

NUTR 0374: ADVANCED CLINICAL NUTRITION PRACTICE IN KIDNEY DISEASE
Fall, 2022

Class Meetings: Wednesdays 4:00 pm – 7:00 pm

Location: 150 Harrison Ave, Jaharis Center, Room 105, Boston campus and Remotely via Zoom synchronously

Instructor(s): Haewook Han
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Phone 617-320-2804

Instructor Office Hours: by appointment only

Teaching Asst.: NA

Teaching Asst. Office Hours: NA

Semester Hour Units: 1.5 SHUs

Prerequisites: Nutrition Biochemistry (NUTR 0315) or equivalent, and Medical Nutrition Therapy (NUTR 0316) or equivalent. Graduate standing or instructor consent

Course Description:

The important purpose for proposing this course is to understand complications of kidney disease and plan various nutritional managements for the different stages of chronic kidney disease (CKD) and various types of other kidney disease. The Medical Nutrition Therapy (MNT) course provides basic nutritional management of CKD and end stage of kidney disease (ESKD). However, CKD is very complicated and the most recent trend of medical and nutritional managements of CKD have been changing from renal replacement therapy for ESKD to prevention of progression of CKD. The National Kidney Foundation (NKF) encourages earlier intervention of CKD since 2019 to slow progression of CKD which is also cost effective compared to ESKD management. Tufts MS/DI program provide more ESKD rotations than other programs in the U.S.; however our MS/DI students should get more clinical courses to be in good standing as entry level dietitians.

This course will cover updated knowledge of etiology of CKD which include diabetes, the major causes of CKD, hypertension, other kidney injury, medications, pediatric nutrition management, effects of current diet on CKD and kidney stones which many registered dietitian nutritionists (RDN) do not have enough knowledge for appropriate nutrition managements.

Course Goals:

The goal of the course is to increase students' knowledge on a variety of kidney diseases which is very specialized and requires extensive experience. They will also learn about causes, medical and nutritional management and apply that knowledge to their clinical practice as an entry level dietitians. At the completion of the course, students should be able to:

- Describe diagnosis, symptoms, nutritional evaluation and interventions of various types of kidney disease

- Distinguish different nutritional goals and interventions for chronic kidney disease (CKD) and end stage kidney disease (ESKD) patients
- Plan individualized medical nutrition therapy (MNT) for different types of kidney disease using evidence-based practice guidelines
- Identify different types of medical coverage among kidney disease patients: insurance coverage upon inpatients, outpatients and ESKD

Texts or Materials:

There is no one textbook assigned for this course but the optional textbook will be available as an electronic version via Medical Education Library in Boston Campus.

Textbook title 1: Primers on Kidney Disease 8th Ed.

<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>

<http://login.ezproxy.library.tufts.edu/login?url=https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20190046791>

Text book title 2: Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Humana Press, Springer Nature Switzerland, 2020. ISBN-978-3-030-44857-8

https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1

Reference book: Nutritional and Medical Management of Kidney Stones

<http://login.ezproxy.library.tufts.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2196757&site=ehost-live>

Academic Conduct:

Each student is responsible for upholding the highest standards of academic integrity, as specified in the Friedman School's Policies and Procedures Handbook

[https://nutrition.tufts.edu/sites/default/files/documents-forms/PoliciesProceduresHandbook 20-21Jan11.pdf](https://nutrition.tufts.edu/sites/default/files/documents-forms/PoliciesProceduresHandbook%202021Jan11.pdf) and Tufts University policies (<http://students.tufts.edu/student-affairs/student-life-policies/academic-integrity-policy>). It is the responsibility of each student to understand and comply with these standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school.

Classroom Conduct:

All students should be present at the classroom and via Zoom. Students will be expected to read the assigned background materials prior to coming to class and complete homework provided by the instructor to participate in interactive case discussion.

Assessment and Grading:

All students should complete the homework due the day of the class with same topic. The cases will be discussed at the class and the participation of discussion will be included in grading.

