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December 11, 2019

Prevention of ASCVD in South Asians: Impact of Diet Modification and Physical Activity as Primary Intervention



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M. Louise Fitzpatrick College of Nursing

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## OBJECTIVES

1. Describe the impact of Western Acculturation on the dietary patterns of South Asians
2. Explain the impact of diet and lifestyle modification on ASCVD risk in South Asians
3. Review the South Asian diet and lifestyle goals and resources to help practitioners implement culturally tailored AHA/ACC recommended heart healthy dietary patterns.

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### NUTRITION FUTURE FORWARD: ARE WE READY FOR OUT OF THE BOX THINKING?

March 6, 2020  
9 AM-4 PM  
Driscoll Hall Auditorium  
Villanova University

RNs: 6 contact hours  
RD/RDN/DTR: 6 CPEUs

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## CE CREDITS

- This webinar awards 1 contact hour for nurses and 1 CPEU for dietitians
- Suggested CDR Learning Need Codes: 3020, 5160, 5370 and 6000
- Level 2
- CDR Performance Indicators: 8.2.1, 8.2.4, 8.3.1, 8.3.6

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
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## Prevention of ASCVD in South Asians: Impact of Diet Modification and Physical Activity as Primary Intervention



**Geeta Sikand, MA, RDN, FAND, CDE, CLS, FNLA**  
 Director of Nutrition  
 University of California Irvine Preventive Cardiology Program

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## DISCLOSURE

The planners and presenter of this program have no conflicts of interest to disclose.

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**Prevention of ASCVD in South Asians  
Impact of Diet Modification and  
Physical Activity in Primary Prevention**

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**Disclosures**

- No financial relationships to disclose

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**Objectives**

1. Enumerate the impact of food acculturation on the dietary patterns of South Asians (SA) and associated ASCVD risk factors.
2. Explain the impact of diet and lifestyle modification on ASCVD risk factors.
3. Describe SA diet and lifestyle goals and resources to help practitioners implement culturally tailored AHA/ACC recommended heart healthy dietary patterns.

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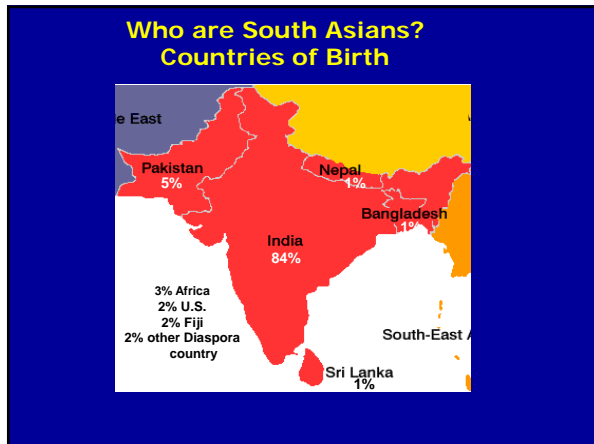
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### WHO Facts: South Asians

- CHD strikes South Asians at an *earlier age* (almost 33% earlier) and with higher mortality rates than other demographics.
- 50% of all heart attacks in Indian men occur under 50 years of age and 25% of all heart attacks occur under 40 years of age.
- India accounts for approximately 60% of the world's heart disease burden, despite less than 20% of the world's population.
- India: World's capital for diabetes e.g. in Hyderabad, India, 20% of the entire adult population is diabetic.

WHO, 2011; Chiu M et al., Diabetes Care, 2011

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### ACC/AHA 2018 Cholesterol Management Guidelines: Risk-Enhancing Factors

- Family history of premature ASCVD
- Primary hypercholesterolemia
- Metabolic syndrome
- Chronic kidney disease
- Chronic inflammatory conditions
- Premature menopause
- High-risk race/ethnicities (e.g., South Asian ancestry)
- Lipid/biomarkers
- Elevated high-sensitivity C-reactive protein
- Elevated Lp(a)

Grundy et al. Circulation 2018

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### South Asians: Background

- Relatively lower body weight (BMI)
- More central abdominal obesity
- Higher diabetes rate
- Higher risk of early heart disease
- ...little population-based U.S. data, and no longitudinal studies worldwide

Grundy Circulation 2018, Vogelman Circulation 2018, Jacobson J Clin. Lipidol. 2015

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### ASCVD Risk Factors in South Asians

- Relatively lower BMI but more central abdominal obesity.
- The lower BMI cut-point for over weight in South Asians was lowered from 24.9 to 23.0 due to early insulin resistance.
- High diabetes rate.
- High risk of early heart disease.

