



***Module 3: Acute Care Peritoneal Dialysis Orientation
Manual and Assessment Tools***

Anatomy and Physiology

It is essential that the nurse working in nephrology has a basic understanding of the anatomy and physiology of the kidney. The kidney is responsible for filtering the blood and removing waste products of metabolism as well as playing a major role in blood pressure regulation, acid-base balance, hormonal responses, and drug metabolism.

Organ cross talk involving the kidney affects multiple systems in the acutely ill patient. It is important for the nurse to understand this feedback system to evaluate the patient's response and formulate a comprehensive plan of care.

Goals

At the completion of this chapter, the nephrology nurse in the acute care setting will be able to:

- Identify gross anatomy components of the kidney.
- Identify internal structures and functions of the nephron.
- Identify roles of the kidney.
- Discuss kinetics related to peritoneal dialysis therapy.

_____ has met the skills and requirements of this chapter.

Date: _____ Preceptor: _____

Additional Readings

Dutka, P., & Szromba, C. (2011). Pathophysiology. In C. Counts (Ed.), *Core curriculum for nephrology nursing* (6th edition, pp. 52- 90). Pitman, NJ: American Nephrology Nurses Association.

Groenhoff, C.L., Ales, L. & Todd, L.B. (2015) Peritoneal dialysis therapy. In C. Counts (Ed.), *Core curriculum for nephrology nursing: Module 3. Treatment options for patients with chronic kidney failure* (6th edition, pp 240-267). Pitman, NJ: American Nephrology Nurses Association

Groetin, C.L., Ales, L., & Todd, L.B. (2011). Peritoneal dialysis therapy. In C. Counts (Ed.), *Core curriculum for nephrology nursing* (6th edition, pp. 240-266). Pitman, NJ American Nephrology Nurses Association.

Guest, S. (2010). *Handbook of peritoneal dialysis*. Lexington, KY: Author.

Headley, C.M. (2011) Anatomy and physiology. In C. Counts (Ed.), *Core Curriculum for nephrology nursing* (6th edition, pp. 25-52). Pitman, NJ: American Nephrology Nurses Association.

Lambertson, K. (2015) Peritoneal dialysis access therapy. In C. Counts (Ed.), *Core curriculum for nephrology nursing* (6th ed., pp 231-240) Pitman, NJ: American Nephrology Nurses Association.

Li, X., Hassoun, H.T., Santora, R., & Rabb. H. (2009). Organ cross talk: Yhe role of the kidney, *Current Opinion in Critical Care*, 15(6), 481-487.

Yaklin, K.M. (2011). Acute kidney injury: An overview of pathophysiology and treatments. *Nephrology Nursing Journal*, 38(1), 13-19, 30.



Anatomy and Physiology Skills Checklist

The orientee is able to:

Self-Assessment	Topic	Date Introduced/ Reinforced	Date Met	Method	Orientation Level Achieved	Preceptor Initials
Identify Gross Anatomy Components of the Kidney						
	Capsule					
	Cortex					
	Medulla					
	<ul style="list-style-type: none"> • Pyramids 					
	<ul style="list-style-type: none"> • Renal column 					
	<ul style="list-style-type: none"> • Loops of Henle 					
	<ul style="list-style-type: none"> • Vasa recta 					
	<ul style="list-style-type: none"> • Medullary collecting ducts 					
	Calyces					
	<ul style="list-style-type: none"> • Minor calyces 					
	<ul style="list-style-type: none"> • Major calyces 					
	Ureters					
	Bladder					
	Urethra					
	Blood supply					
	Lymph drainage					
Identify Internal Structures and Functions of the Nephron						
	Glomerulus (GFR)					
	Cortical nephrons					



Anatomy and Physiology Skills Checklist

The orientee is able to:

Self-Assessment	Topic	Date Introduced/ Reinforced	Date Met	Method	Orientation Level Achieved	Preceptor Initials
	Juxtamedullary nephrons					
	Vascular components					
	Tubular components					
Identify Roles of the Kidney						
	Waste removal					
	Fluid and electrolyte balance					
	Acid-base balance					
	Blood pressure regulation					
	Hormonal influences					
	AKI and distant organ cross talk					
	• Liver					
	• Lung					
	• Brain					
	• Heart					
	• Other organs					
Discuss Kinetics Related to Peritoneal Dialysis Therapy						
	Peritoneal membrane					
	• Visceral					
	• Mesothelium					
	• Omentum					



