Appendix E2.27: Evidence Portfolio

Part D. Chapter 2: Dietary Patterns, Foods and Nutrients, and Health Outcomes

What is the relationship between dietary patterns and measures of body weight or obesity?

Conclusion Statement: The DGAC concurs with the 2013 AHA/ACC/TOS *Guideline for the Management of Overweight and Obesity*[1] that strong evidence demonstrates that, preferably as part of a comprehensive lifestyle intervention carried out by multidisciplinary teams of professionals or nutrition professionals, overweight and obese adults can achieve weight loss through a variety of dietary patterns that achieve an energy deficit. Clinically meaningful weight losses that were achieved ranged from 4 to 12 kg at 6-month follow-up. Thereafter, slow weight regain is observed, with total weight loss at 1 year of 4 to 10 kg and at 2 years of 3 to 4 kg. However, some dietary patterns may be more beneficial in the long-term for cardiometabolic health.

DGAC Grade: Strong

The DGAC concurs with the NEL Dietary Patterns Systematic Review Project[2] that moderate evidence indicates dietary patterns that are higher in vegetables, fruits, and whole grains; include seafood and legumes; are moderate in dairy products (particularly low and non-fat dairy) and alcohol; lower in meats (including red and processed meats), and low in sugar-sweetened foods and beverages, and refined grains are associated with favorable outcomes related to healthy body weight (including lower BMI, waist circumference, or percent body fat) or risk of obesity. Components of the dietary patterns associated with these favorable outcomes include higher intakes of unsaturated fats and lower intakes of saturated fats, cholesterol, and sodium.

DGAC Grade: Moderate

Evidence for children is limited, but studies in the NEL Dietary Patterns Systematic Review Project and the systematic review focused on this age group by Ambrosini et al.[3] suggest that dietary patterns in childhood or adolescence that are higher in energy-dense and low-fiber foods, such as sweets, refined grains, and processed meats, as well as sugar-sweetened beverages, whole milk, fried potatoes, certain fats and oils, and fast foods increase the risk of obesity later on in life.

DGAC Grade: Limited

Review of Evidence

The DGAC considered evidence from the 2013 AHA/ACC/TOS *Guideline for the Management of Overweight and Obesity in Adults* and associated NHLBI Obesity Report,[1] which included

only randomized trials, the NEL Dietary Patterns Systematic Review Project,[2] which included 38 studies predominately of prospective cohort design and a few randomized trials, and two systematic reviews/meta-analyses published since 2008.[3, 4] In total, 81 articles were considered in these reports. The published reviews provided evidence for the pediatric population (included 7 studies of which 2 overlapped with those in the NEL review) and further evidence for dietary patterns related to the Mediterranean-style diet and its effect on obesity and weight loss (all randomized trials of which 1 out of the 16 studies overlapped with the NEL review).

Dietary Patterns and the Management of Overweight and Obesity

In the NHLBI Obesity Report, the 12 randomized studies described in summary Table 3.1 of the report all confirm that to lose weight, a variety of dietary pattern approaches can be used and a reduction in caloric intake is required. The energy balance equation requires that for weight loss, one must consume less energy than one expends or expend more energy than one consumes. The report states that any one of the following methods can be used to reduce food and calorie intake: prescription of 1,200 to 1,500 kcal/day for women and 1,500 to 1,800 kcal/day for men (kcal levels are usually adjusted for the individual's body weight); prescription of a 500 kcal/day or 750 kcal/day energy deficit; or prescription of an evidence-based diet that restricts certain food types (such as high-carbohydrate foods, low-fiber foods, or high-fat foods) in order to create an energy deficit by reduced food intake.

For the different dietary approaches (provided either as part of a comprehensive lifestyle change intervention carried out by a multi-disciplinary team of trained professionals or within nutrition interventions conducted by nutrition professionals) that the authors of the report evaluated, it is evident that all prescribed diets that achieved an energy deficit were associated with weight loss. There was no apparent superiority of one approach when behavioral components were balanced in the treatment arms. Results indicated that average weight loss is maximal at 6 months with smaller losses maintained for up to 2 years, while treatment and follow-up taper. Weight loss achieved by dietary techniques aimed at reducing daily energy intake ranges from 4 to 12 kg at 6-month follow-up. Thereafter, slow weight regain is observed, with total weight loss at 1 year of 4 to 10 kg and at 2 years of 3 to 4 kg. The following dietary approaches are associated with weight loss if reduction in dietary energy intake is achieved:

- A diet from the European Association for the Study of Diabetes Guidelines, which focuses on targeting food groups, rather than formal prescribed energy restriction while still achieving an energy deficit.
- Higher protein (25 percent of total calories from protein, 30 percent of total calories from fat, 45 percent of total calories from carbohydrate) with provision of foods that realized energy deficit.
- Higher protein Zone™-type diet (5 meals/day, each with 40 percent of total calories from carbohydrate, 30 percent of total calories from protein, 30 percent of total calories from fat) without formal prescribed energy restriction but realized energy deficit.

- Lacto-ovo-vegetarian-style diet with prescribed energy restriction.
- Low-calorie diet with prescribed energy restriction.
- Low-carbohydrate (initially less than 20 g/day carbohydrate) diet without formal prescribed energy restriction but realized energy deficit.
- Low-fat (10 percent to 25 percent of total calories from fat) vegan-style diet without formal prescribed energy restriction but realized energy deficit.
- Low-fat (20 percent of total calories from fat) diet without formal prescribed energy restriction but realized energy deficit.
- Low-glycemic load diet, either with formal prescribed energy restriction or without formal prescribed energy restriction but with realized energy deficit.
- Lower fat (≤30 percent fat), high dairy (4 servings/day) diets with or without increased fiber and/or low-glycemic index/load foods (low-glycemic load) with prescribed energy restriction.
- Macronutrient-targeted diets (15 percent or 25 percent of total calories from protein; 20 percent or 40 percent of total calories from fat; 35 percent, 45 percent, 55 percent, or 65 percent of total calories from carbohydrate) with prescribed energy restriction.
- Mediterranean-style diet with prescribed energy restriction.
- Moderate protein (12 percent of total calories from protein, 58 percent of total calories from carbohydrate, 30 percent of total calories from fat) with provision of foods that realized energy deficit.
- Provision of high-glycemic load or low-glycemic load meals with prescribed energy restriction.
- The AHA-style Step 1 diet (with prescribed energy restriction of 1,500 to 1,800 kcal/day, <30 percent of total calories from fat, <10 percent of total calories from saturated fat).

Although these dietary patterns with an energy deficit will result in weight loss during a 6-months to 2-year period, long-term health implications with certain patterns may be detrimental to cardiometabolic health. These associations have been discussed in the dietary patterns and cardiovascular health section as well as the saturated fat and cardiovascular health section.

Dietary Patterns and their Association with Body Weight

A total of 14 studies met the inclusion criteria for the index/score question of the NEL systematic review and were categorized based on dietary pattern exposure. Two major categories were identified: (1) studies that examined exposure based on a Mediterranean-designated dietary pattern and (2) studies that examined exposure based on expert dietary guidelines recommendations. Taken together, there were six studies on Mediterranean-designated diet scores,[5-10] five studies on dietary guidelines-based indices,[11-15] two studies on Mediterranean-designated scores and dietary guidelines indices,[16, 17] and one study that used a trial-based

customized score.[18] Two of the studies were RCTs of positive quality[5, 18] and 12 were prospective cohort studies. The studies were carried out between 2006 and 2012.