Grading Range: Students often inquire about a course’s letter grade range. To avoid ambiguity, including information about how you will be grading students in your course is recommended. Please note a course’s letter grade range is not set by the Friedman School—the grading range is at the instructor’s discretion (and the default Grading settings in Canvas can be adjusted accordingly). Below is an example of suggested grading range text (adjust the numeric scores and measurement items for your course):

Grading for the course will be based on the below distribution:

Homework and cases (previous lecture topic)	20%
Class participation with case discussion:	10%
Paper presentation:	30%
Exam:	40%

A passing grade in the course is B- or better. Course grades will be based on the below (subject to revision during the course):

A	> 94%
A-	90 - <94%
B+	87 - <90%
B	84 - <87%
B-	80 - <84%

Instructions for Submission of Assignments and Exams:

Assignments for this course include readings, homework with cases, in class discussions of case studies, and exam. There is no online discussion. For the most up to date information regarding assigned readings, instructions, and due dates of lecture.

Readings: each lecture has assigned readings and all students are required for finish them before the class to understand the lectures and to participate in class discussion

Homework: homework assignment will be provided by the course instructor week before the lecture topic and due is 3 PM on the lecture day. There is no acceptance for late submission.

Cases will be included in homework assignments. The cases will be based on the previous lecture.

Class participation and discussion of case studies: there will be at least 1- 2 cases presented by the lecturers and students will participate in discussion and background information which is from the homework.

Paper Presentation: Students should decide the topic of their presentations by September 28th. The topics should be nutritional management of kidney disease which is not covered by the lectures and approved by the instructor. For an example, new plant-based keto diet on delaying cyst growth of polycystic disease. Students will present the last day of the class and each presentation has maximum 20 min.

Accommodation of Disabilities: Tufts University is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations please contact the Friedman School Assistant Dean of Student Affairs at 617-636-6719 to make arrangements for determination of appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

The classes will be held at the Boston Campus in person except 3 lectures (9/21, 9/29 and 10/26) due to speakers who are not in MA. However all students should be in the class with me.

Tufts Zoom: Friedman’s on-campus courses may be offered by Tufts Zoom on days when the Boston campus is closed due to weather or a temporary cancellation issue. Students should expect to be notified by email in the event that class is cancelled and will be provided with the Zoom link for students to use for any remote class sessions. Also, any relevant course slides or materials will be made available on Canvas. The Zoom will be recorded and posted on Canvas when completed. If an on-campus Examination/Presentation was scheduled on a day when the Boston campus is closed due to weather or a temporary cancellation issue, the exam/presentation will be rescheduled for an alternate on-campus class session date.

Diversity Statement: We believe that the diversity of student experiences and perspectives is essential to the deepening of knowledge in this course. We consider it part of our responsibility as instructors to address the learning needs of all students in this course. We will present materials that are respectful of diversity: race, color, ethnicity, gender, age, disability, religious beliefs, political preference, sexual orientation, gender identity, socioeconomic status, citizenship, language, or national origin among other personal characteristics.

Course Topics and Assignment Schedule at a Glance

DATE OF CLASS	COURSE TOPIC	LECTURER	CLASS DISCUSSION MODERATOR	ASSIGNMENTS DUE
September 7, 2022	<p><i>Instruction and overview: normal and pathophysiology of kidney.</i></p> <p><i>Medication and kidney disease Nutrition Assessment of kidney disease</i></p>	<p><i>Wendy McCullum</i></p> <p><i>Haewook Han</i></p>	<i>Haewook Han</i>	<i>Homework to prepare lecture and discussion</i>

