Module 1: Study Guide
Introduction to Culinary Medicine and Mediterranean Diet

Class Preparation
Before class, students will be expected to review the online lecture, study guide, and referenced literature.

General Kitchen Safety
For safety, follow these guidelines when in the kitchen: 1. Wear closed-toed shoes to protect your feet from falling knives or burns. 2. Avoid wearing loose-fitting clothing or scarves, and pull long hair back because of exposure to open flame. 3. Remove all jewelry, especially dangling earrings.

Prevalence of Obesity Related Diseases in the United States
8.3 % of Americans have diabetes, and 1 in 3 adults suffer from hypertension. There are over 600,000 heart disease related mortalities in the United States each year, and 140,000 stroke deaths. Heart disease is costing the United States $108.9 billion dollars each year, and diabetes is costing $240 billion. Obesity itself is also highly prevalent in the U.S, with 35.7% of adults being obese. (1)

Mediterranean Diet Studies
Ancel Keys was one of the researchers who helped discover the Mediterranean diet. He questioned the relation between diets of different areas of the world and cardiovascular health. Keys also followed the Mediterranean Diet that he helped develop and lived to be 100 years old.

The Lyon Heart Study took a group of 605 patients who had just suffered their first heart attack. They were divided into two groups: the study group was given instruction to follow the Mediterranean diet, and the control group was told to follow a "prudent" diet. After following said diets, the group who followed the Mediterranean Diet showed a 50-70% reduction in a second heart attack. (2)

In a study on the adherence to the Mediterranean diet and survival in a Greek population, done by Antonia Trichiopoulou, 22,000 people were studied. They showed a significant reduction in coronary disease and cancer incidence after adhering to the Mediterranean diet. (3)

Mediterranean Diet Basics
There are 9 dietary components to the Mediterranean diet, and a score of 0-9 is given based upon the amounts of these foods consumed daily. A 2-point Mediterranean diet score improvement is correlated with a 25% reduction in death from all causes, including heart disease and cancer.

The 9 dietary components of the Mediterranean diet are: vegetables, legumes, fruits and nuts, cereals and whole grains, fish, oils/fats, dairy, meats, and alcohol.

Each additional serving of fruit and vegetables per day reduces your risk of CHD by 4%. Males should consume 10.8 ounces of vegetables per day, and females should consume 8.9 ounces.
Legumes, such as peas, lentils, peanuts, and bean pods, have very powerful positive effects. Males should consume around 2.1 ounces of legumes per day, and females should consume 1.75 ounces. Encouraging patients to have legumes as a side or main dish, and snacking on legumes such as peanuts is an easy way to add a point to the Mediterranean diet score.

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Fruits and nuts are grouped together in most Mediterranean diet research. It only takes a small amount of consumption to realize the benefits from these foods. Men should consume 8.9 ounces per day and females should consume 7.7 ounces. Nuts are a great snack alternative to discuss with your patients. Salted nuts are a much better choice than salty snacks like chips or crackers.

Cereals and whole grains should be consumed daily, but you should advise your patients to be skeptical about package labeling and ingredient lists. Packages should say “whole grain” and “whole wheat” and not just “wheat.” The ingredient lists should have whole grains listed before more processed ingredients like wheat flour. Some excellent choices of whole grains include corn, popcorn, brown or wild rice, baked corn tortillas, or quinoa. Men should consume 10.4 ounces per day, and women should consume 8.9 ounces to add one point to their Mediterranean diet score.

Fish is a very important part of the Mediterranean diet, but it also doesn’t take eating much of it to increase your Mediterranean diet score. Two servings of fish or more per week is sufficient. Men should consume 1 ounce per day, on average (about 2 four-ounce servings per week) and women should consume .75 ounces per day, on average (also about 2 four-ounce servings per week). Seafood is a great choice in general, but fatty fish such as salmon, trout, or tuna is considered an even better choice because of the high amount of omega-3 fats. Shrimp, clams, crabs, and scallops are also good seafood choices.