The sample sizes for prospective cohort studies ranged from 732 to 373,803 participants, with follow-up times from 1.5 to 20 years. Ten out of 12 of the prospective cohort studies were conducted with generally healthy adults with a mean age of 25 to 63 years. Two studies were conducted with children and adolescents (one with girls).[11, 12] The two RCTs were conducted in adults with elevated chronic disease risk: one study with a Mediterranean-designated diet intervention on older adults at increased CVD risk with more than 90 percent overweight or obese[5] and one study using an a priori diet intervention on men with pre-existing metabolic syndrome.[18] The sample sizes for the RCTs were from 187 to 769 subjects and duration of follow-up ranged from 3 to 12 months.

Mediterranean-style Dietary Pattern

Four out of the six studies evaluating the Mediterranean style dietary pattern were conducted in Spain.[5, 7-9] Of the other two, one study was the European multicenter study that was part of the EPIC-Physical Activity, Nutrition, Alcohol Consumption, Cessation of Smoking, Eating out of Home, and Obesity (EPIC-PANACEA) study,[10] and one was conducted in the United States.[6]

<u>Dietary Patterns and Body Weight and Incidence of Overweight and/or Obesity</u>

The Prevencion con Dieta Mediterranean (PREDIMED) study tested the effects of a Mediterranean diet on the primary prevention of cardiovascular disease in a high-risk group of men and women. Subjects either had type 2 diabetes or three cardiovascular disease risk factors (such as hypertension or current smoking) and 90 percent were overweight or obese defined as BMI ≥25 kg/m^2. The PREDIMED trial randomly assigned participants to three interventions: (1) Mediterranean diet with extra virgin olive oil, (2) Mediterranean diet with mixed nuts, and (3) low-fat diet. At end of 3 months of a 4-year clinical trial, the authors found that the Mediterranean diet score increased in the two Mediterranean diet groups of the trial and remained unchanged in the low-fat group. However, no significant changes in body weight and adiposity occurred within or between groups from baseline to the 3 months. Beunza et al., 2010 reported on a prospective cohort study in Spain, the Seguimiento Universidad de Navarra (SUN) study.[8] Participants with the highest adherence to a Mediterranean dietary pattern, assessed using the Trichopoulou Mediterranean Diet Score (MDS) were found to have lower average yearly weight gain, -0.059 kg/y (95% CI = -0.111 to -0.008 kg/y; p for trend = 0.02), than participants in the lowest adherence group.[19] However, the MDS was not associated with incidence of overweight or obesity in participants who were normal weight at baseline. Mendez et al., 2006 reported on the EPIC-Spain prospective cohort study.[9] Adherence to a Mediterranean diet was assessed using a slight modification of the Trichopoulou MDS, with exposure categorized in tertiles of low (0-3), medium (4-5), and high (6-8) adherence. Participants with highest MDS adherence had reduced incidence of obesity when overweight at baseline; overweight women and men were 27 percent and 29 percent, respectively, less likely to become obese. High MDS adherence was not associated with incidence of overweight in

subjects who were normal weight at baseline. The EPIC-PANACEA study examined the association between adherence to the relative Mediterranean dietary pattern (rMDS), prospective weight change, and the incidence of overweight or obesity. Participants with high rMED adherence gained less weight in 5 years than did participants with low rMED adherence (-0.16 kg; 95% CI = -0.24 to -0.07 kg) and had a 10 percent lower odds of becoming overweight or obese (OR = 0.90; 95% CI = 0.82 to 0.96). The contribution of each rMED scoring component also was assessed and it was found that the association between rMED and weight change was no longer significant when meat and meat products were not part of the score. Lastly, a meta-analysis of the odds ratio scores of all 10 European countries showed that a 2-point increase in rMED score was associated with 3 percent (95% CI = 1 to 5%) lower odds of becoming overweight or obese over 5 years.

Dietary Patterns and Waist Circumference

Rumawas et al., 2009 conducted a prospective cohort study using a subset of the Framingham Offspring and Spouse (FOS) study.[6] Dietary exposure was assessed in quintiles of low to high adherence to the Mediterranean style dietary pattern score (MSDPS). Participants with a higher MSDPS had significantly lower waist circumference (p for trend < 0.001). Tortosa et al., 2007 reported on the association of the Mediterranean dietary pattern and metabolic syndrome in the SUN study conducted in Spain.[7] Participants in the highest tertile of adherence to the MDS had lower waist circumference, -0.05 cm over 6 years (p for trend = 0.038), compared to the lowest tertile.

Although some mixed results from prospective studies may be due to differences in the length of follow up, definition of the Mediterranean dietary pattern and population included, the results of randomized studies indicate a significant reduction in body weight when calories are restricted. A high quality meta-analysis (AMSTAR rating of 11) on the association of a Mediterranean-style diet with body weight conducted by Esposito included 16 randomized studies of which one[7] overlapped with the NEL systematic review was included in the DGAC body of evidence for this question. The meta-analysis included studies conducted in the United States, Italy, Spain, France, Israel, Greece, Germany, and the Netherlands that lasted from 4 weeks to 24 months with a total of 3,436 participants. Using a random effects model, participants in the Mediterranean diet group had significant weight loss (mean difference between Mediterranean diet and control diet, -1.75 kg; 95% CI = -2.86 to -0.64) and reduction in BMI (mean difference, -0.57 kg/m^2; 95% CI = 0.93 to 0.21 kg/m^2) compared to those in the control arm. The effect of Mediterranean diet on body weight was greater in association with energy restriction (mean difference, -3.88 kg; 95% CI = -6.54 to -1.21 kg), increased physical activity (-4.01 kg; 95% CI = -5.79 to -2.23 kg), and follow up longer than 6 months (-2.69 kg; 95% CI = -3.99 to -1.38 kg). Across all 16 studies, the Mediterranean style dietary pattern did not cause weight gain.

Dietary Guidelines-Based Indices

Of the seven studies conducted on dietary guidelines-based indices, three studies were conducted in the United States with U.S.-based indices.[11, 13, 15] One study was conducted in

Germany with an index developed in the United States,[12] and two studies were conducted in France (one used a French index,[14] and the other compared six different dietary scores).[16]