September 14,	<p><i>Chronic Kidney Disease (CKD)</i></p> <p><i>Causes, diagnosis, progression</i></p> <p><i>Nutrition Management: KDOQI, Case discussion</i></p>	<p><i>Taimur Dad</i></p> <p><i>Haewook Han</i></p>	<i>Haewook Han</i>	<p><i>Submit homework to prepare lecture and case discussion</i></p>
September 21	<p><i>End Stage Kidney Disease (ESKD) Medical, dialysis options</i></p> <p><i>Nutritional management (Zoom) Hemodialysis Peritoneal dialysis Cases</i></p>	<p><i>Caroline Hsu</i></p> <p><i>Beth Morlang (HD)</i> <i>Judith Kirk (PD)</i></p>	<i>Haewook Han</i>	<p><i>Submit homework to prepare lecture and case discussion</i></p>
September 28	<p><i>Kidney Transplant Medical management, complications</i></p> <p><i>Nutritional management</i></p> <p><i>Acute and chronic management</i></p> <p><i>Cases</i></p>	<p><i>Krishna Agarwal</i></p> <p><i>Judith Kirk</i></p>	<i>Haewook Han</i>	<p><i>Submit homework to prepare lecture and case discussion</i></p> <p><i>DUE for student presentation topic</i></p> <p><i>(Approved by H. Han)</i></p>
October 5	<p><i>Acute Kidney Injury (AKI) Medical management</i></p> <p><i>Nutritional management</i></p> <p><i>Temporary dialysis/ nutrition support Cases</i></p>	<p><i>Seth Wright</i></p> <p><i>Grace Phelan</i></p>	<i>Haewook Han</i>	<p><i>Submit homework to prepare lecture and case discussion</i></p>
October 12	<p><i>Various diet (KETO, vegetarian) and Kidney disease (CKD, polycystic kidney disease)</i></p> <p><i>Student presentation I (3-4 students)</i></p>	<i>Haewook Han</i>	<i>Haewook Han</i>	<p><i>Submit homework to prepare lecture and case discussion</i></p> <p><i>Maximum 15 minutes for student</i></p>
October 19	<p><i>Kidney Stones (Nephrolithiasis) Medical management</i></p> <p><i>Nutritional management</i></p> <p><i>Cases</i></p>	<p><i>Samer Nasser</i></p> <p><i>Haewook Han</i></p>	<i>Haewook Han</i>	<p><i>Submit homework to prepare lecture and case discussion</i></p>

October 26	Nutritional management of Pediatric kidney disease Student presentation II (rest of students)	Christine Benedetti		Submit homework to prepare lecture and case discussion Maximum 15 minutes for student
November 2	Exam	Haewook Han		

Detailed Description of Course Topics, Assignment Schedule, and the Learning Goals for Each Class Session:

Date of the class: September 7

Course Topic: Overview: normal and pathophysiology of kidney, medication and kidney disease.

Nutrition Assessment

Learning Goal

Understand overall kidney functions and disease state

Understand nutritional assessment of the kidney disease

Normal and pathophysiology of kidney

- Describe normal function of kidney and estimate the glomerular filtration rate (EGFR) with using various formula
- Recognize various types of kidney diseases and causes

Medication in Kidney Disease and Nutrition Assessment

- Identify the most recent medications of hypertension, and diabetes and effects on kidney disease.
- Describe various nutritional assessment tools to use kidney disease: anthropometric measures including body mass index, dietary recall/ record to analyze dietary intake
- Recognize biochemical indices and identify abnormal values.
- Establish nutritional interventions after using various tools to assess nutritional status

Required Reading and Assignments

- "Nutrition in Kidney Disease" 3rd ed
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1
- Reddi, AS, Kidney function in health and disease, Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Humna Press, Springer Nature Switzerland, 2020. ISBN-978-3-030-44857-8 **Chapter 3**
- Flecha A, Voss J, Hao D, Drug-Nutrient interactions, Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Humna Press, Springer Nature Switzerland, 2020. ISBN-978-3-030-44857-8. **Chapter 9**
- Dummer, F, Ghaddar, S, Moore LW, Components of Nutrition Assessment, Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Humna Press, Springer Nature Switzerland, 2020. ISBN-978-3-030-44857-8, **Chapter 4-7**
- NKF Primer on Kidney Diseases, 8th edition. Chapter 1. Overview of kidney structure and function
<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>

https://tufts.primo.exlibrisgroup.com/permalink/01TUN_INST/16r1drq/alma991018774336603851

Assignment Due: September 7 at 3PM

Date of the Class: September 14

Course Topic: Chronic Kidney Disease

Learning Goal

Understand the different stage of kidney disease and nutrition assessment for medical nutrition therapy of kidney disease

Objectives

Causes, diagnosis and progression of CKD

- Describe different causes of CKD including diabetes, hypertension and other causes
- Identify different tools used to diagnose different stages of CKD and prevention

Nutrition Management of CKD

- Identify the nutritional risk of CKD
- Understand new KDOQI nutrition guidelines
- Discuss appropriate nutrition recommendation in various stages of CKD and existing other medical conditions.
- Establish different meal patterns for CKD patients based on individual need