When it comes to oils and fats in the Mediterranean diet, the key is the ratio of unsaturated to saturated fats. A ratio of 1:1.6 (saturated to unsaturated) is ideal for the Mediterranean diet, and will add one point to your score. Advise patients to choose more monounsaturated fats such as olive, grapeseed, sesame, and other vegetable oils, and less animal fats, like butter.

Dairy is consumed in small amounts in the Mediterranean diet, and milk isn’t consumed as a beverage in Mediterranean countries. Most dairy consumed in the Mediterranean diet is fermented dairy, like cheese and yogurt. To earn a point on the Mediterranean diet score, men should eat no more than 7.2 ounces per day, and women should consume no more than 6.9 ounces. Consuming more than these limits will count as zero points toward one's Mediterranean diet score.

In the Mediterranean diet, meat is still consumed, but it is leaner than the meat consumed in a more typical American diet and includes all meats (such as chicken, pork, beef, or lamb). To add a point to the Mediterranean diet score, you should eat less than 4 ounces per day for men (on average), and 3.25 ounces for women. Advise patients to avoid highly processed meats, like bologna and hot dogs. Lean cuts of meat like pork tenderloin, trimmed chicken thighs and breasts, lean ground beef, and venison are healthier choices.

Alcohol is a part of the Mediterranean diet and is typically consumed at meals. The “dose” is a therapeutic window, with consuming some but not too much alcohol. Men can consume up to 2 drinks per day, and women can consume roughly 1 drink. It’s very important to remind patients that the average of two drinks per day does not mean saving those drinks through the week and drinking 14 drinks on a Saturday night. Binge drinking is obviously not advised.

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DASH Diet

The DASH (Dietary Approaches to Stop Hypertension) diet grew out of the Mediterranean diet literature. The original study that helped form the idea of DASH involved 459 adults with prehypertension or stage 1 hypertension. None of the participants was taking any antihypertensive drugs, and the participants were a 50/50 mix of males and females, with the majority being African American. Over the course of 8 weeks, participants were randomly assigned to one of three diet groups. The diets were prepared for the subjects and picked up at the study center. The control group was assigned to a diet that is similar to what Americans typically consume, and was somewhat lower in potassium, magnesium, and calcium. The next group ate similarly to the control group, but consumed much more fruits and vegetables. The third group consumed solely foods from the DASH diet. The DASH diet has many similarities with the Mediterranean diet, but with more adaptations for American taste. There is less emphasis on seafood and more focus on legumes. (4)

Food Group	Daily Servings	Serving Size	Choices	Notes
Grains, grain products	7–8	1 slice bread, 1 oz. dry cereal,† 1/2 cup cooked rice, pasta, or cereal	Whole wheat bread, English muffin, pita bread, bagel, cereals, grits, oatmeal, crackers, unsalted pretzels, popcorn	Major sources of energy and fiber
Vegetables	4–5	Serving sizes: 1 cup raw leafy vegetable, 1/2 cup cooked vegetable, 6 oz. vegetable juice	Tomatoes, potatoes, carrots, green peas, squash, broccoli, turnip greens, collards, kale, spinach, artichokes, green beans, lima beans, sweet potatoes r	Rich sources of potassium, magnesium, and fiber
Fruits	4-5	Serving sizes: 6 oz. fruit juice, 1 medium fruit, 1/4 cup dried fruit, 1/2 cup fresh, frozen, or canned fruit	Apricots, bananas, dates, grapes, oranges, orange juice, grapefruit, grapefruit juice, mangoes, melons, peaches, pineapples, prunes, raisins, strawberries,	Important sources of potassium, magnesium, and fiber
Low-fat or fat-free dairy	2–3	Serving sizes: 8 oz. milk, 1 cup yogurt, 1 1/2 oz. cheese	Fat-free (skim) or low-fat (1%) milk, fat-free or low-fat buttermilk, fat-free or low-fat regular or frozen yogurt, low-fat and fat-free cheese	Major sources of calcium and protein
Meats, poultry, and fish	2or less	Serving sizes: 3 oz. cooked meats, poultry, or fish	Select only lean meats; trim away visible fat; broil, roast, or boil, instead of frying; remove skin from poultry	Rich sources of protein and magnesium
Nuts, seeds, and dry beans	4–5 per week	Serving sizes: 1/3 cup or 1 1/2 oz. nuts, 2 Tbsp. or 1/2 oz. seeds, 1/2 cup cooked dry beans	Almonds, filberts, mixed nuts, peanuts, walnuts, sunflower seeds, kidney beans, lentils, peas	Rich sources of energy, magnesium, potassium, protein, and fiber
Fats and oils‡	2–3	Serving sizes: 1 tsp. soft margarine, 1 Tbsp. low-fat mayonnaise, 2 Tbsp. light salad dressing, 1 tsp. vegetable oil	Soft margarine, low-fat mayonnaise, light salad dressing, vegetable oil (eg, olive, corn, canola, safflower)	DASH has 27% of calories as fat, including that in or added to foods
Sweets	5 per week	Serving sizes: 1 Tbsp. sugar, 1 Tbsp. jelly or jam, 1/2 oz. jelly beans, 8 oz. lemonade	Maple syrup, sugar, jelly, jam, fruit-flavored gelatin, jelly beans, hard candy, fruit punch, sorbet, ices	Sweets should be low in fat

