

## ADAPTABLE FRAMEWORK OF STANDARDS FOR NUTRITION IN MEDICAL EDUCATION

All medical students should graduate with the knowledge required to explain how food and nutrition influence health and disease. They should be equipped to recognize nutritional risk, deficit, and excess in their patients. New doctors should be competent in the role of nutrition in prevention and treatment of acute and chronic diseases in order to advise patients about lifestyle strategies for dietary change, in particular as it relates to common conditions such as malnutrition, heart disease, diabetes, and obesity.

BASIC NUTRITION PRINCIPLES AND PRACTICE SKILLS	
<b>NUTRITION FUNDAMENTALS</b>	
	<p>Nutrient Metabolism</p> <ol style="list-style-type: none"> <li>1. Describe the digestion, absorption and metabolism of proteins, fats, and carbohydrates in health and disease</li> <li>2. Describe the absorption and functions of essential micronutrients</li> <li>3. Recognize deficiency syndromes of vitamins and minerals</li> <li>4. Recognize signs and symptoms of vitamin and mineral excess</li> <li>5. Differentiate nutrient metabolism in starvation versus response to metabolic stress, infection, or disease</li> <li>6. Identify standards for nutrient adequacy</li> </ol>
	<p>Energy Regulation and Energy Balance</p> <ol style="list-style-type: none"> <li>1. Describe normal regulation of energy balance and influencing factors               <ol style="list-style-type: none"> <li>a. Physiologic</li> <li>b. Environmental</li> <li>c. Social</li> </ol> </li> </ol>
<b>NUTRITION ASSESSMENT</b>	
	<p>Anthropometrics</p> <ol style="list-style-type: none"> <li>1. Assess basic anthropometrics               <ol style="list-style-type: none"> <li>a. height/length</li> <li>b. weight</li> <li>c. body mass index</li> <li>d. waist circumference (adolescents/adults)</li> <li>e. midarm muscle circumference</li> <li>f. midarm muscle area</li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>g. head circumference (infants)</li> <li>2. Understand principles of body composition and identify common methods utilized to assess body composition</li> </ul>
	<p>Biochemical</p> <ul style="list-style-type: none"> <li>1. Use appropriate biochemical tests to assess nutritional status and diagnose nutrient deficiency or excess <ul style="list-style-type: none"> <li>a. Accurately interpret results in the context of health or disease</li> </ul> </li> </ul>
	<p>Clinical</p> <ul style="list-style-type: none"> <li>1. Recognize nutritional risk factors including those from medical, family, and social histories <ul style="list-style-type: none"> <li>a. Incorporate nutrition questions into Review of Systems</li> </ul> </li> <li>2. Perform nutrition-focused physical examination and assess for signs of macronutrient and micronutrient deficiency</li> <li>3. Differentiate between the interventions required for acutely ill patients as compared to healthy or chronically ill patients.</li> </ul>
	<p>Dietary</p> <ul style="list-style-type: none"> <li>1. Collect a diet history and assess adequacy as it relates to clinical situations</li> </ul>
	<p>Physical Activity</p> <ul style="list-style-type: none"> <li>1. Take a physical activity history and assess contribution to health or disease</li> </ul>
	<p>Malnutrition</p> <ul style="list-style-type: none"> <li>1. Describe and recognize various malnutrition syndromes as per World Health Organization and local standards</li> <li>2. Describe, identify, and propose treatment plan for refeeding syndrome</li> </ul>
	<p>Nutrient Requirements</p> <ul style="list-style-type: none"> <li>1. Determine nutrient requirements across the lifecycle using current evidenced based resources</li> </ul>
<b>PUBLIC HEALTH</b>	
	<p>Nutritional Prevention and Treatment of Communicable and Non-Communicable Diseases</p> <ul style="list-style-type: none"> <li>1. Recognize social, environmental, and cultural influences on food choice and dietary patterns</li> <li>2. Recognize societal and policy influence on dietary behaviors, health promotion, and disease prevention, including, but not limited to: <ul style="list-style-type: none"> <li>a. Food security</li> <li>b. Salt iodination</li> <li>c. Oral rehydration therapy</li> <li>d. Vitamin A prophylaxis and treatment</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>e. Zinc prophylaxis and treatment</li> <li>f. Vitamin K supplementation of neonates</li> </ul> <ol style="list-style-type: none"> <li>3. Recognize the double burden of communicable and non-communicable disease</li> <li>4. Describe the role of nutrition and food safety on public health and the prevention of infectious disease               <ul style="list-style-type: none"> <li>a. Hand washing</li> <li>b. Safe food handling</li> <li>c. Microbial contamination and growth</li> <li>d. Water safety</li> </ul> </li> </ol>
<b>NUTRITION COUNSELING</b>	
	<p>Evidence-based nutrition counseling</p> <ol style="list-style-type: none"> <li>1. Assess client readiness, motivation, and barriers for dietary change</li> <li>2. Provide basic nutrition counseling regarding:           <ul style="list-style-type: none"> <li>a. Health promotion</li> <li>b. Therapeutic diets for common non-communicable disease states such as hypertension, hyperlipidemia, and diabetes</li> <li>c. Therapeutic nutritional interventions for the symptoms of common communicable disease states (e.g. human immunodeficiency virus, malaria, tuberculosis, schistosomiasis, helminths).</li> <li>d. Prevention and treatment of malnutrition and failure to thrive</li> </ul> </li> <li>3. Provide recommendations for referral to a Registered Clinical Dietitian</li> </ol>
<b>NUTRITION RESEARCH</b>	
	<p>Evidence-based Practice</p> <ol style="list-style-type: none"> <li>1. Critically evaluate and interpret reputable research and appropriately apply to clinical practice</li> </ol>
<b>NUTRITION ACROSS THE LIFESPAN</b>	
<b>WOMEN'S HEALTH</b>	
	<ol style="list-style-type: none"> <li>1. Determine energy and nutrient requirements appropriate for a woman's needs pre-conception, during pregnancy and lactation, and post-menopause</li> <li>2. Dietary supplement recommendations</li> <li>3. Breast feeding</li> <li>4. Unique nutrient requirements for each life stage</li> </ol>
<b>PERINATAL NUTRITION</b>	
	<ol style="list-style-type: none"> <li>1. Monitor for appropriate fetal growth and development</li> <li>2. Advise on dietary adjustments or supplements as needed</li> </ol>
<b>INFANT AND PEDIATRIC NUTRITION</b>	

	<ol style="list-style-type: none"> <li>1. Monitor for appropriate growth and development across infancy and childhood</li> <li>2. Determine energy and nutrient requirements appropriate for pre-term infancy, infancy, and childhood</li> <li>3. Provide appropriate counseling needed as it relates to breast feeding versus infant formula, introduction of cow's milk and solid foods               <ol style="list-style-type: none"> <li>a. Timing and types of complementary foods</li> </ol> </li> <li>4. Identify nutrition risk factors common to the infant and pediatric populations</li> </ol>
<b>ADOLESCENT NUTRITION</b>	
	<ol style="list-style-type: none"> <li>1. Determine energy and nutrient requirements unique to adolescent boys and girls</li> <li>2. Identify nutrition risk factors common to the adolescent population</li> </ol>
<b>ADULT NUTRITION</b>	
	<ol style="list-style-type: none"> <li>1. Determine energy and nutrient requirements for the adult individual</li> </ol>
<b>GERIATRIC NUTRITION</b>	
	<ol style="list-style-type: none"> <li>1. Determine energy and nutrient requirements unique to geriatric men and women</li> <li>2. Identify nutrition risk factors common to the geriatric population</li> </ol>
<b>NUTRITION AND ORGAN SYSTEMS</b>	
<b>CARDIOVASCULAR</b>	
	<ol style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of cardiovascular diseases               <ol style="list-style-type: none"> <li>a. Coronary artery and vascular disease</li> <li>b. Hypertension</li> <li>c. Hyperlipidemia and lipid metabolism</li> <li>d. Heart failure/Cardiomyopathy</li> </ol> </li> </ol>
<b>ENDOCRINE/METABOLIC</b>	
	<ol style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of endocrine and metabolic diseases               <ol style="list-style-type: none"> <li>a. Obesity</li> <li>b. Diabetes Mellitus</li> <li>c. Bone disease</li> <li>d. Thyroid disorders</li> </ol> </li> </ol>
<b>GASTROINTESTINAL</b>	
	<ol style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of gastrointestinal diseases               <ol style="list-style-type: none"> <li>a. Oral and dental diseases</li> <li>b. Esophageal disease (e.g. swallowing disorders, Barrett's esophagus)</li> <li>c. Gastroesophageal reflux disease</li> <li>d. Digestive diseases (e.g. pancreatitis)</li> <li>e. Absorptive diseases (e.g. inflammatory bowel disease, biliary disease)</li> </ol> </li> </ol>

	<ul style="list-style-type: none"> <li>f. Laxation</li> <li>g. Peptic ulcer disease</li> <li>h. Food Intolerance</li> </ul>
<b>HEMATOLOGIC/ONCOLOGIC</b>	
	<ul style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of hematologic and oncologic diseases <ul style="list-style-type: none"> <li>a. Cancer</li> <li>b. Nutritional anemias</li> </ul> </li> </ul>
<b>RESPIRATORY</b>	
	<ul style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of pulmonary diseases <ul style="list-style-type: none"> <li>a. Acid base balance</li> </ul> </li> </ul>
<b>RENAL</b>	
	<ul style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of acute and chronic renal diseases <ul style="list-style-type: none"> <li>a. Fluid and electrolyte regulation</li> <li>b. Calcium and phosphorus homeostasis</li> <li>c. Acid base balance</li> </ul> </li> </ul>
<b>IMMUNE</b>	
	<ul style="list-style-type: none"> <li>1. Describe the role of nutrition on prevention and treatment of immune disorders <ul style="list-style-type: none"> <li>a. Food allergy</li> <li>b. Autoimmune diseases (e.g. Celiac disease)</li> </ul> </li> </ul>
<b>NERVOUS SYSTEM</b>	
	<ul style="list-style-type: none"> <li>1. Recognize neurologic or psychiatric disorders that may influence dietary intake (e.g. eating disorders, depression, dementia, stroke)</li> <li>2. Recognize the role of nutrition in the promotion of acute and chronic neuropsychiatric disorders.</li> </ul>
<b>INTEGUMENTARY</b>	
	<ul style="list-style-type: none"> <li>1. Describe the role of nutrition on skin integrity <ul style="list-style-type: none"> <li>a. Identify key nutrients required for proper wound healing</li> </ul> </li> </ul>
<b>OTHER</b>	
<b>NUTRITION SUPPORT</b>	
	<ul style="list-style-type: none"> <li>1. Describe routes, risks, indications, and timing for oral, enteral, and parenteral nutrition support</li> <li>2. Assess risk and benefit of enteral or parenteral nutrition support</li> <li>3. Manage complications of enteral and parenteral nutrition support</li> </ul>
<b>NUTRIENT INTERACTIONS</b>	

	<ol style="list-style-type: none"> <li>1. Identify common drug-nutrient, food-nutrient, and nutrient-nutrient interactions and their potential role on dietary needs or modifications</li> <li>2. Describe the role of alcohol on nutrients, energy balance, and nutrition status</li> </ol>
<b>ETHICS AND PALLIATIVE CARE</b>	
	<ol style="list-style-type: none"> <li>1. Apply principles of ethics to nutrition and palliative care (e.g. nutrition at end of life, artificial nutrition and hydration, etc.)</li> </ol>

Compiled by; Ms Grace Phelan and Dr Bernadette Chimera-Khombe