Case discussion

Require Reading and Assignments

- NKF Primer on Kidney Diseases, 8th edition. Chapter 50: Development and Progression of CKD Chapter 51: Staging and management of CKD
<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>
https://tufts.primo.exlibrisgroup.com/permalink/01TUN_INST/16r1drq/alma991018774336603851
- Harvey KS, CKD stages 1-5 (non-dialysis), Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 14 CKD stage 1-5 (Nondialysis)
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1
- KDOQI Clinical Practice Guideline for Nutrition in CKD: 2020 Update Am J Kidney Dis 76: 3 (Supp) 2020 www.ajkd.org

Assignment and Case study Due: September 14 at 3PM

Date of the Class: September 21

Course Topic: End Stage Kidney Disease (ESKD)

Learning Goal

Understand the end stage of kidney disease. Learn about medical and nutritional treatment

Objectives

Medical and dialysis options

- Describe various types of renal replacement therapies
- State pros and cons of each dialysis option

- Explain how to monitor adequacy of dialysis

Nutritional management of ESKD

- Hemodialysis
Specify standard medical nutrition therapy (MNT) for ESKD
Describe the nutritional goals for conventional, nocturnal and short daily hemodialysis
Perform nutrition assessment using subjective global and other standard measure of nutrition parameter.
- Peritoneal dialysis
Explain how nutritional assessment is different from hemodialysis and standard measure of nutritional status.

Require Reading and Assignments

- NKF Primer on Kidney Diseases, 8th edition. Chapter 50: Development and Progression of CKD Chapter 51: Staging and management of CKD Chapter 56: Hemodialysis and hemofiltration, Chapter 57: Peritoneal dialysis
<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>
https://tufts.primo.exlibrisgroup.com/permalink/01TUN_INST/16r1drq/alma991018774336603851
- Blair D, Maintenance Hemodialysis, Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Humna Press, Springer Nature Switzerland, 2020. ISBN-978-3-030-44857-8 Chapter 15 Maintenance Hemodialysis
- Parel, C and Burrowes, J Peritoneal Dialysis, Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 16 Peritoneal Dialysis
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1
- KDOQI Clinical Practice Guideline for Nutrition in CKD: 2020 Update Am J Kidney Dis 76: 3 (Supp) 2020 www.ajkd.org

Assignment and Case study Due: September 21 at 3PM

Date of the Class: September 28

Course Topic: Kidney Transplant

Learning Goal

Learn acute and chronic medical and nutritional management for transplant patients.

Objectives

Medical Management and complication:

- Recognize different type of transplant: pre-emptive, living doner, cadaver doner
- Understand Pre-transplant work-up
- Identify different immune suppressive medications and side effects
- Outline complication: acute/ chronic rejection

Nutritional Management

- Explain pre-transplant nutritional education
- Describe dietary recommendation for acute and chronic post-transplant phase
- Name side effects of various medication and nutritional management
- State how to maintain transplanted kidney health long term.

Require Reading and Assignments

- *NKF Primer on Kidney Diseases, 8th edition, Chapter 60 Post transplantation monitoring and outcome. Chapter 61 Immunosuppression and transplantation.*
<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>
https://tufts.primo.exlibrisgroup.com/permalink/01TUN_INST/16r1drq/alma991018774336603851
- *Pieloch, D Kidney Transplant, Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 18 Kidney Transplantation*
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1
- *KDOQI Clinical Practice Guideline for Nutrition in CKD: 2020 Update Am J Kidney Dis 76: 3 (Supp) 2020* www.ajkd.org

Assignment and Case study Due: September 28 at 3PM

Date of the Class: October 5

Course Topic: Acute Kidney Injury

Learning Goal

Understand the cause and medical management of acute kidney injury.

Understand the nutritional support for acute kidney injury.