Grundy Circulation 2018, Vogelman Circulation 2018, Jacobson J Clin. Lipidol. 2015

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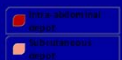
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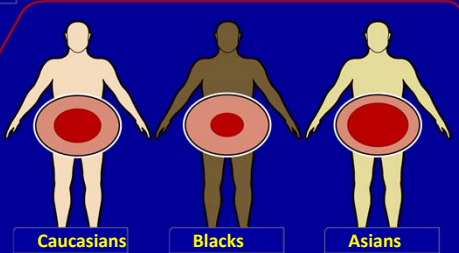
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### Intra-abdominal fat vs. Subcutaneous



Relative Accumulation of Intra-abdominal vs. Subcutaneous Depot



Eastwood SV, Tillin T, Wright A, et al. PLoS One. 2013;8(9):e75085

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### MASALA and MESA on Pooled Risk Equation

- Discordance between 10-year cardiovascular risk estimates using the ACC/ AHA 2013 estimator and coronary artery calcium in SA individuals was noted when compared with 5 racial/ethnic groups when Comparing MASALA and MESA studies

Al Rifai, M., *Atherosclerosis*, <https://doi.org/10.1016/j.atherosclerosis.2018.09.015>

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### Impact of Acculturation on Incident CVD in South Asians

2- to 3-fold higher risk of incident CVD in non-adherers to heart healthy behaviors e.g.

- Fewer fruits and vegetables
- Sedentary lifestyle
- Smokers
- Excessive alcohol use

Parackal et al. *Curr. Diabetes Rev.* 2017

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### Impact of Acculturation in South Asians' dietary patterns and ASCVD Risk

- Increased intake of animal protein, fried snacks, sweets & high-fat dairy: Increased insulin resistance and reduced HDL-C.
- Adhere to a traditional plus western dietary pattern: Increased obesity and hypertension.
- Adhere to a western dietary pattern: Increased risk for MetS.

Eriksen et al. *PLoS One.* 2015

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### SA Dietary Patterns vary by Region and Religion

However, all consume high amounts of saturated fat & refined carbs:

- Ghee, butter, whole milk, cream
- Shortening, fried foods, coconut oil
- Potatoes, white rice, pizza
- Repeat use of cooking oil in deep fried savory snacks
- Sugar sweetened beverages

Parackal Curr. Diabetes Rev. 2017

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### Is there a single SA dietary pattern?



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### Vegetarian vs. Non-Vegetarians Dietary Patterns

#### Non-vegetarians

- Obesity
- Dyslipidemia

Consume excessive animal products.

#### Vegetarians (Lacto)

- Dyslipidemia
- Overweight
- ASCVD

Consume excessive calories, refined carbs, saturated fats from high fat dairy (ghee, butter, whole milk, cream) and coconut oil.

Eriksen et al. *PLoSOne*. 2015

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### The Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study

- Kanaya et al. Acculturation & Subclinical Atherosclerosis among U.S. South Asians: Findings from the MASALA study. J Clin Exp Res Cardiol 2014.

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#### MASALA Study Design Kanaya et al. 2014



##### MASALA

- Ages 40-84 years
- N = 900
- Only South Asians
- Two sites (UCSF and NWU)
- Pilot study (n=150; 2006-2007)
- Oct 2010-March 2013

##### MESA

- Ages 45-84 years
- N = 6,500
- 4 ethnic groups
- 6 sites (Columbia, Hopkins, NWU, Minnesota, UCLA, Wake Forest)
- Started in 2000:
- Exam 5, 2010-2012

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#### Major Lifestyle Contributors to ASCVD in SA 2014 MASALA Study Findings



- Atherogenic diet
- Lack of physical activity
- Overweight: 75% of SA
- Diabetes prevalence: 23% (twice that of age and adiposity matched Chinese Americans (13%) and quadruple of Non Hispanic Whites (6%))

Kanaya et al. Acculturation & Subclinical Atherosclerosis among U.S. South Asians: Findings from the MASALA study. J Clin Exp Res Cardiol 2014.