Example of DASH diet plan.

After following these strict diet plans, the group who followed the DASH diet had a significant reduction in blood pressure. The group on the fruit and vegetable diet also had a reduction in their blood pressure, but not as significant as the DASH diet group. Most significantly, there was a marked reduction in blood pressures for those with Stage 1 hypertension who were following the DASH Diet. For many patients this would be significant enough to control blood pressure without medication.

Mindfulness

Mindfulness is the intentional, accepting, and non-judgmental focus of one's attention on the emotions, thoughts, and sensations occurring in the present moment. In other words, mindfulness is the practice of focusing one's attention on the present. Mindfulness is gaining popularity in the field of mental health and eating disorders due to its emphasis on setting intention, acceptance, and non-judgment. These ideals are common difficulties individuals struggle with, so the use and practice of mindfulness has been shown to improve treatment outcomes.

The origins of mindfulness began in Buddhist culture and have been prevalent in Eastern medicine for centuries. It is believed that the emphasis on focus and awareness leads to insight regarding the Buddhist's 3 marks of existence: impermanence, suffering, and the non-self. It is tradition that a full understanding of these 3 marks can bring an end to suffering.

Mindfulness in the Modern Era

Dr. Jon Kabat-Zinn was the first to apply the Buddhist traditions of mindfulness to the practice of modern medicine. His creation of the Mindfulness-Based Stress Reduction (MBSR) program at the University of Massachusetts in 1979 focused on using these ancient practices to treat chronic stress. His work emphasized that the practice of mindfulness and intentional self-awareness, although grounded in religious principles, is part of the innate human experience and can be utilized in the secular culture. These teachings paved the way for the expansion of mindfulness and meditation to clinical medicine and, eventually, to the broader popular culture.

Key Tenets of Mindfulness

A number of key tenets underlie the concept of mindfulness. An emphasis is placed on remaining in the present moment and fully experiencing all that it offers. Practitioners are encouraged to continually examine the present experience, including both their internal thoughts and external sensations. As a thought or feeling comes into awareness, one acknowledges its presence non-judgmentally while allowing the consciousness to drift back toward the present. In this way, one begins to appreciate the transient nature of most sensations and learns to avoid becoming consumed by the thoughts and feelings that pass by.

Practicing mindfulness can take many forms. Some may choose to perform traditional, dedicated meditation sessions in which they assume a posture of introspection. The underlying principles of self-awareness, however, can also be incorporated into daily living activities. Mindfulness can therefore be utilized as a way of living and interacting with the world.