Objectives

Medical Management of AKI

- *Understand the metabolic changes in AKI*
- *Compare the types of renal replacement therapies in AKI vs. ESKD*
- *Recognize the consequences of AKI and medical management*

Nutritional Management of AKI

- *Evaluate nutritional assessment and nutrition requirement for patients with AKI in hospital*
- *Assess the necessity of nutrition support for AKI*
- *Provide appropriate nutrition recommendation at the discharge*

Require Reading and Assignments

- *NKF Primer on Kidney Diseases, 8th edition, Chapter 31 Acute Kidney Injury*
<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>
https://tufts.primo.exlibrisgroup.com/permalink/01TUN_INST/16r1drq/alma991018774336603851
- *Grguric, L, Acute Kidney Injury. Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 26*
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1
- *McCarthy, M Nutritional management in acute kidney injury. Byham-Cray, L, Stover J, and Wiesen K eds A Clinical Guide to Nutrition Care in Kidney Disease 2nd ed. Academy of Nutrition and Dietetics, 2013 ISBN 978-0-88091*

Assignment and Case study Due: October 5 at 3PM

Date of the Class: October 12

Course Topic: *Various diet (Ketogenic, vegetarian diet) and Kidney Disease (CKD and polycystic Kidney disease)*

Learning Goal

Learn various diet recommendations for kidney disease, safety and problems.

Objectives

Various Diets and Kidney Disease:

- *Describe Ketogenic diet, modified Ketogenic diet and vegetarian diet*
- *Explain how these diets affect various stages of CKD*
- *Identify the effect of various diets on polycystic kidney disease.*

Require Reading and Assignments

- *Kelly JT. Dietary patters. Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 31 Dietary Pattern*
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1

Assignment and Case study Due: **October 12 at 3PM**

Student Presentation I (3-4 students)

Learning Goals

Student will provide the topic on nutrition and other kidney related disease which are not covered at the class. Each student can provide maximum 15 min presentation

Date of the Class: **October 19**

Course Topic: *Kidney Stones*

Learning Goals

Understand causes of kidney stones and learn medical and nutritional treatment of kidney stones.

Objectives

Medical Management of Kidney Stones

- *Describe various types of kidney stones*
- *Identify different risk factors for various risk factors*
- *Understand stone removal procedures and medical treatment*
- *Assess the urine and blood tests for recurrent stone risk evaluation*

Nutritional Management of Kidney Stones

- *Recognize dietary risk factors and effects on various type of stones.*
- *Specify nutritional intervention to lower risk of recurrence in various types stones*

Require Reading and Assignments

- *Han, H Nephrolithiasis. Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 25 Nephrolithiasis*
https://login.ezproxy.library.tufts.edu/login?auth=test&url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1
- *Han H, Segal A, Seifter J et cal. Nutritional management of kidney stones. Clin Nutr Res. 2015;4; 1370152*
- *Han, H Mutter, W and Nasser S eds. Nutritional and Medical Management of Kidney Stones. Humana Press, 2019 (e-book from Tufts Library)*

<http://login.ezproxy.library.tufts.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2196757&site=ehost-live>

Assignment and Case study Due: October 19 at 3PM

Date of the Class: October 26

Course Topic: Nutritional Management of Pediatric Kidney Disease

Learning Goals

Understand specific nutritional treatment for pediatric kidney disease

Objectives

- *Understand different causes of pediatric kidney disease*
- *Describe impact of nutrition on overall growth of pediatric kidney patients*
- *Identify differences of medical and nutritional treatment of pediatric patients than adult patients.*

Require Reading and Assignments

- *NKF Primer on Kidney Diseases, 8th edition, Chapter 46 Kidney disease in infants and children*
<https://www-clinicalkey-com.ezproxy.library.tufts.edu/#!/browse/book/3-s2.0-C20190046791>
https://tufts.primo.exlibrisgroup.com/permalink/01TUN_INST/16r1drq/alma991018774336603851
- *Nelms C, Warady B. Infancy, childhood and adolescence. Burrowes JD, Kovesdy CP and Byham-Gray LD eds. Nutrition in Kidney Disease 3rd ed. Chapter 20, Infant, Childhood and Adolescence*
https://login.ezproxy.library.tufts.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=2532940&site=ehost-live&ebv=EB&ppid=pp_C1

Assignment and Case study Due: October 26 at 3PM

Student Presentation

Learning Goals

Student will provide the topic on nutrition and other kidney related disease which are not covered at the class. Each student can provide maximum 15 min presentation

Date of the Class: November 2

Course Topic: Exam