Physiology

Here is a structured **tabular format** categorizing **physiology-specific content** from the document, organized by system:

System	Physiological Processes	Physiological Dysfunctions & Disorders
General Physiology	- Homeostasis and feedback mechanisms (positive & negative) - Membrane transport (diffusion, osmosis, active transport) - Cell signaling and second messengers - Thermoregulation - Fluid compartments and electrolyte balance	- Dehydration and fluid imbalances - Electrolyte disturbances (hyper/hyponatremia, hyper/hypokalemia) - Acid-base disorders (acidosis, alkalosis)
Hematopoietic & Lymphoreticular	- Erythropoiesis and hemoglobin function - Hemostasis and coagulation cascade - Immune response and lymphatic circulation	- Anemia (iron deficiency, pernicious, hemolytic) - Clotting disorders (hemophilia, DIC) - Immune deficiencies (SCID, HIV/AIDS)
Central & Peripheral Nervous	- Neural conduction (action potentials, synaptic transmission) - Autonomic nervous system (sympathetic vs. parasympathetic) - Sensory and motor function - Neurotransmitter systems (dopamine, serotonin, GABA) - Sleep-wake regulation and circadian rhythms	- Epilepsy (abnormal neuronal firing) - Neurodegenerative disorders (Alzheimer's, Parkinson's) - Autonomic dysfunction (orthostatic hypotension) - Sleep disorders (insomnia, narcolepsy)
Skin & Connective Tissue	- Thermoregulation and sweat gland function - Wound healing and tissue regeneration - Skin barrier function and vitamin D synthesis	- Hyperthermia, hypothermia - Delayed wound healing (diabetes, malnutrition) - Skin infections and barrier dysfunction
Musculoskeletal	- Muscle contraction (actin-myosin interaction, ATP usage) - Neuromuscular junction and excitation-contraction coupling - Bone remodeling and calcium homeostasis	- Muscular dystrophies (Duchenne, Becker) - Myasthenia gravis (neuromuscular junction disorder) - Osteoporosis, osteomalacia
Respiratory	- Mechanics of breathing (inspiration, expiration) - Gas exchange and transport (oxygen, CO2) - Ventilation-perfusion matching (V/Q ratio) - Control of respiration (chemoreceptors, brainstem centers)	- Respiratory acidosis/alkalosis - Chronic obstructive pulmonary disease (COPD) - Hypoxia (altitude sickness, lung disease) - Sleep apnea
Cardiovascular	- Cardiac cycle and hemodynamics - Blood pressure regulation (baroreceptors, RAAS system) - Electrical conduction of the heart (SA node, AV node, Purkinje fibers) - Capillary exchange and microcirculation	- Hypertension, hypotension - Arrhythmias (atrial fibrillation, ventricular tachycardia) - Heart failure (systolic vs. diastolic) - Shock (cardiogenic, hypovolemic)
Gastrointestinal	- Motility (peristalsis, segmentation) - Digestion and enzyme activity - Absorption of nutrients and water - Hormonal regulation (gastrin, secretin, CCK) - Gut microbiome and immunity	- Gastroesophageal reflux disease (GERD) - Malabsorption syndromes (celiac disease, Crohn's) - Peptic ulcers - Irritable bowel syndrome (IBS)
Renal/Urinary	- Glomerular filtration and renal blood flow - Tubular reabsorption and secretion - Urine concentration and osmoregulation - Acid-base balance	- Acute and chronic kidney disease - Renal tubular acidosis - Hyponatremia, hyperkalemia - Nephrotic and nephritic syndromes
Reproductive	- Hypothalamic-pituitary-gonadal axis - Gametogenesis (spermatogenesis, oogenesis) -	- Infertility (hormonal imbalances, structural abnormalities) - Polycystic ovary syndrome

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	Fertilization, implantation, and pregnancy physiology - Lactation and hormonal control	(PCOS) - Erectile dysfunction - Menopausal symptoms
Endocrine	- Hormonal signaling and feedback mechanisms - Glucose homeostasis (insulin, glucagon) - Thyroid hormone synthesis and action - Adrenal gland function (cortisol, aldosterone)	- Diabetes mellitus (Type 1, Type 2) - Hypothyroidism (Hashimoto's), hyperthyroidism (Graves) - Addison's disease, Cushing's syndrome - Obesity and metabolic syndrome