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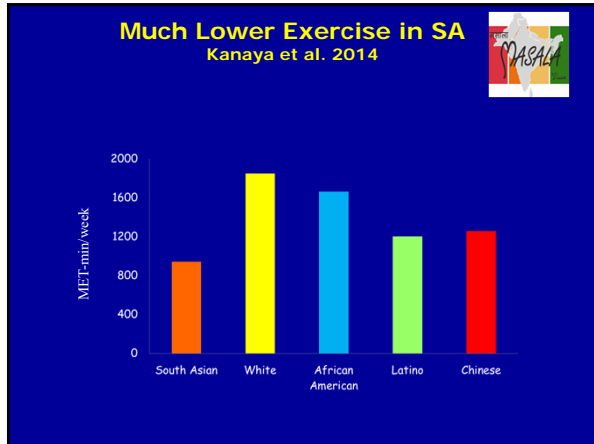
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### 2014 MASALA Study Findings

#### Three major dietary patterns



**1. High animal protein**



**2 A. Traditional Veg diet:**  
Fried snacks, sweets, high fat dairy.

**2 B. Mixed pattern=traditional 2A plus Western diet:** high fat dairy, pizza, potatoes, fast foods, sweetened beverages.

**3. Fruits, vegetables, nuts, and legumes pattern.**



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**The high animal protein diet pattern and the fried snacks, sweets & high-fat dairy diet patterns**

Were linked with

- Higher BMI
- Higher waist-cir
- Higher total-C
- Higher LDL-C
- Lower HDL-C
- Higher insulin resistance

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**Fruits, vegetables, nuts, and legumes pattern** →

- Lower rates of hypertension
- Fewer risk factors for ASCVD, diabetes, stroke, MetS

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**Summary of Changes in SA Dietary Patterns upon Acculturation in the West**

1. Decrease in beans, lentils, fruits & vegetables.
2. Increase in potatoes, dairy, oil, meat & fish.
3. Increase in fast foods due to increased frequency of eating out.
4. Increase in rich traditional foods e.g. refined carbs, sweets and snacks prepared with ghee, coconut oil, butter and shortening.
5. Increase in western desserts and snacks.

*Eriksen PLoS One. 2015*

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**2010 AHA Science Advisory in SA**

- Lack of adherence to a dietary pattern rich in vegetables and fruits was associated with 2- to 3-fold increased risk of incident CVD.

*Palaniappan et al. Circulation 2010*

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## Impact of Low Glycemic Load Carbs: Vegetables and Fruits

- "Global Burden of Disease Study 2010" showed low fruit and vegetable consumption was the top risk factor for causing greatest loss of health worldwide.



Lozano R et al. Lancet 2012

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## Fruits and Veggies are rich in Flavanoids

- Reduce oxidative stress
- Anti-inflammatory
- Prevent thrombus formation
- Improve Endothelium funx
- Improve lipids, BP & glycemia



Sikand, Kris-Etherton et al. Current Cardiology Reports February 2015.

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## Low Glycemic Load Carbs are rich in Flavanoids

Chickpeas, lentils, split peas



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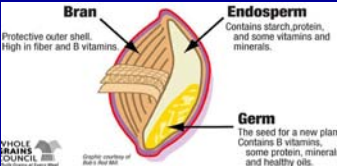
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## Traditional Whole Grains Low Glycemic Load Carbs

- Bulgar
- Barley
- Millet/ Ragi flour
- Whole oats
- Whole wheat
- Brown/wild rice
- Quinoa
- Whole rye

Sikand, Kris-Etherton et al. Current Cardiology Reports 2015

WHOLE GRAIN COUNCIL  
Quality seal of choice and best

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## Low Glycemic Load Carbs

- Decrease inflammation
  - ↓ CRP, Fibrinogen, other inflammatory markers
- Less Insulin resistance
  - ↓ FBS & A1c
- Improved Lipid profiles
  - ↓ TG's, ↑ HDL

- ↓ CAD risk 20-30%
- ↓ Progression to DM
- High Fiber/ → promote satiety



Sikand, Kris-Etherton et al. Current Cardiology Reports 2015

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## How much protein in plants?

