Spring 2017
Nutrition in the Lifecycle
Tuesdays 9:00 AM- 12:00 PM
Sackler 604
January 24, 2017 to March 7, 2017

Instructor
Jeanne Goldberg
75 Kneeland St #850
Tel: 617.636.0895
Email: jeanne.goldberg@tufts.edu

Co-Instructor
Sarah Amin
75 Kneeland Street, #806
Tel.: 617.636.0928
Email: s.amin@tufts.edu

Course description: This course covers nutrition issues from preconception throughout adolescence, with a particular emphasis on nutrition correlates of normal growth and development and on the consequences of under and over nutrition. The course will consider the environmental and physiologic correlates of growth and development. It briefly considers the role of nutrition in the context of the normal physiologic changes that occur with aging.

Course objectives: The purpose of this course is to:

- Provide students with an understanding of the role of nutrition and food-related behaviors on health from pre-conception through adolescence.
- Demonstrate the application of science to the development and implementation of interventions to improve nutrition, food, and physical activity-related behaviors. Students will understand the extent to which major interventions have met the intended objective and where gaps remain.
- Provide students with an understanding of the major nutrition-related public health problems that affect individuals from conception throughout growth and development.

Grading:

Mid-term (Sessions 4-6): 30%
Students will begin an applied learning experience that will be completed independently beginning at week 4. Students will choose one of two topics: a) transitioning infants to solid foods OR b) choosing and serving snackfoods to pre-school aged children. Students may choose the format for presenting their project (e.g. pamphlet, PowerPoint, YouTube video). Students will also submit a one-page report (<500 words) on what issue they addressed and the rationale for what they presented. A more detailed set of instrutions will be provided.

Final: 40%
The final exam will include three case study problems to solve that will reflect knowledge of material contained in readings, as well as information presented in class.

Food for Thought Responses: 20%
Prior to each class, students will be required to submit a brief written response (<500 words) on Trunk to a question(s) based on the assigned reading for the week. Weekly submissions will be due the Sunday before class by midnight.

Class Participation: 10%
Students will be expected to participate in class as appropriate. To do that, students must complete the required reading before each class. There will be a special focus on articles identified "for discussion" at most session.

Required textbook:

1. Brown. Nutrition Through the Life Cycle, 6th Edition (2017).
   NOTE: This book is available in an on-line version for approximately half the price of the hard copy.

<u>Class 1: Tuesday January 24, 2017</u>
Jeanne Goldberg

Part I. Introduction

Part II. Preconception Nutrition

This session provides a framework to discuss the role of nutrition as it affects every stage of life from preconception through adolescence. It also focuses on the role of nutrition as it affects women of child-bearing age, and on the physiology of pregnancy.

Learning objectives:

- Students will understand the effects of nutrition at one life stage on health profiles at other life stages.
- Students will understand the effects of nutritional status prior to conception on both fertility and pregnancy outcome.
- Students will learn about programs to improve nutritional status in pre-pregnant women.
- Students will learn about the physiology of pregnancy.

Readings

1. Brown, Chapter 2
2. Ben-Shlomo Y, Cooper R, Kuh D. The last two decades of life course epidemiology, and its relevance for research on aging. *Int J Epidemiol*. 2016; 973-88.

Class 2: Tuesday January 31, 2017
Jeanne Goldberg & Sarah Amin

Nutrition During Pregnancy

This session focuses on the role of nutrition during the nine months of normal pregnancy, on the effects of suboptimal nutrition and poverty, and of underlying disease on pregnancy outcome.

Learning objectives:

- To understand how nutrition (nutrient requirements, dietary patterns, food safety) affects the physiology of pregnancy, fetal growth and development and pregnancy outcome in both the mother and the child in both singleton and multi-fetal pregnancies. It will focus on determinants of low birth weight, including under nutrition.
- To understand the science and cultural components of food beliefs and food aversions and about common complaints during pregnancy that have dietary implications
- To learn about underlying diseases such as hypertension, diabetes, HIV/AIDS and inborn errors of metabolism that affect pregnancy outcomes and to understand the special implications of food safety during pregnancy
- To understand common complications of pregnancy, such as pre-eclampsia and eclampsia and gestational diabetes
- To understand what is known about the role of physical activity during pregnancy and its effect on pregnancy outcome

Readings

1. Brown, Chapter 4; Chapter 5
2. Nascimento SL, Surita FG, Ceccati JG. Physical activity during pregnancy: a systematic review. *Curr Opin Obstet Gynecol*. 2012; 24: 387-94.
3. Evenson KR, Barakat R, Brown WJ, Dargent-Molina P, Haruna M, Mikkelsen EM, Mottola MF, Owe KM, Rousham EK, Yeo S. Guidelines for physical activity during pregnancy: comparisons from around the world. *Am J Lifestyle Med*. 2014; 8(2): 102-21.

Class 3: Tuesday February 7, 2017
Jeanne Goldberg & Sarah Amin

Nutrition During Lactation

This class focuses on feeding the infant from birth to six months. It provides an overview of the physiology of lactation, nutrient needs for lactation, the advantages/disadvantages to breast feeding, and a discussion of alternatives to breast feeding. Trends in breast feeding and programs to promote it will also be discussed.