Dietary Patterns and Body Weight and Incidence of Overweight and/or Obesity

Gao et al., 2008 reported on a prospective cohort study of White, African American, Hispanic, and Chinese men and women in the Multi-Ethnic Study of Atherosclerosis (MESA) in the US. Two versions of the 2005 HEI were used: the original and a modified version that adjusted the food group components to incorporate levels of caloric need based on sex, age, and activity level.[13] For the overall population, there was an inverse association between quintiles of each HEI score and BMI ($p<0.001$). The risk of obesity in normal weight participants was inversely associated with HEI scores only for Whites ($p<0.05$). A comparison of the HEI-1995 and HEI-2005 scores indicated that beta-coefficients, as predictors of body weight and BMI, were higher for the HEI-2005 scores in Whites. Zamora et al., 2010 analyzed data from the prospective cohort study, Coronary Artery Risk Development in Young Adults (CARDIA), conducted in the United States, to examine the association between diets consistent with the 2005 Dietary Guidelines and subsequent weight gain in Black and White young adults.[15] The Diet Quality Index (DQI) included 10 components of the 2005 Dietary Guidelines relating to the consumption of total fat, saturated fat, cholesterol, added sugars, reduced-fat milk, fruit, vegetables, whole grains, nutrient-dense foods, and limited sodium and alcohol intake. They found, a 10-point increase in DQI score was associated with a 10 percent lower risk of gaining 10 kg in normal-weight Whites. However, the same magnitude increase in score was associated with a 15 percent higher risk in obese Blacks ($p<0.001$). Kesse-Guyot et al., 2009 conducted a prospective cohort study in France to examine the association between adherence to a dietary score based on the French 2001 nutritional guidelines (Programme National Nutrition Sante´ guidelines score (PNNS-GS) and changes in body weight, body fat distribution, and obesity risk.[14] The PNNS-GS includes 12 nutritional components: fruit and vegetables, starchy foods, whole grains, dairy products, meat, seafood, added fat, vegetable fat, sweets, water and soda, alcohol, and salt. The last PNNS-GS component is physical activity. In fully adjusted models, an increase of one PNNS-GS unit was associated with lower weight gain ($P=0.004$), and lower BMI gain ($P=0.002$). An increase of 1 PNNS-GS unit was associated with a lower probability of becoming overweight (including obese) (OR = 0.93; 95% CI = 0.88 to 0.99). Similarly, an increase of 1 PNNS-GS unit was associated with a lower probability of becoming obese (OR = 0.89; 95% CI = 0.80 to 0.99).

Two studies were conducted in children. Cheng et al., 2010 analyzed data from a prospective cohort study conducted in Germany, the Dortmund Nutritional and Anthropometric Longitudinally Designed (DONALD) study, to examine whether the diet quality of healthy children before puberty was associated with body composition at onset of puberty.[12] Adherence to a diet pattern was assessed by the Revised Children's Diet Quality Index (RC-DQI) which was based on the Dietary Guidelines for Americans. In this study, a higher dietary quality was associated with a higher energy intake, and children with a lower diet quality had lower BMI and Fat Mass Index (FMI) Z-scores at baseline ($p<0.01$) but not at onset of puberty. Berz et al., 2011 reported on a prospective cohort study to assess the effects of the DASH eating pattern

on BMI in adolescent females over a 10-year period.[11] Only seven out of the 10 original components of the DASH score were used; the three excluded were added sugars, discretionary fats and oils, and alcohol. Overall, girls in the highest vs. lowest quintile of DASH score had an adjusted mean BMI of 24.4 vs. 26.3 kg/m2 ($p<0.05$).

Dietary Patterns and Waist Circumference

Gao et al, found, for the overall population in the MESA study, an inverse association between quintiles of each HEI score and waist circumference (WC) ($p<0.001$).[13] The study by Kesse-Guyot conducted in France showed, in fully adjusted models, an increase of one PNNS-GS unit was associated with lower waist circumference gain ($p=0.01$) and lower waist-to-hip ratio gain ($P=0.02$).[14]

Other Indices

Jacobs et al., 2009 conducted an RCT in Norway, the Oslo Diet and Exercise Study, to examine the effect of changes in diet patterns on body weight and other outcomes among men who met the criteria for the metabolic syndrome (n=187 men).[18] Study participants were randomly assigned to: (1) the diet protocol, (2) the exercise protocol, (3) the diet + exercise protocol, or (4) the control protocol. The trial duration was 12 months. The authors created their own diet score to assess adherence to the intervention. The score was based on summing the participants ranking of intake (across tertiles) of 35 food groups that, based on the literature, had a beneficial neutral or detrimental effect on health. A higher score reflected greater adherence to the diet intervention. Over the course of the intervention, the diet score increased by 2 points (SD ±5.5) in both diet groups, with a decrease of an equivalent amount in the exercise and control groups. A 10-point change in the diet score during the intervention period was associated with a 3.5 kg decrease in weight, a 2.8 cm decrease in waist circumference and 1.3 percent decrease in percent body fat (all significant at $p<0.0001$).

Studies that Compared Various Dietary Indices

In a study by Lassale et al., subjects were participants in the SUpplementation en VItamines et Minereaux AntioXydants (SU.VI.MAX) study and diet quality was assessed using a Mediterranean Score (MDS, rMED, MSDPS), the Diet Quality Index-International (DQI-I), the 2005 Dietary Guidelines for Americans Adherence Index (DGAI), and the French Programme National Nutrition Sante-Guidelines Score (PNNS-GS).[16] Overall, better adherence to a Mediterranean diet (except for the MSDPS) or expert dietary guidelines was associated with lower weight gain in men who were normal weight at baseline (p for trend = <0.05). In addition, among the 1,569 non-obese men at baseline, the odds of becoming obese associated with one standard deviation increase in dietary score ranged from OR = 0.63 (95% CI = 0.51 to 0.78) for the DGAI to OR = 0.72 (95% CI = 0.59 to 0.88) for the MDS, only the MSDPS was non-significant. In women, no association between diet scores and weight gain or incidence of obesity was found. Woo et al., 2008 reported on a prospective cohort study in Hong Kong to examine adherence to a diet pattern using the MDS and the Diet Quality Index International

(DQI-I).[17] They found that increased adherence to either the MDS or DQI-I was not associated with becoming overweight.

Dietary Patterns from Data-Driven Methods

In the NEL review, a total of 11 studies from prospective cohort studies were included that either used factor or cluster analyses to derive dietary patterns. Eight of the eleven studies were conducted in the United States, with additional studies from the United Kingdom, Iran, and Sweden. The sample sizes ranged from 206 to 51,670 participants with follow-up times from 3 to 20 years. The majority of the studies were conducted with generally healthy adult men and women,[20-25] five studies included women only,[26-30] and one was conducted in children to examine weight gain in adolescence over the period of follow-up.[29] Outcomes examined included change in body weight (3 studies), BMI (7 studies), and waist circumference (6 studies); one study examined both percent body fat and incidence of overweight/obesity.

Most of the studies found at least two generic food patterns: a "healthy/prudent" food pattern and an "unhealthy/western" pattern. Generally, healthy patterns were associated with more favorable body weight outcomes, while the opposite was seen for unhealthy patterns. However, not all studies reported significant associations. There was a potential difference in associations found by sex: of the three studies that analyzed men and women separately, men tended to have null results. However, data were insufficient to draw conclusions about population subgroups. Furthermore, because the patterns are data-driven, they represent what was consumed by the study population, and thus it is difficult to compare across the disparate patterns. The one study that analyzed the dietary patterns of pre-pubescent children transitioning into adolescence showed that patterns vary widely at this age and caution should be observed when analyzing these data because the diet of children changes rapidly, as does their weight.

The DGAC considered the systematic review by Ambrosini et al. that included seven articles, two of which overlapped with the NEL review.[3] Results demonstrated a positive association between a dietary pattern high in energy-dense, high fat, and low fiber foods and later obesity (4 of the 7 studies), while three studies demonstrated null associations. The seven longitudinal studies of children from the United Kingdom, United States, Australia, Norway, Finland, and Colombia had follow-up periods ranging from 2 to 21 years and had sample sizes from 427 to 6772 individuals. The studies determined dietary patterns using factor or cluster analysis (5) or reduced rank regression (2).

