

Vanderbilt University Medical Center
Emergency General Surgery Service
Surgical Residency Rotation and Curriculum

UNIT 2 PHYSIOLOGY

UNIT OBJECTIVES:

1. Demonstrate knowledge of normal and disturbed human physiology causing surgical diseases.
2. Demonstrate knowledge of the effects of age, as reflected in the newborn, infants, children, and the elderly, on the physiologic functions of the major organ systems.
3. Apply physiological knowledge to the clinical and operative management of surgical diseases.

COMPETENCY-BASED KNOWLEDGE OBJECTIVES:

1. Describe concepts of normal physiology, including:
 - a. Fluid mechanics and dynamics
 - b. Hemostasis, coagulation, thrombogenesis, fibrinolysis, DIC
 - c. Wound healing and systemic inflammatory response syndrome
 - d. Response to sepsis, and septic shock
2. In each of the above systems, identify physiologic variations in geriatric, pediatric, immunosuppressed, and pregnant patients.
3. Indicate the normal values of commonly applied clinical tests.
4. Describe the applications of physiologic principles to surgical monitoring and therapy, including the following approaches:
 - a. Application of Swan-Ganz catheters
 - b. Ventilator management
 - c. Renal function studies & indication for renal replacement therapy
 - d. Interpretation of SMA-17 results
 - e. Interpretation of a nutritional profile
5. Describe how aging affects the tests listed in the section immediately above.
6. Describe the abnormal physiology of complex diseases or entities such as:
 - a. Cardiac failure
 - b. Renal failure
 - c. Pulmonary failure
 - d. Immunosuppression
 - e. Malignancy
 - f. Intestinal obstruction
 - g. Malnutrition
 - h. Cardiopulmonary bypass
 - i. Advanced age

COMPETENCY-BASED PERFORMANCE OBJECTIVES:

1. Interpret laboratory tests and clinical findings based upon physiologic concepts.
2. Manage patients with surgical illnesses and/or major physiologic disruptions such as:
 - a. Liver failure
 - b. Malnutrition
 - c. Renal dysfunction

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- d. Hemorrhage
 - e. Cardiopulmonary failure
 - f. Electrolyte imbalance
 - g. Endocrine disorders such as hypo/hyperthyroidism, pheochromocytoma, adrenal cortical hyper/hypofunction, and their effects on Emergency Surgery
 - h. Sepsis
 - i. Shock
 - j. Immunosuppression
 - k. Diabetes
 - l. Advanced age.
3. Adapt treatment plans to reflect physiologic variations in pediatric, geriatric, and pregnant patients.
 4. Utilize clinical findings, laboratory tests, and hemodynamic measurements to alter patient physiology.
 5. Adjust treatment plans in response to abnormal physiologic values.
 6. Identify and formulate treatment plans for real and potential nutritional therapy.
 7. Interpret hemodynamic monitoring and adjust treatment to restore homeostasis:
 - a. Insert and maintain arterial venous and central lines.
 - b. Monitor catheters.
 8. Solve problems interfering with normal hemostasis.
 9. Delineate weaning parameters.