Anatomy and Physiology Skills Checklist

The orientee is able to:

Self-Assessment	Topic	Date Introduced/ Reinforced	Date Met	Method	Orientation Level Achieved	Preceptor Initials
	• Parietal					
	• Surface area					
	Diffusion					
	• Small solute transport					
	Osmosis					
	• Osmotic forces					
	Ultrafiltration					
	Convection					
	• Solute drag					
	• Middle molecules					
	Drug transport					
	• Insulin					
	• Antibiotics					
	Hydrostatic forces					
	Colloid/crystalloid gradient					
	Intra-abdominal pressure					
	Equilibrium					
	Reabsorption					
	3 pore model					
	• Peritoneal capillary – main barrier to solute transport					
	• Aquaporins					
	• Small pores					



Anatomy and Physiology Skills Checklist

The orientee is able to:

Self-Assessment	Topic	Date Introduced/ Reinforced	Date Met	Method	Orientation Level Achieved	Preceptor Initials
	<ul style="list-style-type: none"> Large pores 					
	Drug transport					
	Strategies for preserving residual renal function					

Keys

<p>Key for Self-Assessment 0 = Have not performed and/or unfamiliar with item 1 = Performed less than 5 times or have some knowledge and need additional instruction 2 = Performed more than 5 times and/or have sufficient knowledge and feel confident to perform independently</p>	<p>Key for Method CR = Chart Review Ex = Written Exam O = Observation S = Simulation V = Verbalization RD = Return Demonstration</p>	<p>Key for Orientation Level Achieved N = Novice AB = Advanced Beginner C = Competent P = Proficient E = Expert</p>
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Principles

Dialysis is a life-saving therapy. It must be done safely, accurately, and with the adjustment of treatment parameters to treat the specific needs of each patient. The nephrology nurse must understand the basic principles of dialysis to provide safe and effective treatment for the patient. The principles of dialysis are universal and do not change from one manufacturer to another or from one company's policies to another. Techniques may vary depending on equipment and practice patterns, but the principles remain the same. A comprehensive understanding and application of those principles are essential to provide safe, effective, quality care.

Goals

Upon completion of this chapter, the nephrology nurse in the acute care setting will be able to:

- Discuss and describe the principles of peritoneal dialysis.
- Describe the role of dialysis solution.

_____ has met the skills and requirements of this chapter.

Date: _____ Preceptor: _____

Additional Readings

- King, B. (2008). Principles of hemodialysis. In C. Counts (Ed.), *Core curriculum for nephrology nursing* (5th ed., pp 662-674). Pitman, NJ: American Nephrology Nurses Association.
- Latham, C.F. (2006). Hemodialysis technology. In A. Molzahn (Ed.), *Contemporary nephrology nursing: Principles and practice* (2nd ed., pp 531-551). Pitman, NJ: American Nephrology Nurses Association.



Principles Skills Checklist

The orientee is able to:

Self-Assessment	Topic	Date Introduced/ Reinforced	Date Met	Method	Orientation Level Achieved	Preceptor Initials
Discuss and Describe Basic Principles of Peritoneal Dialysis						
	Diffusion of solute across a semi-permeable membrane					
	Ultrafiltration					
	Osmotic pressure					
	Hydraulic pressure					
	Negative pressure					
	Solute drag/convection					
Describe the Role of Dialysis Solution						
	Solute transfer					
	Effect on electrolytes					
	Fluid removal					

Keys

Key for Self-Assessment

0 = Have not performed and/or unfamiliar with item
 1 = Performed less than 5 times or have some knowledge and need additional instruction
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Key for Method

CR = Chart Review
 Ex = Written Exam
 O = Observation
 S = Simulation
 V = Verbalization
 RD = Return Demonstration

Key for Orientation Level Achieved

N = Novice
 AB = Advanced Beginner
 C = Competent
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