Table 1. Summary of existing reports, systematic reviews, and meta-analyses examining the relationship between dietary patterns and measures of body weight or obesity

Question/ Purpose AMSTAR Rating*	Dietary Patterns and Outcomes	Included Studies** (Number and Study Design)	Evidence/ Conclusion Statement from Existing Report/ SR/ MA

NEL Dietary Patterns Systematic Review Project, 2014			
Overarching Finding/ Recommendation: More favorable outcomes related to body weight or risk of obesity were observed when there was increased adherence to a diet that emphasized fruits, vegetables, and whole grains. Some studies also reported more favorable body weight status over time with regular intake of fish and legumes, moderate intake of dairy products (particularly low-fat dairy) and alcohol, and low intake of meat (including red and processed meat), sugar-sweetened foods and drinks, refined grains, saturated fat, cholesterol, and sodium.			
What is the relationship between adherence to dietary guidelines/ recommendations or specific dietary patterns, assessed using an index or score, and measures of body weight or obesity?	Dietary pattern assessed using index/score methodology Body weight, BMI, percent body fat, waist circumference, overweight, obesity	14 12 PCS (from 10 cohorts); 2 RCT	There is moderate evidence that, in adults, increased adherence to dietary patterns scoring high in fruits, vegetables, whole grains, legumes, unsaturated oils, and fish; low in total meat, saturated fat, cholesterol, sugar-sweetened foods and drinks and sodium; and moderate in dairy products and alcohol is associated with more favorable outcomes related to body weight or risk of obesity, with some reports of variation based on gender, race or body weight status. (Moderate)
Are prevailing patterns of dietary intake in a population, assessed using cluster or factor analyses, related to the risk of obesity?	Dietary pattern assessed using factor or cluster analysis Body weight, BMI, percent body fat, waist circumference, overweight, obesity	11 11 PCS	Limited and inconsistent evidence from epidemiological studies examining dietary patterns derived using factor or cluster analysis in adults found that consumption of a dietary pattern characterized by vegetables, fruits, whole grains and reduced-fat dairy products tends to be associated with more favorable body weight status over time than consumption of a dietary pattern characterized by red meat, processed meats, sugar-sweetened foods and drinks, and refined grains. (Limited)
What combinations of food intake, assessed using reduced rank regression, explain the most variation in risk of obesity?	Dietary pattern assessed using reduced rank regression Body weight, BMI, percent body fat, waist circumference, overweight, obesity	6 6 PCS	There are a number of methodological differences among the studies examining the relationship between dietary patterns derived using reduced rank regression and body weight status. The disparate nature of these studies made it difficult to compare results, and therefore, no conclusions were drawn. (Grade not Assignable)
What is the relationship between adherence to dietary guidelines/ recommendations or specific dietary patterns, assessed using methods other than index/score, cluster or factor, or reduced rank regression analyses, and body weight status?	Dietary pattern assessed using methodologies other than index, factor, cluster, or reduced rank regression analyses Body weight, BMI, percent body fat, waist circumference, overweight, obesity	7 4 RCT; 3 PCS	There is moderate evidence that adherence to a dietary pattern that emphasizes vegetables, fruits, and whole grains is associated with modest benefits in preventing weight gain or promoting weight loss in adults. (Moderate)

Managing overweight and obesity in adults: Systematic evidence review from the Obesity Expert Panel (National Heart, Lung, and Blood Institute, 2013) **AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults (Jensen, 2013)**			
Overarching Finding/ Recommendation: Prescribe a diet to achieve reduced calorie intake for obese or overweight individuals who would benefit from weight loss, as part of a comprehensive lifestyle intervention. Any one of the following methods can be used to reduce food and calorie intake: a. Prescribe 1,200–1,500 kcal/day for women and 1,500–1,800 kcal/day for men (kcal levels are usually adjusted for the individual's body weight); b. Prescribe a 500 kcal/day or 750 kcal/day energy deficit; or c. Prescribe one of the evidence-based diets that restricts certain food types (such as high-carbohydrate foods, low-fiber foods or high-fat foods) in order to create an energy deficit by reduced food intake. Prescribe a calorie restricted diet, for obese and overweight individuals who would benefit from weight loss, based on the patient's preferences and health status and preferably refer to a nutrition professional* for counseling. A variety of dietary approaches can produce weight loss in overweight and obese adults, as presented in CQ3, Evidence Statement 2 (Strong)			
In overweight or obese adults, what is the comparative efficacy/ effectiveness of diets of differing forms and structures (macronutrient content, CHO and fat quality, nutrient density, amount of energy deficit, dietary pattern) or other dietary weight loss strategies (e.g., meal timing, portion controlled meal replacements) in achieving or maintaining weight loss? During weight loss or weight maintenance after weight loss, what are the comparative health benefits or harms of the above diets and other dietary weight loss strategies?	• Low calorie • Very low-calorie diet (VLCD) • Low-fat • High-fiber • High-protein • High-carbohydrate • Low-carbohydrate • Scheduling (meals and meal pattern) • Carbohydrate counting • Meal replacement • Low glycemic index • Glycemic load • Dietary Approaches to Stop Hypertension (DASH) • Omni • Atkins • Vegetarian • Therapeutic Lifestyle Changes • Portfolio • Ketogenic • Mediterranean • South Beach® • Zone® • Ornish • Pritikin • Energy density • Portion control • Volumetrics Reduction in body weight as	18 18 articles from 12 RCT	ES 2. A variety of dietary approaches can produce weight loss in overweight and obese adults. All of the following dietary approaches (listed in alphabetical order below) are associated with weight loss if reduction in dietary energy intake is achieved: • A diet from the European Association for the Study of Diabetes Guidelines, which focuses on targeting food groups, rather than formal prescribed energy restriction while still achieving an energy deficit. • Higher protein (25% of total calories from protein, 30% of total calories from fat, 45% of total calories from carbohydrate) with provision of foods that realized energy deficit • Higher protein Zone®-type diet (5 meals/day, each with 40% of total calories from carbohydrate, 30% of total calories from protein, 30% of total calories from fat) without formal prescribed energy restriction but realized energy deficit • Lacto-ovo-vegetarian-style diet with prescribed energy restriction • Low-calorie diet with prescribed energy restriction • Low-carbohydrate (initially <20 g/day carbohydrate) diet without formal prescribed energy restriction but realized energy deficit • Low-fat (10% to 25% of total calories from fat) vegan style diet without formal prescribed energy restriction but realized energy deficit • Low-fat (20% of total calories from fat) diet without formal prescribed energy restriction but realized energy deficit • Low-glycemic load diet, either with formal prescribed energy restriction or without formal prescribed energy restriction but with realized energy deficit • Lower fat (≤30% fat), high dairy (4 servings/day) diets with or without increased fiber and/or low-glycemic index/load foods (low-glycemic load) with prescribed energy restriction • Macronutrient-targeted diets (15% or 25% of total calories from protein; 20% or 40% of total calories from fat; 35%, 45%, 55%, or 65% of total calories from carbohydrate) with prescribed energy restriction • Mediterranean-style diet with prescribed energy restriction • Moderate protein (12% of total calories from protein, 58% of total calories from carbohydrate, 30% of total calories from fat) with provision of foods that realized energy deficit • Provision of high-glycemic load or low-glycemic load meals

