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**Physician Tasks/Competencies**

**Percentage Breakdown:**

<table>
<thead>
<tr>
<th>System</th>
<th>Range</th>
</tr>
</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>
</tr>
<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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</thead>
<tbody>
<tr>
<td>General Principles of Foundational Science</td>
<td>12%–14%</td>
</tr>
<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>
</tr>
<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>
</tr>
<tr>
<td>Male Reproductive System</td>
<td>1%–3%</td>
</tr>
<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>
</tr>
<tr>
<td>Social Sciences</td>
<td>1%–3%</td>
</tr>
</tbody>
</table>

### Organ System Processes

<table>
<thead>
<tr>
<th>Process</th>
<th>Range</th>
</tr>
</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
- 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
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