Clinical Implications

The concept of mindfulness has been gaining popularity in its inclusion in mental health treatment. As noted previously, the MBSR program started by Dr. Kabat-Zinn was the first of its kind. It emphasized skills such as body awareness, breathing relaxation, and hatha yoga postures to help individuals suffering from chronic pain and stress disorders. (5)

In 1995, Teasdale, Segal, and Williams expanded these principles to the treatment of major depressive disorder, which would be called mindfulness based cognitive therapy (MBCT). They theorized that teaching individuals how to detach themselves from their negative emotions and sensations would prevent the ruminative thinking patterns that often lead to relapse of depressive episodes. (6)

Whereas cognitive behavioral therapy (CBT) places more emphasis on teaching individuals to control their thoughts and emotions, acceptance and commitment therapy (ACT) encourages individuals to become aware, accept, and embrace their thoughts and emotions without judgement. (7)

Dialectical behavior therapy (DBT) is a model originally developed by Marsha Linehan to treat borderline personality disorder that now has more widespread utility in addiction and eating disorder treatment. (3) DBT combines cognitive models with concepts of mindfulness, acceptance, and distress tolerance skills. (3) This model helps individuals by increasing their emotional and cognitive regulation by identifying triggers and then their appropriate coping skill.

Each model focuses on educating the patient to become their own best advocate by gaining insight into their cognitive, emotional, and behavioral patterns and then helping them identify and reinforce their most effective ways of coping.

Evidence Based Applications

The advent of mindfulness in clinical practice has sparked numerous studies examining the utility of mindfulness-based interventions in treating common disorders. This list highlights the wide range of pathologies, ranging from psychological to skin disorders, that have been shown to benefit from mindfulness practices: chronic pain, stress, mood disorders (anxiety and major depressive disorder), personality disorders (borderline PD), post-traumatic stress disorder, ADHD, psoriasis, speech pathologies, irritable bowel syndrome, substance abuse, and eating disorders.

Mindfulness-based treatments have been gaining increased recognition in the treatment of eating disorders. In a meta-analysis of 21 studies, O'Reilley and colleagues looked at the effects of mindfulness-based interventions on obesity-related eating behaviors, including binge eating, emotional eating, and external eating (or eating in response to external food cues such as the appearance or taste of food). (8) They found that 18 of 21 studies examined reported mindfulness-based interventions to be effective in treating these disorders.

In a study in France, Camilleri looked at the correlation between weight status and mindfulness habits of 14,400 men and 49,228 women. (9) The study utilized the Five Facet Mindfulness Questionnaire, which scores individuals on five behaviors of mindfulness, including observing, describing, acting with awareness, non-judging of the inner experience, and non-reactivity to the inner experience. (6) Their

results found that individuals with a propensity toward mindfulness were less likely to be obese or overweight.

Utilizing a similar mindfulness scale, Loucks et al. examined the relationship between a disposition of mindfulness and blood glucose levels. Scores were determined by the Mindful Attention Awareness Scale, a 15 item measure assessing mindfulness of moment to moment experience. (10) Their results found that individuals with higher mindfulness scores were more likely to have normal blood glucose levels and less likely to be classified as pre-diabetic or diabetic. While not establishing causation, these findings highlight the link between mindful behaviors and better health outcomes.

Mindfulness in the Kitchen

Beyond clinical practice, the concept of mindfulness lends itself perfectly for use in the kitchen. Through awareness and focus on the 5 senses, one can gain a more connected cooking experience. Individuals that struggle with disordered eating typically report not only a disconnection to introceptive experiences like hunger and fullness, but also to the cooking and eating experience due to their heightened anxious response. Helping individuals achieve awareness of their meal's ingredients, portion sizes, and nutritional considerations is the goal.

The Five Domains of Mindful Eating

The five domains of mindful eating are disinhibition, awareness, external cues, emotional responses, and distraction. Disinhibition is the inability to stop eating even when full. (11) Instructing patients on using the Hunger Fullness Feelings Scale can help overcome disinhibition. Awareness is failure to notice or attend to sensations, perceptions, throughts, and feelings. External cues are those that trigger an eating response. An emotional response is eating in response to negative emotional states. Distraction is focusing on other activities while eating.