	measured by: • Weight (kg, lb., %) • BMI and BMI change • Waist circumference • Waist-hip ratio • % body fat • % reduction of excess weight • Weight loss maintenance		with prescribed energy restriction • The AHA-style Step 1 diet (with prescribed energy restriction of 1,500–1,800 kcal/day, <30% of total calories from fat, <10% of total calories from saturated fat) (High)
Ambrosini, 2013			
To systematically review the current evidence pertaining to overall dietary patterns and childhood and later obesity risk AMSTAR: 8/11	Principal components analysis, factor analysis, and reduced rank regression Obesity	7 7 PCS	Dietary patterns that are high in energy-dense, high-fat, and low-fiber foods predispose young people to later overweight and obesity.
Esposito, 2011			
To evaluate the effect of Mediterranean diets on body weight in randomized controlled trials Meta-analysis AMSTAR: 11/11	Mediterranean dietary pattern (control group varied: low-fat, high carb, prudent, usual diet, ADA diet, high-sat fat, general diet info, less counseling on Med diet) Change in body weight or BMI	16 16 RCT	Mediterranean diet may be a useful tool to reduce body weight, especially when the Mediterranean diet is energy-restricted, associated with physical activity, and more than 6 months in length. Mediterranean diet does not cause weight gain. In a random-effects meta-analysis, the Mediterranean diet group had a significant effect on weight [mean difference between Mediterranean diet and control diet, -1.75 kg; 95% CI: -2.86 to -0.64) and BMI (mean difference, -0.57 kg/m^2, -0.93 to 0.21 kg/m^2). The effect of Mediterranean diet on body weight was greater in association with energy restriction (mean difference, -3.88 kg, 95% CI: -6.54 to -1.21 kg), increased physical activity (-4.01 kg, 95% CI: -5.79 to -2.23 kg), and follow up longer than 6 months (-2.69 kg, 95% CI: -3.99 to -1.38 kg).

*A measurement tool for the 'assessment of multiple systematic reviews' (AMSTAR)

**Reference overlap: Of the 81 articles included in total across the reviews, 3 were included in two or more reviews.

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project. Am J Clin Nutr. 2010;92(4):912-21. PMID: 20810975. http://www.ncbi.nlm.nih.gov/pubmed/20810975.

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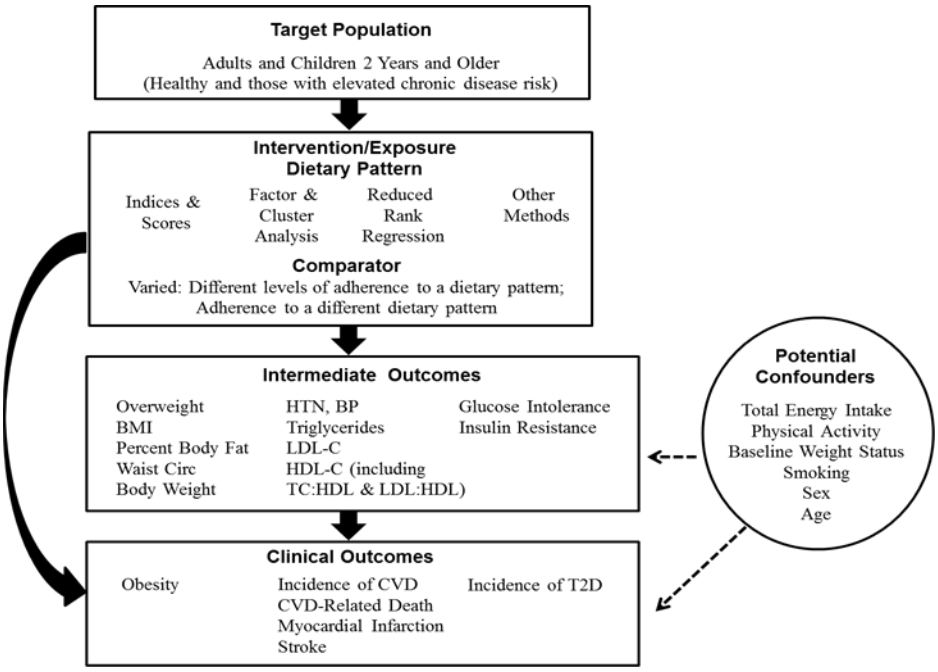
Associated Lifestyle Guideline:

Eckel RH, Jakicic JM, Ard JD, de Jesus JM, Houston Miller N, Hubbard VS, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2014;63(25 Pt B):2960-84. PMID: 24239922. http://www.ncbi.nlm.nih.gov/pubmed/24239922

Supplementary Information:

*(**Note:** The search and update for the dietary patterns and CVD, body weight, and type 2 diabetes reviews were done simultaneously and are described together below.)*

Analytical Framework



Methodology

The questions examining dietary patterns and risk of CVD, obesity, and type 2 diabetes were answered using existing reports, systematic reviews, and meta-analyses. All three of these questions were addressed in the Nutrition Evidence Library (NEL) Dietary Patterns Systematic Review Project. This project was supported by USDA's Center for Nutrition Policy and Promotion and was informed by a Technical Expert Collaborative of experts in dietary patterns research.[2] Additionally, the DGAC reviewed reports from systematic reviews recently conducted by the National Heart, Lung, and Blood Institute (NHLBI) that included dietary patterns research. For CVD, the DGAC used the NHLBI *Lifestyle Interventions to Reduce Cardiovascular Risk: Systematic Evidence Review from the Lifestyle Work Group* and the associated American Heart Association (AHA)/ American College of Cardiology (ACC) *Guideline on Lifestyle Management to Reduce Cardiovascular Risk*.[31] For body weight, the DGAC used the NHLBI *Managing Overweight and Obesity in Adults: Systematic Evidence Review from the Obesity Expert Panel* and the associated AHA/ACC/ The Obesity Society (TOS) *Guideline for the Management of Overweight and Obesity in Adults*.[1] For all three questions, in an attempt to capture new research published since the searches for these systematic reviews were completed, the Committee considered existing systematic reviews and meta-analyses published in peer-reviewed journals since 2008. The existing systematic reviews and meta-analyses considered

by the DGAC had to meet the general inclusion criteria of the DGAC, and were required to consider dietary patterns and the outcomes of interest.

Search Strategy for Existing Systematic Reviews/Meta-Analyses

(“diet quality” OR dietary pattern* OR diet pattern* OR eating pattern* OR food pattern* OR eating habit* OR dietary habit* OR food habit* OR dietary profile* OR food profile* OR diet profile* OR eating profile* OR dietary guideline* OR dietary recommendation* OR food intake pattern* OR dietary intake pattern* OR diet pattern* OR eating style*) OR

(DASH OR (dietary approaches to stop hypertension) OR "Diet, Mediterranean"[Mesh] OR vegan* OR vegetarian* OR "Diet, Vegetarian"[Mesh] OR “prudent diet” OR “western diet” OR nordiet OR omniheart OR (Optimal Macronutrient Intake Trial to Prevent Heart Disease) OR ((Okinawa* OR "Ethnic Groups"[Mesh] OR “plant based” OR Mediterranean[tiab]OR Nordic) AND (diet[mh] OR diet[tiab] OR food[mh])))
OR
("Guideline Adherence"[Mesh] AND (diet OR food OR eating OR eat OR dietary OR feeding OR nutrition OR nutrient*)) OR (adherence AND (nutrient* OR nutrition OR diet OR dietary OR food OR eat OR eating) AND (guideline* OR guidance OR recommendation*)) OR
(dietary score* OR adequacy index* OR kidmed OR Diet Quality Index* OR Food Score* OR Diet Score* OR MedDietScore OR Dietary Pattern Score* OR “healthy eating index”)OR

((index*[ti] OR score*[ti] OR indexes OR scoring[ti] indices[ti]) AND (dietary[ti] OR nutrient*[ti] OR eating[tiab] OR OR food[ti] OR food[mh] OR diet[ti] OR diet[mh]) AND (pattern* OR habit* OR profile*))