- Beans (½ cup): 7-8 g
- Lentils (½ cup): 9 g
- Nuts and seeds (¼ cup): 5-7.5 g
- Tofu (firm) (½ cup): 10 g
- Edamame (½ cup): 8 g
- Tempeh (½ cup): 15 g
- Soy milk (1 cup): 8 g
- Peanut butter (2 TBS): 8 g

- Bread (whole wheat) 2 sl: 8 g
- Oatmeal (1 cup cooked): 8 g
- Whole wheat spaghetti (1 cup): 7.5 g
- Quinoa (1 cup cooked): 8 g

USDA National Nutrient Database

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## Objective 2

Describe the impact of diet and lifestyle modification on ASCVD risk factors in SA.

- ...little population-based data in U.S. (some in UK and Australia), and no longitudinal studies worldwide.

Grundy Circulation 2018, Vogelman Circulation 2018, Jacobson J Clin. Lipidol. 2015

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## Impact of Diet/Exercise Intervention in SA with Pre-diabetes and Diabetes

- 16 wks. non-randomized trial (Chicago)
- Women (pre-T2D)
- Intervention: Healthy diet plus twice weekly exercise intervention
- Improved: BMI
- 8 wks. RCT (SFO Bay area) (CURE-D study).
- Women with T2D
- Intervention: Twice weekly culturally relevant exercise (Bollywood dancing).
- Improved: BMI and A1c

Kandula et al. *Transl J Am Coll Sports Med.* 2016

Natesan et al. *BMJ Open Diabetes Res. Care.* 2015

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## South Asian Heart Lifestyle Intervention (SAHELI) Study Chicago

- 6 mos. intervention with focus on a healthy diet in group sessions.
- Improved: weight status, A1c, physical activity and stress management skills.

Kandula et al. *BMC Public Health* 2015

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### Diet and Ex Intervention in SA with Pre-diabetes

- 3 mos. SFO Bay Area
- Overweight women with insulin resistance.
- Intervention: Low calorie, relatively low carb dietary pattern.
- Improved: BMI, insulin sensitivity & CVD risk factors.
- 6 mos. NY community based
- Adults with pre-diabetes.
- Intervention: Healthy diet, exercise & stress management.
- Improved: BMI, BP, BG, total-C, food habits and exercise.

Backes AC et al. *Asia Pac J Clin Nutr.* 2008  
Islam NS et al. *Int J Environ Res Public Health.* 2014

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### Objective 3

- List diet and lifestyle goals and practical resources to help practitioners implement culturally relevant AHA/ACC recommended heart healthy dietary patterns in SA patients.

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### 2019 AHA/ACC Prevention Guidelines for Adults

- Eat a heart-healthy **dietary pattern**
- Emphasize **plant-based foods**, lean protein and fish.
  - Limit foods high in **saturated fats and dietary cholesterol**.
  - Minimize trans fat, sodium (salt), processed meats, refined carbs and sweetened beverages.
- Be **physically active** most days of the week, 150 min/wk moderate-intensity e.g. brisk walking or 75 min/wk for high intensity e.g. jogging.

Arnott et al. *Circulation* 2019

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### US and Indian ASCVD Prevention Guidelines Recommend

Same guiding principles for a heart healthy diet apply to SA.  
Implementation will differ based on cultural/ethnic and personal food preferences.

- DASH (Dietary Approaches to Stop Hypertension) dietary pattern
- Healthy Mediterranean-style dietary pattern (Healthy US dietary pattern)
- Healthy Vegetarian/Vegan dietary pattern.

Jacobson 2015, Vanhorn 2016, Iyengar 2016, Grundy 2018, Arnett 2019

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### Culturally Relevant Resources from Academy of Nutrition and Dietetics

Indians in Nutrition and Dietetics Member Interest Group of the Academy of Nutrition and Dietetics

- "Ready, Set, Start Counting" A carbohydrate counting tool for managing your diabetes for Asian Indians.
- Indian diet-healthy plate.
- Find a RD by zip code [www.eatright.org](http://www.eatright.org)

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### The INDIAN DIET-HEALTHY PLATE Academy of Nutrition and Dietetics

[www.eatright.org](http://www.eatright.org)



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**Recommended Dietary Patterns to Achieve Adherence to the AHA/ACC Guidelines**  
**Van Horn et al. AHA Scientific Statement**  
*Circulation 2016*

- Evidence-based dietary recommendations to facilitate adherence to the recent AHA/ACC Prevention Guidelines, 2015–2020 Dietary Guidelines for Americans to achieve AHA’s 2020 Strategic Impact Goals.
- Provide guidance for achieving adherence to a heart-healthy dietary pattern and accommodate personal, cultural and ethnic food choices.

