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**Physician Tasks/Competencies**

**Percentage Breakdown:**

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<tr>
<th>System</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Medical Knowledge/Foundational Science Concepts</td>
<td>62%–68%</td>
</tr>
<tr>
<td>Patient Care: Diagnosis</td>
<td>21%–28%</td>
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<tr>
<td>Patient Care: Management</td>
<td>6%–8%</td>
</tr>
<tr>
<td>Communication, Interpersonal Skills, &amp; Professionalism</td>
<td>1%–3%</td>
</tr>
<tr>
<td>Practice-based Learning</td>
<td>2%–4%</td>
</tr>
</tbody>
</table>

**Medical Knowledge/Scientific Concepts**

**Patient Care: Diagnosis**
- History and physical examination
- Laboratory and diagnostic studies
- Diagnosis
- Prognosis/outcome

**Patient Care: Management**
- Health maintenance and disease prevention
- Pharmacotherapy
- Clinical interventions

**Communication, Interpersonal Skills, & Professionalism**

**Practice-based Learning**
- Application of principles of biostatistics
- Population health
- Epidemiology
Content Categories

Percentage Breakdown:

<table>
<thead>
<tr>
<th>System</th>
<th>Range</th>
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<tbody>
<tr>
<td>General Principles of Foundational Science</td>
<td>12%–14%</td>
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<tr>
<td>Immune System</td>
<td>3%–5%</td>
</tr>
<tr>
<td>Blood and Lymphoreticular System</td>
<td>3%–5%</td>
</tr>
<tr>
<td>Nervous System and Special Senses</td>
<td>9%–11%</td>
</tr>
<tr>
<td>Skin and Subcutaneous Tissue</td>
<td>2%–4%</td>
</tr>
<tr>
<td>Musculoskeletal System</td>
<td>5%–7%</td>
</tr>
<tr>
<td>Cardiovascular System</td>
<td>11%–13%</td>
</tr>
<tr>
<td>Respiratory System</td>
<td>7%–9%</td>
</tr>
<tr>
<td>Gastrointestinal System</td>
<td>8%–10%</td>
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<tr>
<td>Renal and Urinary Systems</td>
<td>5%–7%</td>
</tr>
<tr>
<td>Pregnancy, Childbirth, and the Puerperium</td>
<td>2%–4%</td>
</tr>
<tr>
<td>Female Reproductive System &amp; Breast</td>
<td>2%–4%</td>
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<tr>
<td>Male Reproductive System</td>
<td>1%–3%</td>
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<tr>
<td>Endocrine System</td>
<td>5%–7%</td>
</tr>
<tr>
<td>Multisystem Processes &amp; Disorders</td>
<td>8%–10%</td>
</tr>
<tr>
<td>Biostatistics, Epidemiology, and Public/Population Health</td>
<td>2%–4%</td>
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<tr>
<td>Social Sciences</td>
<td>1%–3%</td>
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<table>
<thead>
<tr>
<th>Organ System Processes</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Normal</td>
<td>20%–30%</td>
</tr>
<tr>
<td>Abnormal</td>
<td>70%–80%</td>
</tr>
</tbody>
</table>

General Principles of Foundational Science

Biochemistry and molecular biology

- Gene expression: DNA structure, replication, exchange, and epigenetics
- Gene expression: transcription
- Gene expression: translation, post-translational processing, modifications, and disposition of proteins (degradation)
- Structure and function of proteins and enzymes
- Energy metabolism

Biology of cells

- Adaptive cell responses and cellular homeostasis
- Mechanisms of injury and necrosis, including pathologic processes
- Apoptosis
Cell cycle and cell cycle regulation
Mechanisms of dysregulation
Cell/tissue structure, regulation, and function

**Human Development and genetics**
- Principles of pedigree analysis
- Population genetics: Hardy-Weinberg law, founder effects, mutation-selection equilibrium
- Principles of gene therapy
- Genetic testing and counseling
- Genetic mechanisms

**Biology of tissue response to disease**
- Acute inflammatory responses (patterns of response)
- Chronic inflammatory responses
- Reparative processes

**Pharmacodynamic and pharmacokinetic processes**
- Pharmacokinetics: absorption, distribution, metabolism, excretion, dosage intervals
- Mechanisms of drug action, structure-activity relationships
- Concentration and dose-effect relationships, types of agonists, and antagonists and their actions
- Individual factors altering pharmacokinetics and pharmacodynamics
- Mechanisms of drug adverse effects, overdosage, toxicology
- Mechanisms of drug interactions
- Signal transduction, including structure/function of all components of signal transduction pathways such as receptors, ligands