Body weight:
("body size"[tiab] OR body size[mh] OR obesity[tiab] OR obese[tiab] OR obesity[mh] OR overweight [tiab] OR adiposity[tiab] OR adiposity[mh] OR "body weight"[tiab] OR body weight[mh] OR “body-weight related”[tiab] OR "weight gain"[tiab] OR weight gain[mh] OR "weight loss"[tiab] OR Body Weights and Measures[Majr] OR overweight[tiab] OR "Body Composition"[mh] OR "body fat"[tiab] OR adipos*[tiab] OR weight[ti] OR waist[ti] OR "Anthropometry"[Mesh:noexp] OR “body mass index”[tiab] OR BMI[tiab] OR “weight status”[tiab] OR adipose tissue [mh] OR "healthy weight"[tiab] OR waist circumference[mh] OR “body fat mass”[tiab] OR body weight changes[mh] OR “waist circumference”[tiab])

CVD:
"Mortality"[Mesh] OR mortality[tiab] OR "blood pressure"[tiab] OR "blood pressure"[mesh] OR "cardiovascular diseases"[mh:noexp] OR cardiovascular disease*[tiab] OR cardiovascular event*[tiab] OR "cholesterol/blood"[mh] OR "Cholesterol, HDL"[Mesh] OR cholesterol[tiab] OR "Cholesterol, Dietary"[Mesh] OR triglyceride* OR stroke[tiab] OR "stroke"[Mesh] OR "Lipids/blood"[Mesh] OR hypertension[tiab] OR "Myocardial Infarction"[Mesh] OR "Myocardial Infarction"[tiab] OR "Heart Failure"[Mesh] OR "Heart Arrest"[Mesh] OR "Myocardial

Ischemia"[Mesh] OR "heart failure"[tiab] OR "heart arrest"[tiab] OR "Myocardial Ischemia"[tiab] OR hypertension[mh]

T2D:
("insulin resistance"[mh] OR "insulin"[ti] OR inflammation[ti] OR glucose intoleran*[ti] OR "Glucose Intolerance"[Mesh] OR diabetes[ti] OR "Diabetes Mellitus, Type 2"[Mesh] OR "Hemoglobin A, Glycosylated"[Mesh] OR "hemoglobin A1c "[ti] OR ("impaired fasting" AND (glucose OR glycemi*)) OR "onset diabetes" OR "impaired glucose" OR "insulin sensitivity")

AND limit to: systematic[sb] OR systematic review* OR meta-analys* OR meta analys*

Inclusion Criteria

Date Range:
- Published between January 2008 and April 2014 (in English in a peer-reviewed journal)

Study Design:
- Systematic review and/or meta-analysis that included randomized controlled trials and/or prospective cohort studies

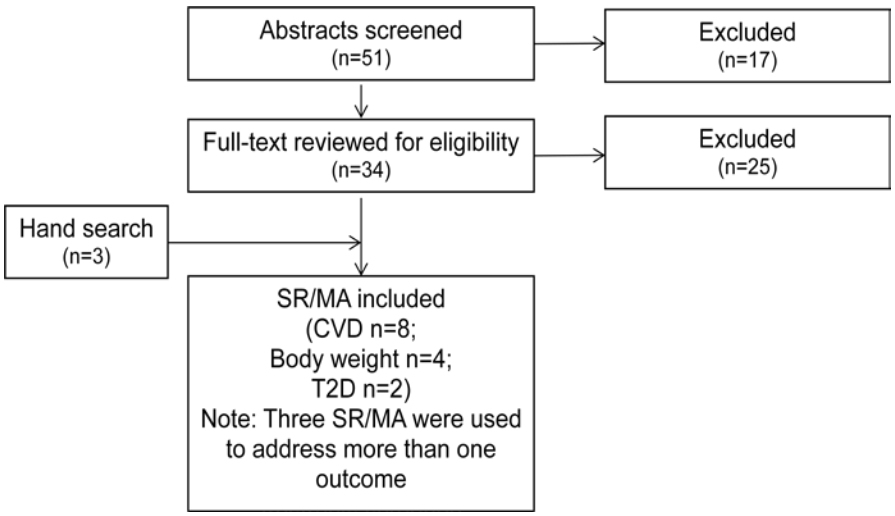
Study Subjects:
- Reviews that included studies from high or very high human development (2012 Human Development Index)
- Healthy or at elevated chronic disease risk

Intervention/Exposure:
- Dietary pattern - The quantities, proportions, variety, or combination of different foods, drinks, and nutrients (when available) in diets, and the frequency with which they are habitually consumed.

Outcome:
- CVD: LDL-cholesterol, HDL-cholesterol, triglycerides, blood pressure, incidence of CVD, CVD-related death, myocardial infarction, or stroke
- Body weight: Body mass index, body weight, percent body fat, waist circumference, incidence of overweight or obesity
- Type 2 diabetes: Glucose intolerance, insulin resistance, or incidence of type 2 diabetes

Quality:
- Reviews rated 8-11 on AMSTAR (A measurement tool for the 'assessment of multiple systematic reviews')

Search Results



Excluded Articles with Reason for Exclusion

32. Ajala O, English P, Pinkney J. Systematic review and meta-analysis of different dietary approaches to the management of type 2 diabetes. Am J Clin Nutr. 2013 Mar;97(3):505-16. doi: 10.3945/ajcn.112.042457. Epub 2013 Jan 30. Review. PubMed PMID: 23364002. EXCLUDE: Examined subjects diagnosed with type 2 diabetes (management of type 2 diabetes)

33. Akesson A, Andersen LF, Kristjánsdóttir AG, Roos E, Trolle E, Voutilainen E, Wirfält E. Health effects associated with foods characteristic of the Nordic diet: a systematic literature review. Food Nutr Res. 2013;57. doi: 10.3402/fnr.v57i0.22790. Review. PubMed PMID: 24130513; PubMed Central PMCID: PMC3795297. EXCLUDE: Examined individual components of the diet, not dietary patterns as defined by the Subcommittee

34. Aljadani H., Patterson A., Sibbritt D., Collins C. The association between dietary patterns and weight change in adults over time: A systematic review of studies with follow up. JBI Database of Systematic Reviews and Implementation Reports 2013 11:8 (272-316) EXCLUDE: Did not examine dietary patterns as defined by the Subcommittee

35. Al-Khudairy L, Stranges S, Kumar S, Al-Daghri N, Rees K. Dietary factors and type 2 diabetes in the Middle East: what is the evidence for an association?--a systematic review. Nutrients. 2013 Sep 26;5(10):3871-97. doi: 10.3390/nu5103871. PubMed PMID: 24077241; PubMed Central PMCID: PMC3820049. EXCLUDE: Not all countries in the Middle East are of high or very high development according to the Human Development Index

36. Barbaresko J, Koch M, Schulze MB, Nöthlings U. Dietary pattern analysis and biomarkers of low-grade inflammation: a systematic literature review. Nutr Rev. 2013 Aug;71(8):511-27. doi: 10.1111/nure.12035. Epub 2013 Jun 13. Review. PubMed PMID: 23865797. EXCLUDE: Outcomes were inflammatory markers, which were not included as intermediate outcomes in the Subcommittee's analytical framework

37. Buckland G, Bach A, Serra-Majem L. Obesity and the Mediterranean diet: a systematic review of observational and intervention studies. Obes Rev. 2008 Nov;9(6):582-93. doi: 10.1111/j.1467-789X.2008.00503.x. Epub 2008 Jun 10. Review. PubMed PMID: 18547378 EXCLUDE: AMSTAR rating was 7 of 11