Five Domains of Mindful Eating Address: Disinhibition

Instructing patients on using the Hunger Fullness Feelings Scale can help overcome disinhibition. It is best to stay between 3 and 7 on the Hunger/ Fullness Scale You never want to be too hungry or too full. (12)

10	Uncomfortably full or "sick" – "Thanksgiving full"
9	Stuffed and uncomfortable
8	Too full, somewhat uncomfortable
7	Full, but not yet uncomfortable – hunger is gone
6	Filling up, but still comfortable – could definitely eat more
5	Neutral – neither hungry nor full
4	Slightly hungry, faint signals that your body needs food, but you can still wait to eat
3	Hungry, not yet uncomfortable, clear signals that your body needs food
2	Very hungry, irritable or anxious – you want to eat everything in sight
1	Starving, feeling weak, lightheaded, dizzy, or other extremely uncomfortable symptoms of hunger

There are prompts that you can use to determine the level of mindfulness in your patient. Questions such as "Asking if you really hungry?" and "Are you ready to stop eating?" can engender discussion. Consider other advice such as "stopping eating 2 or 3 times during a meal to ask yourself if you are still hungry or starting to feel satisfied" and "after you finish eating, check again to see how full you are."

Five Domains of Mindful Eating Address: Awareness
Awareness manifests as a failure to notice or attend to sensations, perceptions, thoughts, and feelings. Organoleptic awareness is being aware of the effects of food on the senses. Affective sensitivity is being aware of how food affects internal states. Consider suggesting activities that lead to awareness of food being consumed. For example, you might tell a patient to take small bites of food and chew it slowly to observe the texture, taste, and temperature of the food. You can follow this by having them take a deep breath and exhale after finishing every mouthful, and instruct them to express gratitude to be able to taste something delightful. (13)

Five Domains of Mindful Eating Address: External Cues
Brian Wansink and his team at Cornell have defined many external cues in well designed trials that can help lead to improved diet through awareness of external cues. The recognition of environmental triggers that promote eating is key. (14) These triggers include plate/glass size; eating from a bag, box, or container; eating in a group; "family style" eating; buffet meals; and advertising.

Five Domains of Mindful Eating Address: Emotional Responses
Eating in response to negative emotional states is common and discussing these triggers with patients can help you guide them to improved diet. Patients should be instructed to recognize the feeling behind the urge to eat in the absence of hunger. These feelings can be grouped into these four larger categories: sad (worthless, pessimistic, etc.), mad (bitter, irritable, etc.), glad (brash, lively, etc.), and scared (nervous, timid, etc.). Help patients separate emotional feelings from physical feelings and general stress.

Physical Feelings	General Stress
Tired	Burned-out
Thirsty	Sapped
Cold	Picked-on
Hot	Worn out

Five Domains of Mindful Eating Address: Distraction
Focusing on other activities while eating is a common issue today, and avoiding other pastimes while eating may help patients be more mindful. These distractions include watching television, working on the computer, playing games, talking on the phone, and reading.

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Mindfulness While Cooking
Mindfulness begins by incorporating the following concepts into planning and preparing meals: aroma, taste, texture, mouth feel, freshness/ripeness, and effort to eat. Focusing on the aroma, taste, and texture of recipes during the planning process can help manage mindful eating practices. Cook to explore the cultural and ecological aspects of eating. (15)

Mindfulness While Eating
A useful tool before beginning the meal may be to have a "mindful moment" or meditation. This may be used to set an intention for the meal, acknowledge without judgment any thoughts or emotions, and focus one's attention on the food. In order to focus attention on the meal, it is important to disengage from any distractions such as television, computers, or phones/tablets. Focusing on the meal allows the individual to experience hunger and fullness more completely and also has the secondary gain of fostering connection to peers when eating in groups. It is important to consider the pace of eating and portion sizes while maintaining a non-judgmental stance on the thoughts and emotions experienced.

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