**Microbial biology**
- Microbial identification and classification
- Bacteria
- Viruses
- Fungi
- Parasites
Prions

**Immune System**

**Normal Processes**

- Development of cells of the adaptive immune response
- Structure, production, and function
- Cellular basis of the immune response and immunologic mediators
- Basis of immunologic protection
- Effect of age on the function of components of the immune system

**Abnormal Processes**

- Disorders associated with immunodeficiency
- HIV/AIDS
- Immunologically mediated disorders
- Adverse effects of drugs on the immune system

**Blood and Lymphoreticular System**

**Normal Processes**

- Embryonic development, fetal maturation, and perinatal changes
- Organ structure and function
- Cell/tissue structure and function
- Repair, regeneration, and changes associated with stage of life

**Abnormal Processes**

- Infectious and immunologic
- Neoplasms
- Anemia, cytopenias, and polycythemia
- Coagulation disorders (hypocoagulable and hypercoagulable conditions)
- Traumatic, mechanical, and vascular disorders
- Congenital disorders
- Adverse effects of drugs on the hematologic and lymphoreticular systems
Nervous System and Special Senses

Normal Processes

Embryonic development, fetal maturation, and perinatal changes

Organ structure and function

Cell/tissue structure and function, including neuronal cellular and molecular biology

Repair, regeneration, and changes associated with stage of life

Abnormal Processes

Infectious, immunologic, and inflammatory disorders

Neoplasms (cerebral, spinal, and peripheral)

Cerebrovascular disease

Disorders relating to the spine, spinal cord, and spinal nerve roots

Cranial and peripheral nerve disorders

Neurologic pain syndromes

Degenerative disorders/amnestic syndromes

Global cerebral dysfunction

Neuromuscular disorders

Movement disorders

Metabolic disorders

Paroxysmal disorders

Sleep disorders

Traumatic and mechanical disorders and disorders of increase intracranial pressure

Congenital disorders

Adverse effects of drugs on the nervous system

Disorders of the eye and eyelid

Disorders of the ear
**Skin and Subcutaneous Tissue**

**Normal Processes**

- Embryonic development, fetal maturation, and neonatal changes
- Organ structure and function, including barrier function, thermal regulation
- Cell/tissue structure and function, eccrine function
- Repair, regeneration, and changes associated with stage of life
- Skin defense mechanisms and normal flora

**Abnormal Processes**

- Infectious, immunologic, and inflammatory disorders
- Neoplasms
- Adnexal disorders (hair and hair follicles, nails, sweat glands, sebaceous glands, oral mucous membranes)
- Oral disease
- Disorders of pigmentation
- Traumatic and mechanical disorders
- Congenital disorders
- Adverse effects of drugs on skin and subcutaneous tissue

**Musculoskeletal System**

**Normal Processes**

- Embryonic development, fetal maturation, and perinatal changes
- Organ structure and function
- Cell/tissue structure and function
- Repair, regeneration, and changes associated with stage of life

**Abnormal Processes**

- Infectious, inflammatory, and immunologic disorders
- Neoplasms
Degenerative and metabolic disorders
Traumatic and mechanical disorders
Congenital disorders
Adverse effects of drugs on the musculoskeletal system

**Cardiovascular System**

**Normal Processes**

Embryonic development, fetal maturation, and perinatal transitional changes
Organ structure and function
Cell/tissue structure and function
Repair, regeneration, and changes associated with stage of life

**Abnormal Processes**

Infectious, immunologic, and inflammatory disorders
Neoplasms
Dysrhythmias
Heart failure
Ischemic heart disease
Diseases of the myocardium
Disease of the pericardium
Valvular heart disease
Hypotension
Hypertension
Dyslipidemia
Vascular disorders
Traumatic and mechanical disorders
Congenital disorders, including disease in adults
Adverse effects of drugs on the cardiovascular system
Respiratory System

Normal Processes

Embryonic development, fetal maturation, and perinatal changes
Organ structure and function
Cell/tissue structure and function, including surfactant formation, and alveolar structure
Repair, regeneration, and changes associated with stage of life
Pulmonary defense mechanisms and normal flora

Abnormal Processes

Infectious, immunologic, and inflammatory disorders
Neoplasms
Obstructive airway disease
Pneumoconiosis/fibrosing/restrictive pulmonary disorders/interstitial lung disease
Respiratory failure/respiratory arrest and pulmonary vascular disorders
Metabolic, regulatory, and structural disorders
Disorders of the pleura, mediastinum, and chest wall
Traumatic and mechanical disorders
Congenital disorders
Adverse effects of drugs on the respiratory system

Gastrointestinal System

Normal Processes

Embryonic development, fetal maturation, and perinatal changes
Organ structure and function
Cell/tissue structure and function
Repair, regeneration, and changes associated with stage of life
Gastrointestinal defense mechanisms and normal flora