38. Carter P, Achana F, Troughton J, Gray LJ, Khunti K, Davies MJ. A Mediterranean diet improves HbA1c but not fasting blood glucose compared to alternative dietary strategies: a network meta-analysis. J Hum Nutr Diet. 2013 Jun 22. doi: 10.1111/jhn.12138. [Epub ahead of print] PubMed PMID: 23790149. EXCLUDE: Half of the studies included in the meta-analyses only included participants with T2D or CVD

39. Chan M.Y., Yulianna Y. Effect of mediterranean diet components on selected cardiovascular risk factors, all-cause mortality and cardiovascular mortality: Systematic review. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (1093) EXCLUDE: Abstract, not a full article

40. Defagó M., Elorriaga N., Irazola V., Rubinstein A.Association between food patterns and biomarkers of endothelial function: A systematic review. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (1282) EXCLUDE: Outcomes were biomarkers of endothelial function, which were not included as intermediate outcomes in the Subcommittee's analytical framework

41. Dong JY, Zhang ZL, Wang PY, Qin LQ. Effects of high-protein diets on body weight, glycaemic control, blood lipids and blood pressure in type 2 diabetes: meta-analysis of randomised controlled trials. Br J Nutr. 2013 Sep 14;110(5):781-9. doi: 10.1017/S0007114513002055. Epub 2013 Jul 5. Review. PubMed PMID: 23829939. EXCLUDE: Participants were diagnosed with type 2 diabetes

42. Esposito K, Kastorini CM, Panagiotakos DB, Giugliano D. Mediterranean diet and metabolic syndrome: an updated systematic review. Rev Endocr Metab Disord. 2013 Sep;14(3):255-63. doi: 10.1007/s11154-013-9253-9. PubMed PMID: 23982678. EXCLUDE: Included cross-sectional studies; examined incidence of metabolic syndrome, which is outside the scope of the Subcommittee's analytical framework

43. Esposito K, Kastorini CM, Panagiotakos DB, Giugliano D. Prevention of type 2 diabetes by dietary patterns: a systematic review of prospective studies and meta-analysis. Metab Syndr Relat Disord. 2010 Dec;8(6):471-6. doi: 10.1089/met.2010.0009. Epub 2010 Oct 19. Review. PubMed PMID: 20958207. EXCLUDE: Of the 10 included studies, 8 were included in the NEL and Alhamzi reviews being considered by the Committee

44. Esposito K, Maiorino MI, Ceriello A, Giugliano D. Prevention and control of type 2 diabetes by Mediterranean diet: a systematic review. Diabetes Res Clin Pract. 2010 Aug;89(2):97-102. doi: 10.1016/j.diabres.2010.04.019. Epub 2010 May 23. Review. PubMed PMID: 20546959. EXCLUDE: Only 3 studies looked at prevention and one was cross-sectional

45. Grosso G, Mistretta A, Frigiola A, Gruttadauria S, Biondi A, Basile F, Vitaglione P, D'Orazio N, Galvano F. Mediterranean diet and cardiovascular risk factors: a systematic review. Crit Rev Food Sci Nutr. 2014;54(5):593-610. doi: 10.1080/10408398.2011.596955. PubMed PMID: 24261534. EXCLUDE: Included cross-sectional studies; included various outcomes

not included in the Subcommittee's analytical framework, including incidence of metabolic syndrome, CRP, IL-6, liver transaminases, etc.

46. Hu T, Mills KT, Yao L, Demanelis K, Eloustaz M, Yancy WS Jr, Kelly TN, He J, Bazzano LA. Effects of low-carbohydrate diets versus low-fat diets on metabolic risk factors: a meta-analysis of randomized controlled clinical trials. Am J Epidemiol. 2012 Oct 1;176 Suppl 7:S44-54. doi: 10.1093/aje/kws264. PubMed PMID: 23035144; PubMed Central PMCID: PMC3530364. EXCLUDE: Did not examine dietary patterns as described by the Subcommittee

47. Joung H, Hong S, Song Y, Ahn BC, Park MJ. Dietary patterns and metabolic syndrome risk factors among adolescents. Korean J Pediatr. 2012 Apr;55(4):128-35. doi: 10.3345/kjp.2012.55.4.128. Epub 2012 Apr 30. PubMed PMID: 22574073; PubMed Central PMCID: PMC3346835. EXCLUDE: Meta-analysis of cross-sectional data

48. Kant AK. Dietary patterns: biomarkers and chronic disease risk. Appl Physiol Nutr Metab. 2010 Apr;35(2):199-206. doi: 10.1139/H10-005. Review. PubMed PMID: 20383233. EXCLUDE: Narrative review

49. Kastorini CM, Milionis HJ, Esposito K, Giugliano D, Goudevenos JA, Panagiotakos DB. The effect of Mediterranean diet on metabolic syndrome and its components: a meta-analysis of 50 studies and 534,906 individuals. J Am Coll Cardiol. 2011 Mar 15;57(11):1299-313. doi: 10.1016/j.jacc.2010.09.073. PubMed PMID: 21392646. EXCLUDE: Included cross-sectional studies

50. Kastorini CM, Milionis HJ, Goudevenos JA, Panagiotakos DB. Mediterranean diet and coronary heart disease: is obesity a link? - A systematic review. Nutr Metab Cardiovasc Dis. 2010 Sep;20(7):536-51. doi: 10.1016/j.numecd.2010.04.006. Review. PubMed PMID: 20708148. EXCLUDE: Included cross-sectional studies and secondary prevention studies

51. Kastorini CM, Panagiotakos DB. Dietary patterns and prevention of type 2 diabetes: from research to clinical practice; a systematic review. Curr Diabetes Rev. 2009 Nov;5(4):221-7. Review. PubMed PMID: 19531025. EXCLUDE: Included cross-sectional and case-control studies

52. Kwan MW, Wong MC, Wang HH, Liu KQ, Lee CL, Yan BP, Yu CM, Griffiths SM. Compliance with the Dietary Approaches to Stop Hypertension (DASH) diet: a systematic review. PLoS One. 2013;8(10):e78412. doi: 10.1371/journal.pone.0078412. PubMed PMID: 24205227; PubMed Central PMCID: PMC3813594. EXCLUDE: Examined compliance to the DASH diet

53. Maghsoudi Z, Azadbakht L. How dietary patterns could have a role in prevention, progression, or management of diabetes mellitus? Review on the current evidence. J Res Med Sci. 2012 Jul;17(7):694-709. PubMed PMID: 23798934; PubMed Central PMCID: PMC3685790. EXCLUDE: Included cross-sectional studies and seminars and symposiums

54. Marshall S, Burrows T, Collins CE. Systematic review of diet quality indices and their associations with health-related outcomes in children and adolescents. J Hum Nutr Diet. 2014 Feb 13. doi: 10.1111/jhn.12208. [Epub ahead of print] PubMed PMID: 24524271. EXCLUDE: Included cross-sectional and case-control studies; included abstracts; focus of

review was to describe indices being used with children and adolescents – only brief mention of body weight and no conclusions drawn.

55. Martínez-González MÁ, Martín-Calvo N. The major European dietary patterns and metabolic syndrome. Rev Endocr Metab Disord. 2013 Sep;14(3):265-71. doi: 10.1007/s11154-013-9264-6. PubMed PMID: 23979531. EXCLUDE: Narrative review

56. McEvoy C., Cardwell C., Woodside J., Young I., Hunter S., McKinley M. A systematic review and meta-analysis examining 'a posteriori' dietary patterns and risk of type 2 diabetes. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (864) EXCLUDE: Abstract, not a full article

57. Mente A, de Koning L, Shannon HS, Anand SS. A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease. Arch Intern Med. 2009 Apr 13;169(7):659-69. doi:10.1001/archinternmed.2009.38. Review. PubMed PMID: 19364995. EXCLUDE: Some studies included secondary prevention, did not provide list of included articles; describes dietary factors, rather than dietary pattern as defined by the SC

58. Nordmann A.J., Suter K., Tuttle K.R., Estruch R., Shai I., Bucher H. Meta-analysis of Mediterranean versus low-fat diets to improve cardiovascular risk factors. European Heart Journal 2010 31 SUPPL. 1 (940) EXCLUDE: Abstract, not a full article

59. Osei-Assibey G, Boachie C. Dietary interventions for weight loss and cardiovascular risk reduction in people of African ancestry (blacks): a systematic review. Public Health Nutr. 2012 Jan;15(1):110-5. doi: 10.1017/S1368980011001121. Epub 2011 Jun 1. Review. PubMed PMID: 21729478. EXCLUDE: Examined dietary interventions, in general, not dietary patterns specifically

60. Psaltopoulou T, Sergentanis TN, Panagiotakos DB, Sergentanis IN, Kosti R, Scarmeas N. Mediterranean diet, stroke, cognitive impairment, and depression: A meta-analysis. Ann Neurol. 2013 Oct;74(4):580-91. doi: 10.1002/ana.23944. Epub 2013 Sep 16. PubMed PMID: 23720230. EXCLUDE: Included case-control studies

61. Santos FL, Esteves SS, da Costa Pereira A, Yancy WS Jr, Nunes JP. Systematic review and meta-analysis of clinical trials of the effects of low carbohydrate diets on cardiovascular risk factors. Obes Rev. 2012 Nov;13(11):1048-66. doi: 10.1111/j.1467-789X.2012.01021.x. Epub 2012 Aug 21. Review. PubMed PMID: 22905670. EXCLUDE: Did not examine dietary patterns as described by the SC

62. Schwingshackl L, Hoffmann G. Long-term effects of low-fat diets either low or high in protein on cardiovascular and metabolic risk factors: a systematic review and meta-analysis. Nutr J. 2013 Apr 15;12:48. doi: 10.1186/1475-2891-12-48. Review. PubMed PMID: 23587198; PubMed Central PMCID: PMC3636027. EXCLUDE: Did not examine dietary patterns as described by the SC

63. Shirani F, Salehi-Abargouei A, Azadbakht L. Effects of Dietary Approaches to Stop Hypertension (DASH) diet on some risk for developing type 2 diabetes: a systematic review and meta-analysis on controlled clinical trials. Nutrition. 2013 Jul-Aug;29(7-8):939-47. doi:

10.1016/j.nut.2012.12.021. Epub 2013 Mar 6. Review. PubMed PMID: 23473733. EXCLUDE: Review included articles with less than 30 participants per study arm

64. Smithers LG, Golley RK, Brazionis L, Lynch JW. Characterizing whole diets of young children from developed countries and the association between diet and health: a systematic review. Nutr Rev. 2011 Aug;69(8):449-67. doi: 10.1111/j.1753-4887.2011.00407.x. Review. PubMed PMID: 21790612. EXCLUDE: Included cross-sectional studies; focus of the review was to describe what is currently known about measures of dietary patterns in early life and the general association between dietary patterns and child health and development – only brief mention of body weight

65. Sofi F, Abbate R, Gensini GF, Casini A. Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis. Am J Clin Nutr. 2010 Nov;92(5):1189-96. doi: 10.3945/ajcn.2010.29673. Epub 2010 Sep 1. Review. PubMed PMID: 20810976. EXCLUDE: Meta-analysis captured in Sofi 2013

66. Sofi F, Cesari F, Abbate R, Gensini GF, Casini A. Adherence to Mediterranean diet and health status: meta-analysis. BMJ. 2008 Sep 11;337:a1344. doi: 10.1136/bmj.a1344. Review. PubMed PMID: 18786971; PubMed Central PMCID: PMC2533524. EXCLUDE: Meta-analysis captured in Sofi 2013

67. Sofi F. The Mediterranean diet revisited: evidence of its effectiveness grows. Curr Opin Cardiol. 2009 Sep;24(5):442-6. doi: 10.1097/HCO.0b013e32832f056e. Review. PubMed PMID: 19550306. EXCLUDE: Narrative review

68. Summerbell CD, Douthwaite W, Whittaker V, Ells LJ, Hillier F, Smith S, Kelly S, Edmunds LD, Macdonald I. The association between diet and physical activity and subsequent excess weight gain and obesity assessed at 5 years of age or older: a systematic review of the epidemiological evidence. Int J Obes (Lond). 2009 Jul;33 Suppl 3:S1-92. doi: 10.1038/ijo.2009.80. Review. Erratum in: Int J Obes (Lond). 2010 Apr;34(4):789. abstract no. 5.3 only. Int J Obes (Lond). 2010 Apr;34(4):788. abstract no. 5.2 only. PubMed PMID: 19597430. EXCLUDE: Considered various aspects of eating, including fast food intake, frequency of eating, night eating, individual food groups, as well as physical activity, etc.; included relevant section with 6 studies, 1 considered glycemic index/load, and 4 included in NEL review

69. Tyrovolas S, Panagiotakos DB. The role of Mediterranean type of diet on the development of cancer and cardiovascular disease, in the elderly: a systematic review. Maturitas. 2010 Feb;65(2):122-30. doi: 10.1016/j.maturitas.2009.07.003. Epub 2009 Aug 4. Review. PubMed PMID: 19656644. EXCLUDE: Narrative review; considers cross-sectional and case-control studies

70. Vadiveloo M, Dixon LB, Parekh N. Associations between dietary variety and measures of body adiposity: a systematic review of epidemiological studies. Br J Nutr. 2013 May;109(9):1557-72. doi: 10.1017/S0007114512006150. Epub 2013 Feb 27. Review. PubMed PMID: 23445540. EXCLUDE: Examined dietary variety, not dietary patterns

71. Wheeler ML, Dunbar SA, Jaacks LM, Karmally W, Mayer-Davis EJ, Wylie-Rosett J, Yancy WS Jr. Macronutrients, food groups, and eating patterns in the management of diabetes: a systematic review of the literature, 2010. Diabetes Care. 2012 Feb;35(2):434-45. doi:

10.2337/dc11-2216. Review. PubMed PMID: 22275443; PubMed Central PMCID: PMC3263899. EXCLUDE: Only included studies with people with type 2 diabetes

72. Yuliana Y., Chan M.Y. Effect of mediterranean diet components on selected cardiovascular risk factors, all-cause mortality and cardiovascular mortality: Systematic review. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (981) EXCLUDE: Abstract, not a full article

73. Zhang Z, Wang J, Chen S, Wei Z, Li Z, Zhao S, Lu W. Comparison of Vegetarian Diets and Omnivorous Diets on Plasma Level of HDL-c: A Meta-Analysis. PLoS One. 2014 Mar 26;9(3):e92609. doi: 10.1371/journal.pone.0092609. eCollection 2014.PubMed PMID: 24671216. EXCLUDE: Included cross-sectional studies in meta-analysis