Learning objectives:

- To understand the anatomy and physiology of human lactation
- To understand the advantages of breast feeding, incidence of breast feeding, technique for successful breast feeding, physical discomforts, maintenance of lactation during separation and illness, special breast-feeding circumstances; reasons for lactation failure
- To understand potential contraindications to breast feeding, including implications of contaminants in breast milk, maternal HIV/AIDS, drug use
- To learn about alternatives to breast feeding
- To learn about approaches to feeding low birth weight and premature infants
- To understand nutrient requirements for lactation and how these are met through various dietary alternatives
- To learn about the role of breast-feeding promotion programs and public health campaigns in the US and internationally.
- To understand the role of breastfeeding in the prevention of chronic disease

Readings

1. Brown: Chapter 6; Chapter 7
2. Anstey EH, MacGowan CA, Allen JA. Five-year Progress Update on the Surgeon General's Call to Action to Support Breastfeeding, 2011. *Journal of Women's Health.* 2016; 25(8).
3. Asiodu IV, Waters CM, Daily DE, Lee KA, Lyndon A. Breastfeeding and use of social media among first-time African American mothers. *JOGNN*. 2015; 44: 268-78.

Class 4: Tuesday February 14, 2017
Ed Saltzman & Jeanne Goldberg

Part 1. Food Allergies in Children

Part 2. Infant Nutrition: Introduction of Solid Foods

This class focuses on the introduction of solid food to the infant's diet and the transition to a more varied diet. Students will be asked to acquaint themselves with the foods available for infants and to come to class prepared to discuss their observations about the marketplace.

Learning objectives:

- To learn about the history of infant feeding as it has evolved in the US
- To understand the relationship between normal anatomic and physiologic development and the introduction of solid food
- To understand the relationship between growth and changes in nutrient needs
- To understand the factors associated with establishment of normal feeding patterns and the prevention and treatment of common feeding problems
- To understand how the transition from milk to a varied diet differs across cultures and the effects of those differences on growth.
- To understand the role of diet and nutrition in children with congenital anomalies and chronic illnesses, including allergies

Part 3. Nutrition in the Toddler/Preschool Child

This session will focus on food, nutrition and physical activity in the toddler/preschool child

Learning objectives:

- Students will understand normal growth and development; changes in energy and nutrient needs with growth in children from one to five years old
- Students will understand normal food behavior and the factors that affect food choices in toddlers/preschool children, including appetite and activity
- Students will learn about nutritional vulnerability in children in both the US and internationally and about approaches to the problem
- Students will learn about the role of food away from home in the diets of preschool children
- Students will understand the role of nutrient supplementation for preschool children

Readings

1. Brown: Chapter 8; Chapter 10
2. Grief, SN. Food allergies. *Prim Care Clin Office Practice*. 2016; 43: 375-91.

Class 5: Tuesday February 21, 2017
Sarah Amin

Part 1. Child and Preadolescent Nutrition

This session will focus on food and nutrition in the school age child. It will also cover some of the special issues that affect children.

Learning objectives:

- To understand normal growth and development; changes in energy and nutrient needs with growth in the school age child
- To understand normal food behavior and the factors that affect food choices in the school age child
- To learn about the role of school feeding programs and other foods consumed away from home in the diets of school age children
- To understand the role of nutrient supplementation for school age children

Readings

1. Brown: Chapter 12
2. Ralston K, Newman C. School Meals in Transition. 2015. Economic Research Service, United States Department of Agriculture.
3. Ritchie LD, Rosen NJ, Fenton K, Au LE, Goldstein LH, Shimada T. 2016. School breakfast policy is associated with dietary intake of fourth- and fifth-grade students. *J Acad Nutr Diet*. 2016; 16:449-57.

Part 2. Dietary Assessment Methods in Children

Students will learn about dietary methods that are used to collect dietary information in the range of nutrition surveys and studies.

Learning objectives:

- To understand the types of measures that are used to assess dietary intake and the individual, the household and the national level
- To understand the advantages and the limitations of the various methods, including the reliability and validity of each of them.

Readings

1. National Cancer Institute's Dietary Assessment Primer: https://dietassessmentprimer.cancer.gov/
2. Livingstone MBE, Robson PJ. Issues in dietary intake assessment of children and adolescents. *British Journal of Nutrition*. 2004; 92(2): S213-22
3. Burrows TL, Martin RJ, Collins CE. A systematic review of the validity of dietary assessment methods in children when compared with the method of doubly-labeled water. *J Am Diet Assoc*. 2010;110: 1501-10.

Class 6: Tuesday February 28, 2017
Jeanne Goldberg & Erin Hennessy

Part 1. Adolescent Nutrition

Learning objectives:

- Students will understand nutrient needs as they relate to normal growth and maturation among preadolescents and adolescents
- Students will understand the problem of overweight and obesity in the adolescent population and the recently increasing incidence of type 2 diabetes in this group
- Students will understand the common eating disorders that typically arise in adolescence, including anorexia nervosa and bulimia, their diagnosis and approaches to treatment.

Part 2. Parenting Styles and Feeding from Infancy through Childhood

Readings

1. Brown: Chapter 14 and 15
2. Birch LL, Doub AE. Learning to eat: birth to two years. *Am J Clin Nutr*. 2014; 99(suppl): 723S-8S.
3. Rollins BY, Savage JS, Fisher JO, Birch LL. Alternatives to restrictive feeding practices to promote self-regulation in childhood: a developmental perspective. *Pediatric Obesity.* 11, 326-32.

Additional

1. Patrick H, Hennessy E, McSpadden K, Oh A. Parenting styles and practices in children's obesogenic behaviors: scientific gaps and future research directions. *Childhood Obesity*. 2013; 9: S73-S86.

Class 7: Tuesday March 7, 2017

Final Exam