Abnormal Processes

Infectious, immunological, and inflammatory disorders
Neoplasms
Signs, symptoms, and ill-defined disorders
Disorders of the oral cavity, salivary glands, and esophagus
Disorders of the stomach, small intestine, colon, rectum, and anus
Disorders of the liver and biliary system, noninfectious
Disorders of the pancreas
Disorders of the peritoneal cavity
Traumatic and mechanical disorders
Congenital disorders
Adverse effects of drugs on the gastrointestinal system

Renal and Urinary Systems
Normal Processes
Embryonic development, fetal maturation, and perinatal changes
Organ structure and function
Cell/tissue structure and function
Repair, regeneration, and changes associated with stage of life

Abnormal Processes
Infectious, immunologic, and inflammatory disorders
Neoplasms
Signs, symptoms, and ill-defined disorders
Metabolic and regulatory disorders
Vascular disorders
Traumatic and mechanical disorders
Congenital disorders
Adverse effects of drugs on the renal and urinary system
Pregnancy, Childbirth, and the Puerperium

Normal Processes

Organ structure and function: pregnancy

Abnormal Processes

Prenatal care
Obstetric complications
Labor and delivery
Puerperium, including complications
Newborn (birth to 4 weeks of age)
Congenital disorders, neonatal
Adverse effects of drugs on pregnancy, childbirth, and the puerperium
Systemic disorders affecting pregnancy, labor and delivery, and puerperium

Female Reproductive System & Breast

Normal Processes

Embryonic development, fetal maturation, and perinatal changes
Organ structure and function
Cell/tissue structure and function
Reproductive system defense mechanisms and normal flora
Repair, regeneration, and changes associated with stage of life

Abnormal Processes

Infectious, immunologic, and inflammatory disorders
Neoplasms of the breast, cervix, ovary, uterus, vagina, and vulva
Fertility and infertility
Menopause
Menstrual and endocrine disorders
Sexual dysfunction
Traumatic and mechanical disorders
Congenital disorders

Adverse effects of drugs on the female reproductive system and breast

**Male Reproductive System**

*Normal Processes*

- Embryonic development, fetal maturation, and perinatal changes
- Organ structure and function
- Cell/tissue structure and function
- Reproductive system defense mechanisms and normal flora
- Repair, regeneration, and changes associated with stage of life

*Abnormal Processes*

- Infectious, immunologic, and inflammatory disorders
- Neoplasms
- Metabolic and regulatory disorders, including sexual dysfunction
- Traumatic and mechanical disorders
- Congenital disorders
- Adverse effects of drugs on the male reproductive system

**Endocrine System**

*Normal Processes*

- Embryonic development, fetal maturation, and perinatal changes
- Organ structure and function
- Cell/tissue/structure and function
- Repair, regeneration, and changes associated with stage of life

*Abnormal Processes*

- Diabetes mellitus and other disorders of the endocrine pancreas
- Thyroid disorders
- Parathyroid disorders
Adrenal disorders
Pituitary disorders
Hypothalamic endocrine disorders
Multiple endocrine neoplasia (MEN1, MEN2)
Congenital disorders
Adverse effects of drugs on the endocrine system

**Multisystem Processes & Disorders**

**Normal Processes**

Principles of nutrition
Electrolyte and water metabolisms
Intracellular accumulations

**Abnormal Processes**

Infectious, immunologic, and inflammatory disorders
Neoplasms and related disorders
Signs, symptoms, and ill-defined disorders
Nutrition
Toxins and environmental extremes
Venomous bites and stings
Fluid, electrolyte, and acid-base balance disorders
Abuse
Multiple trauma (e.g., prioritization, blast injury)
Shock, cardiogenic, hypovolemic, neurogenic, septic; sepsis, bacteremia, systemic inflammatory response syndrome (SIRS), refractory, multiorgan dysfunction syndrome
Genetic metabolic and developmental disorders
Adverse effects of drugs on multisystem disorders
Biostatistics, Epidemiology/Population Health, and Interpretation of the Medical Literature

- Epidemiology and public/population health
- Study design, types and selection of studies
- **Measures of association** (e.g., relative risk, odds ratio, other)
- **Distributions of data** (e.g., normal distribution, regression to mean)
- **Correlation and regression, uses and interpretation**
- **Principles of testing and screening** (e.g., sensitivity and specificity, predictive value, probability)
- **Study interpretation** (e.g., causation, validity, statistical vs. clinical significance)

Social Sciences

- Communication and interpersonal skills, including patient interviewing, consultation, and interactions with the family (patient-centered communication skills)
- **Medical ethics and jurisprudence**
  - Consent to treatment/decision-making capacity
  - Death and dying and palliative care
  - Physician-patient relationship
  - Professional conduct/integrity