lt;br&gt;• Hemothorax&lt;br&gt;• Vessel perforation&lt;br&gt;• Cardiac perforation&lt;br&gt;• Cardiac tamponade&lt;br&gt;• Dysrhythmia&lt;br&gt;• Air embolus&lt;br&gt;• Sheared catheter</td>
</tr>
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</table>

Application of information from Units I through IV

**CRITICAL CRITERIA FOR CLINICAL PRACTICUM**

**Advanced IV Therapy for LPNs**

<table>
<thead>
<tr>
<th>Student’s Name:</th>
<th>Faculty Name:</th>
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<tbody>
<tr>
<td>A. Aseptic Technique</td>
<td></td>
</tr>
<tr>
<td>• Maintain aseptic technique at all times throughout preparation, insertion procedure, device securement, &amp; accessing the line</td>
<td></td>
</tr>
<tr>
<td>• Perform hand hygiene before procedure&lt;br&gt;• Wear gloves during insertion &amp; securement, as well as at any time exposure to bloodborne pathogens is possible</td>
<td></td>
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<tr>
<td>B. Gather Equipment</td>
<td></td>
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<tr>
<td>• Gloves&lt;br&gt;• Sterile disposable I.V. infusion set&lt;br&gt;• Safety IV catheter of appropriate gauge size for required therapy&lt;br&gt;• Arm board (PRN per facility protocol depending on age &amp; mental status of patient&lt;br&gt;• Disposable tourniquet&lt;br&gt;• Agency approved skin preparation solution&lt;br&gt;• Agency approved catheter stabilization dressing&lt;br&gt;• Tape (IV start kit may be substituted for individual components&lt;br&gt;• Prescribed solution</td>
<td></td>
</tr>
<tr>
<td>• All equipment for IV insertion &amp; medication administration is SINGLE PATIENT USE ONLY</td>
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</tbody>
</table>
### C. Preparation of solution
- Verify doctor’s orders
- Check solution for particulate matter and discoloration
- Check containers for leaks and cracks
- Check expiration date on solution
- Check for vacuum at time seal is broken
- Use equipment appropriate to solution container

### D. Assemble I.V. Equipment
- Unwrap and inspect IV tubing
- Clamp tubing, uncap spike & insert into solution container
- Squeeze drip chamber
- Release drip chamber and invert IV tubing
- Open clamp and fill tubing
- Check for and remove any air bubbles
- Load infusion pump, if used, appropriately

### E. Venipuncture
- Wash hands before procedure, don gloves
- Verify client using 2 patient identifiers
- Verify any allergies
- Prepare client for procedure, obtain verbal consent to proceed
- Assure all necessary equipment is available at bedside
- Place tourniquet 6-12” above intended insertion site
- Select most appropriate distal venous site
- Use appropriate technique to dilate or distend vein
- Prepare area with facility approved antiseptic agent, maintain aseptic technique at all times
- Provide a minimum 30 second aseptic scrub to insertion site
- Insert device using correct method, advance catheter to hub, occlude vessel above catheter (to control blood flow) & activate safety mechanism to remove needle from working area
- Dress insertion site appropriately
- Remove the tourniquet, apply extension set PRN per facility protocol
- Attach catheter to end of tubing or extension set using aseptic technique
- Stabilize extremity as needed using arm board or other supportive devices
- Calculate infusion rate correctly
- Adjust flow rate to specified infusion rate or enter correct pump settings for infusion
- Use appropriate comfort measures

### F. Skills checklist. Important Steps in Care of Client
- Flush with appropriate flush solution before AND after medication infusion to prevent catheter occlusion. Clamp line after infusion if indicated in facility protocol.
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- Check tip integrity of catheter upon removal from client, respond appropriately if catheter is compromised
- Document as required in facility protocol, with a minimum entry of gauge device placed, date/time, how client tolerated procedure & instructions given (on insertion and discontinuation of line)

### G. Central Line Dressing Change

- Perform hand hygiene
- Verify client using 2 identifiers, obtain allergy information to dressing or tape products
- Obtain needed supplies, either a dressing change kit or individual components
- Don gloves, secure line to prevent inadvertent removal
- Remove old dressing starting at area most distal to insertion site & pull off dressing carefully toward insertion site; removed securement device, if used
- Observe insertion site and surrounding skin for S/S infection and skin integrity, remove contaminated gloves
- Open dressing change kit and/or supplies in an aseptic manner, don sterile gloves
- Cleanse skin using facility approved antiseptic solution (chlorhexidine recommended), making sure to scrub entire skin area to be under the new dressing. A minimum of 30 second scrub is necessary or per manufacturer’s guidelines using a back and forth motion.
- Allow antiseptic to completely air dry prior to dressing placement. Does not touch newly cleansed site or compromise sterile field (including supplies AND insertion site)
- Apply securement device using sterile technique, if used and antimicrobial patch if designated in facility protocol
- Apply an occlusive dressing per facility protocol, which allows visualization of insertion site for complications, provide at a minimum documentation on the dressing of date of change
- Able to state facility protocol for dressing change intervals
- For PICC lines, any external catheter should be covered in its entirety with a sterile, occlusive transparent dressing
- Secure line as appropriate outside of sterile dressing
- Remove gloves, perform hand hygiene
- Document procedure per facility protocol in patient record

### RESOURCES:
- Wyoming NPA
- WSBN Administrative Rules and Regulations
- Individual Health Care Facility Policy and Procedure Manual
- Job Description – LPN (provided by facility)
- Creighton, H., Law Every Nurse Should Know
- Selected bibliographical materials as follows: