

Curricular Thread Report: Medical Nutrition

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Reviewed content standards:

NIH: Nutrition Curriculum Guide for Training Physicians (http://www.nhlbi.nih.gov/research/training/naa/products/curr_gde/index.htm)

Nutrition in Medicine: Online Nutrition Modules (<http://nutritioninmedicine.org>)

Nutrition Topics in Medical Schools (http://www.nhlbi.nih.gov/research/training/naa/products/faculty_courses.pdf)

Comparable curricula at other medical schools (University of Central Florida, University of Cincinnati, University of Michigan)

Thread Objectives

Mapped to corresponding Institutional Educational Objectives (IE)

http://www.etsu.edu/com/msec/documents/institutionaleducationalobjectives_latestversion.pdf

Knowledge:

- 1) Understand fundamental principles of nutrition: 2.2
 - a) Define a fuel; name the 3 classes of fuels in the human diet (carbohydrates, fats and protein). Distinguish among the classes according to their structural features and caloric content. 2.2
 - b) Outline the metabolic pathways involved in the generation of energy from fuel oxidation and explain how each pathway is regulated in response to cellular energy demand. 2.2
 - c) Explain the concept of fuel homeostasis and use this concept to explain the changes of blood glucose, fatty acids and amino acid levels that occur in response to variations in timing, quantity, and type of dietary fuel intake and to variations in the intensity or duration of physical exercise. 2.2
 - d) Define calorie, basal metabolic rate, respiratory quotient, and daily energy expenditure, and describe how these values are measured or calculated. Explain how each of these values is related to physical exercise, caloric balance, weight gain or loss, and the rate of fuel metabolism. 2.2
 - e) Outline the pathways for synthesis and degradation of cholesterol, and explain the mechanisms that regulate these pathways in response to cholesterol intake, saturated fat, and other dietary components. 2.2
 - f) Distinguish among the classes of lipoproteins involved in cholesterol and lipid transport in the blood, and explain how different genetic and dietary factors influence lipoprotein concentrations and composition. 2.2
 - g) Distinguish between the two types of dietary fiber, and explain the potential contributions of fiber to health maintenance. 2.2

- h) Define Recommended Dietary Allowance (RDA), Dietary Reference Intake (DRI), Adequate Intake (AI), Estimated Average Requirement (EAR); and Upper Limit (UL); explain how these values are established for different age groups; and identify the population groups to which they apply. [2.2](#), [2.3](#), [3.6](#)
 - i) Using the US Dietary Guidelines and MyPlate, describe the general characteristics of a healthy diet, including the recommended contribution of various food groups, good common sources of individual nutrients, foods to be consumed in limited amounts, and the carbohydrate: fat: protein distribution. [2.3](#), [2.4](#), [3.6](#), [3.10](#)
 - j) Identify types of individuals, populations or communities at risk for specific or general dietary vitamin and mineral deficiencies or imbalances as a result of genetic, environmental, or socio-cultural influences. [2.4](#), [2.5](#), [3.9](#)
- 2) Describe the role of nutrition in health promotion and disease prevention, particularly as related to chronic disease. [2.2](#), [3.10](#)
 - 3) Identify the prevalence of individuals who are overweight, obese, or malnourished in the U.S. [2.4](#), [2.5](#)
 - 4) List food categories in the MyPlate food guide and recommended number of servings in each. [2.2](#), [3.8](#), [3.10](#)
 - 5) List at least three common barriers to dietary change, and identify effective strategies for overcoming these barriers. [2.5](#), [3.10](#)
 - 6) Describe common social, ethnic, cultural, and societal factors that contribute to the prevalence of nutritional problems and should be considered in their management. [2.5](#), [3.9](#)
 - 7) Describe the metabolic and medical consequences of varying degrees of over- and under-nutrition. [2.1](#), [2.2](#)
 - 8) Compare and contrast the “ABCD’s” (anthropometric, biochemical, clinical, and dietary intake measures) of nutrition assessment. [2.1](#), [2.2](#), [2.3](#), [2.4](#)
 - 9) Describe the impact of the altered nutritional status associated with five common acute and five common chronic diseases. [2.2](#), [3.1](#) (not sure 3.1 fits), [3.6](#), [3.9](#)
 - 10) List the laboratory measurements commonly used to assess the nutritional status of patients. [1.2](#), [1.4](#)
 - 11) Describe MyPlate, explain how it could be used as a nutrition assessment tool, and give functional definitions of portion size in each category of MyPlate. [2.2](#), [3.8](#), [3.10](#)
 - 12) Outline a laboratory profile indicative of malnutrition, protein-energy malnutrition, iron deficiency anemia, or megaloblastic anemia. [1.2](#), [1.4](#)
 - 13) Identify the likely physical examination findings associated with over- and under-nutrition and vitamin/mineral deficiencies or toxicities. [1.2](#), [1.4](#)
 - 14) Describe the beneficial effects of physical activity and the detrimental effects of inactivity on the cardiovascular, musculoskeletal, pulmonary, neurological systems. [2.4](#)
 - 15) Identify the relative contribution of basal and resting metabolism, dietary thermogenic influences, and physical activity to the total daily energy expenditure (TDEE). Differentiate between moderate and vigorous activity; classify various physical activities by their energy expenditure rates. [2.2](#)
 - 16) List the four compartments of the body used to determine body composition. Identify different regional patterns of adipose tissue deposition and the influence of caloric intake on body fat. [2.2](#)
 - 17) Describe the cardiovascular and metabolic responses to short-term and long-term physical activity. [2.2](#)

18) Explain how varying levels of physical activity influence an individual's nutritional requirements. 2.2

Skills:

History

19) Take an appropriate patient medical history, including family, social, nutritional/dietary, physical activity, and weight histories; use of prescription medicines, over-the-counter medicines, dietary and herbal supplements; and consumption of alcohol and recreational drugs. 1.1, 1.2

Physical

20) Conduct an appropriate physical examination, including anthropometrics, evaluation of growth and development and signs of nutritional deficiency or excess. 1.1, 1.2

Test Selection

21) Select and interpret the results of screening measures, laboratory tests, and diagnostic procedures appropriate to assess and manage a patient's nutrition. 1.4, 1.5

Evaluation

22) Evaluate a patient's diet and current nutritional status based on the USDA MyPlate. 1.6, 2.3

23) Identify individuals who require medical nutritional therapy and lifestyle modification. 1.5, 2.3, 2.4, 2.5

24) Integrate nutritional assessment information into an individualized nutritional management and physical activity plan for optimal health, risk factor reduction and common medical problems. 1.6

Counseling

25) Effectively counsel patients to make informed nutritional decisions consistent with adopting and maintaining a healthy lifestyle and with establishing appropriate dietary, exercise and behavioral goals. 3.8, 4.1, 4.6

26) Effectively communicate with patients in a culturally competent manner to provide accurate nutritional information and dispel misinformation. 3.8, 4.1, 4.6

27) Employ effective counseling techniques matched to the patient's level of motivation and readiness for change, encouraging the use of goal setting, identification of barriers, problem solving, self-monitoring, self-reinforcement, and stimulus control. 3.8, 4.1, 4.6, 4.7

Consultation and Referral

28) Consult with or refer to a registered dietitian or other credentialed healthcare professionals and refer to community nutrition resources as appropriate. 4.2, 4.3

Attitudes:

- 29) Recognize that nutrition, physical activity, and health lifestyle behaviors can have direct, substantial, and long-term effects on growth and development, health maintenance, and disease prevention and treatment. [2.2](#), [3.6](#), [3.10](#), [8.1](#)
- 30) Demonstrate a commitment to interact with patients in a culturally competent manner that appropriately acknowledges the unique characteristics and nutritional needs of each individual. [3.8](#),
- 31) Recognize how personal, environmental, and social factors interact and impact on eating behaviors and overall nutrition. [2.2](#)
- 32) Demonstrate sensitivity to biomedical and nutritional changes as well as psychological, social, and ethical issues that affect patient care. [4.7](#)
- 33) Recognize the importance of using a multi-disciplinary team approach in nutritional health care. [4.2](#), [4.3](#), [4.4](#), [6.1](#), [6.2](#), [7.1](#), [7.2](#), [7.4](#)
- 34) Recognize the importance of patient autonomy and shared decision making in the nutritional management of patients. [1.7](#), [4.1](#), [5.1](#), [5.2](#), [5.3](#)
- 35) Recognize the positive role of the physician as role model for patients regarding nutrition and health lifestyles. [1.10](#), [4.1](#), [4.7](#)
- 36) Recognize the importance of attention to nutritional management to enhance a patient’s quality of life. [1.2](#), [1.6](#), [1.7](#), [2.5](#), [4.1](#), [4.7](#), [5.4](#)
- 37) Recognize the physician’s responsibility to support public health initiatives that promote community health regarding nutrition and physical activity. [3.4](#), [3.6](#), [7.2](#)

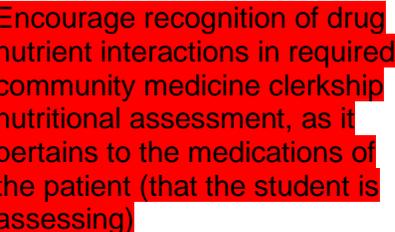
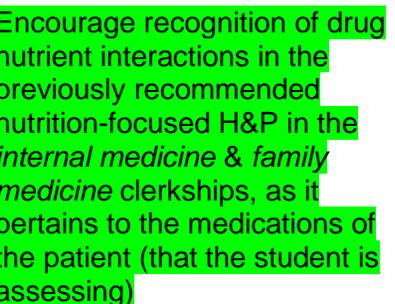
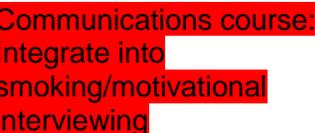
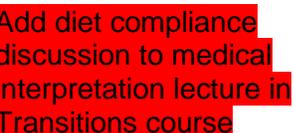
Course-linked Objectives and Recommendations

Course-Linked Objectives	Current Course and Content	Short Term	Long Term
		 Essential Desired	 Essential Desired
Explain nutritional guidelines and recommendations for healthy Americans. Recognize the science underlying guidelines and their limitations.	Case-oriented learning (COL) nutrition sessions 1&2: class discussions and learning issues Rural Practice of Medicine (MS-2) Anatomy biometrics lab	Introduction to Physical Exam: add anthropometrics session	Develop an end-of-year COL evidence-based OSCE that includes nutritional guidelines and dietary recommendations. Include one nutrition-related patient encounter for the M3 OSCE competency.
Explain steps in conversion of macronutrients to usable forms of energy	Cell and Molecular Medicine Medical Physiology	Clearly identify for students existing foundational nutrition	

Course-Linked Objectives	Current Course and Content	 Short Term Essential Desired	 Long Term Essential Desired
(ATP), including digestion, absorption, and metabolism.		science content in current basic science courses. Label as nutrition-related content.	
Recognize that nutrition, physical activity, and healthy lifestyles have direct, substantial, and long-term effects on growth and development, health maintenance, disease prevention, and treatment.	<p>COL – Nutrition Session 2 class discussions</p> <p>Pediatrics clerkship: taught & reinforced in each well child exam</p> <p>Family Medicine module that discusses overweight patient case</p> <p>Phil Steffy does wellness talks with students to recognize this for themselves</p>	<p>COL – Nutrition Session 2 – written reflection</p> <p>COL – Cadaver Case – where appropriate, encourage students to address diet/nutrition contribution to their case (obesity, coronary artery disease, degenerative joint disease, etc.)</p>	TPN case in surgery clerkship
Encourage students to conduct appropriate nutritional assessments on most ambulatory and hospitalized patients, when applicable, including those with acute or chronic disease as well as healthy individuals of all ages.	<p>Community Medicine required nutritional assessment</p> <p>Pediatrics clerkship has a lecture on fluid requirements and TPN calculations in pediatric patients</p>	<p>Recommend 1 of 12 required H&Ps in internal medicine clerkship to include a full nutritional assessment, physical exam, and nutrition recommendations as it relates to the patient's disease process</p> <p>Recommend 1 of 3 required H&Ps in family medicine clerkship to include a full nutritional assessment, physical exam, and nutrition recommendations for an</p>	<p>Recommend H&P with full nutritional assessment with resident or faculty feedback for the following clerkships: surgery, pediatrics, OB-gyn, medicine</p> <p>Expand nutrition assessments across clerkships—assess as a global objective/requirement for third year. [Apply a nutrition assessment rubric and some examples.]</p>

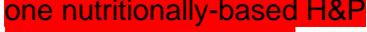
Course-Linked Objectives	Current Course and Content	<div style="background-color: red; color: black; padding: 2px;">Essential</div> <div style="background-color: green; color: black; padding: 2px;">Desired</div>	<div style="background-color: red; color: black; padding: 2px;">Essential</div> <div style="background-color: green; color: black; padding: 2px;">Desired</div>
		outpatient preventative health visit	
<p>Conduct an appropriately focused history and physical examination in a patient of any age, including anthropometrics. Select appropriate laboratory tests and procedures to diagnose and treat nutritional conditions such as over- and under-nutrition in hospitalized and ambulatory patients. Identify appropriate medical nutrition therapies.</p>	<p>Anthropometrics are introduced in COL, Anatomy Lab Session and Intro to Physical Exam Skills</p> <p>Practice of Medicine: IGR nutritional needs for at least one patient case per year.</p>	<div style="background-color: green; color: black; padding: 2px;">Practice of Medicine – dietary history with each patient scenario</div> <div style="background-color: green; color: black; padding: 2px;">All CIF Cases, COL cases, etc. include anthropometrics and dietary history with patient scenario</div> <div style="background-color: red; color: black; padding: 2px;">Ensure an appropriate physical exam and nutritional recommendations are included in the currently required community medicine clerkship nutritional assessment</div> <div style="background-color: red; color: black; padding: 2px;">Recommend 1 of 12 required H&Ps in internal medicine clerkship to include a full nutritional assessment, physical exam, and nutrition recommendations as it relates to the patient’s disease process*</div> <div style="background-color: red; color: black; padding: 2px;">Recommend 1 of 3 required H&Ps in family medicine clerkship to include a full nutritional assessment,</div>	<p>Investigate the ability to add an OSCE at the end of community medicine (financial resources available?) (Nutrition focused Simulated patient encounter?)</p> <p>Recommend required H&P with full nutritional assessment, physical exam, and nutrition recommendations for one outpatient or inpatient (with resident or faculty feedback) for the following clerkships: surgery, pediatrics</p> <p>Expand nutrition assessments across clerkships—assess as a global objective/requirement for third year. [Apply a nutrition assessment rubric and some examples.]</p>

Course-Linked Objectives	Current Course and Content	<div style="background-color: red; color: black; padding: 2px;">Essential</div> <div style="background-color: green; color: black; padding: 2px;">Desired</div>	<div style="background-color: red; color: black; padding: 2px;">Essential</div> <div style="background-color: green; color: black; padding: 2px;">Desired</div>
		<div style="background-color: red; color: black; padding: 2px;">physical exam, and nutrition recommendations for an outpatient preventative health visit*</div>	
<p>Apply nutrition recommendations specific to disease state when appropriate. Identify appropriate nutritional therapies.</p>	<p>Embryo (folate supplements/deficiency, glucose control in IDDM; PKU – low phenylalanine maternal diet); COL has a neural tube defect case</p> <p>Pathology discusses the nutritional components of some disease states (i.e. microcytic anemia, macrocytic anemia, Kwashiorkor)</p> <p>Biochemistry / Genetics (inborn errors of metabolism)</p> <p>Physiology discusses nutrition consequences of ileal resection and pernicious anemia</p> <p>COL (renal failure case; dialysis patient)</p> <p>Pediatrics clerkship has one lecture on fluid requirements and TPN requirement calculations in pediatric patients</p>	<div style="background-color: green; color: black; padding: 2px;">Include in Pathology and Practice of Medicine courses consistently and where appropriate.</div> <div style="background-color: red; color: black; padding: 2px;">Ensure appropriate nutrition recommendations are included in the already required community medicine clerkship nutritional assessment*</div> <div style="background-color: red; color: black; padding: 2px;">Recommend 1 of 12 required H&Ps in internal medicine clerkship to include a full nutritional assessment, physical exam, and nutrition recommendations as it relates to the patient's disease process*</div> <div style="background-color: red; color: black; padding: 2px;">Recommend 1 of 3 required H&Ps in family medicine clerkship to include a full nutritional assessment, physical exam, and nutrition recommendations for an</div>	<p>Recommend required H&P with full nutritional assessment, physical exam, and nutrition recommendations for one outpatient or inpatient (with resident or faculty feedback) for the following clerkships: surgery, pediatrics</p> <p>Expand nutrition assessments across clerkships—assess as a global objective/requirement for third year. [Apply a nutrition assessment rubric and some examples.]</p>

Course-Linked Objectives	Current Course and Content	 Short Term  Essential  Desired	 Long Term  Essential  Desired
		outpatient preventative health visit*	
Recognize common drug nutrient interactions.	Pharmacology: dietary modifications with Coumadin, P450 interactions, cancer chemotherapy that may block nutrient absorption Embryo (antiepileptics and folate)	 Encourage recognition of drug nutrient interactions in required community medicine clerkship nutritional assessment, as it pertains to the medications of the patient (that the student is assessing)  Encourage recognition of drug nutrient interactions in the previously recommended nutrition-focused H&P in the <i>internal medicine & family medicine</i> clerkships, as it pertains to the medications of the patient (that the student is assessing)	Encourage recognition of drug nutrient interactions in the previously recommended nutrition-focused H&P in the <i>surgery & pediatrics</i> clerkships, as it pertains to the medications of the patient (that the student is assessing)
Demonstrate skills to counsel patients to make informed nutritional decisions consistent with adopting and maintaining a healthy lifestyle and with establishing appropriate dietary, exercise and behavioral goals.	Intro to Clinical Psych – obesity, weight loss, motivational interviewing and lifestyle behavior modification Demonstrated in well child exams in general pediatrics clinic—no current formal assessment Transitions course/MS-3 OSCE competency	 Communications course: Integrate into  smoking/motivational interviewing  Add diet compliance discussion to medical interpretation lecture in Transitions course	Investigate the possibility of adding an OSCE at the end of community medicine clerkship

Course-Linked Objectives	Current Course and Content	Short Term Essential Desired	Long Term Essential Desired
Employ effective culturally sensitive counseling techniques matched to the patient's level of motivation and readiness for change, with appreciation for various behavioral change theories.	COL nutrition session 2 and Profession of Med – physician bias sessions Intro to Clinical Psych – motivational interviewing; model taught regarding readiness for change Transitions course: Medical interpreter session (not nutrition but it is asking for behavioral changes using an interpreter and considering the unique cultural boundaries)	Communications course: Integrate into smoking/motivational interviewing *	Investigate the possibility of adding an OSCE at the end of community medicine clerkship
Recognize how personal, environmental, and social factors interact and impact on eating behaviors and overall nutrition.	COL – Nutrition session 2 Class discussions	Integrate into Community Medicine Clerkship with additional learning modules	Community Medicine needs assessment project
Demonstrate sensitivity to biomedical and nutritional changes as well as psychological, life stage related, cultural, religious, social, and ethical issues that affect patient care.	Profession of Medicine -? Lifespan Development -? Intro to Clinical Psych	Integrate into Pediatrics clerkship and Family medicine-geriatrics / ELC rotation.	
Recognize the importance of using a multi-disciplinary team approach in nutritional health care.	COL – nutrition session 2 Profession of Medicine	Establish nutrition-focused Inter-professional Education Project as a graduation requirement. ICU/surgery/IM rotation requirement to work with nutritionist/pharmacist.	4 th yr IP elective Interest Group Community medicine/needs assessment
Demonstrate thorough understanding and		Community outreach	4 th year or multi year

Course-Linked Objectives	Current Course and Content	Short Term Essential Desired	Long Term Essential Desired
application of evidence-based information in addressing nutritional-related questions for health and disease; as well as answering questions related to contemporary trends in food, diets and nutrition. (GMOs?)		<p>experiential exercise as part of interest group or Community Medicine clerkship.</p> <p>Suggest incorporation of related topics into Biochemistry small group discussions</p>	<p>Journal club!! CIF Case Continuation of Comm Med Needs asmt? Identify problem, then determine best practice of addressing</p>
Understand the impact of serving as a positive role model for patients by maintaining a healthy personal lifestyle and by taking responsibility for your own health.	<p>Student Affairs health & wellness activities and resources</p> <p>Intramural sports</p> <p>Phil Steffy does wellness talks with students on doing this for themselves</p>	<p>Provide opportunities for student health, understanding diet trends, exercise recommendations, healthy lifestyles</p>	<p>Develop third COL nutrition session on activity (January/ New Year resolution)</p> <p>Journal (360 health watch App)</p>
Recognize role of food in environmental and socially conscious issues.	<p>COL – Nutritional session 2 Profession of Medicine -?</p>	<p>Required Inter-professional activity or community outreach experiential sessions (Farmers Market, community shopping trips, farm to market tours) *</p>	
Effectively communicate with patients to provide accurate nutritional information and dispel misinformation, including information about dietary supplements, nutraceuticals, functional foods, and fad diets for weight loss, disease prevention and treatment.	<p>Pharmacology—discussion of herbal products, alternative medicine</p> <p>Community medicine nutritional assessments</p>	<p>Recommend an attending or resident physician to observe each family medicine clerk communicate accurate nutritional information during an outpatient preventative health visit (this might fit best with the patient for whom each</p>	

Course-Linked Objectives	Current Course and Content	 Short Term  Essential  Desired	 Long Term  Essential  Desired
		 student is recommended to do  one nutritionally-based H&P  on the family medicine  clerkship)	

*repeated recommendation