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**2016 AHA Scientific Statement**  
**Recommendations for Populations Worldwide**

- Populations worldwide should follow the same guiding principles for a heart healthy dietary pattern to achieve the AHA 2020 goals.
- Implementation should be based on personal, socio-economic, cultural, ethnic and regional food preferences.
- Enhance acculturation by substituting heart-healthy ingredients in recipes for traditional foods.

Vanhorn et al. AHA Scientific Statement. Circulation 2016

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**Nutrition goals for optimizing lipids and reducing ASCVD risk factors**

- Culturally tailored personalized cardioprotective dietary pattern.
- Emphasize plant-based foods.
- Achieve 5-10% weight loss if overweight.
- Reduce saturated fat: <7% of energy intake.
- Dietary cholesterol: <200 mg/day.
- Reduce added sugars: <10% of energy intake.
- Increase viscous fiber: 5-10 g/day
- Plant sterols/stanols: 2 g/day.

Jacobson et al. J Clin Lipidol. 2015

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### Importance of Culturally Relevant Diet Counseling in SA

- High recidivism rate in subjects who tried to follow eating plans that were different from their usual dietary patterns (Sacks *N Eng J Med* 2009).
- Culturally tailored cardioprotective dietary pattern and exercise interventions led to improved BMI, A1c, insulin sensitivity and physical activity (Natesan *BMJ Open Diabetes Res. Care.* 2015).
- Multiple personalized sessions with a dietitian in over 5700 subjects (13 countries) led to improved LDL-C, TG, BMI and A1c (Sikand *J Clin Lipidol.* 2018).

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### Question

*In Outpatient adults, what is the effectiveness and cost benefit of medical nutrition therapy (MNT) provided by an RDN for management of dyslipidemia?*

*Sikand G et al. J Clin Lipidol October, 2018.*

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### Study Selection

- PubMed, MEDLINE, Worldcat.org
- Inclusion criteria:
  - English language
  - Adults over 18
  - MNT provided by a RDN in out patient setting
  - Published Jan 2003-Oct 2014
  - 10 or more subjects in the study with at least 65% completion rate
  - At least one outcome measure of dyslipidemia\*.

*Sikand G et al. J Clin Lipidol October, 2018.*

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## Clinical and cost benefits of medical nutrition therapy (MNT) by registered dietitians for management of dyslipidemia: A systematic review and meta-analysis

**METHODS**

Face to Face Medical Nutrition Therapy (MNT) → Cardio-metabolic factors → \$\$\$

34 primary studies (n=5704)  
\*including 10 randomized control trials (n=2526)

**RESULTS**

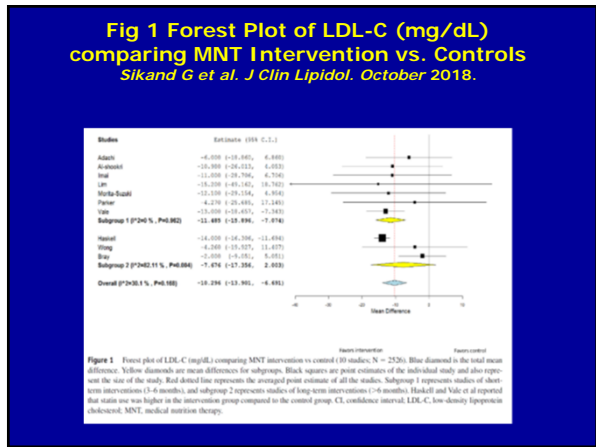
Total Chol (mg/dL): -9.9  
LDL (mg/dL): -10.3  
Triglycerides (mg/dL): -15.9  
A1c (%): -0.38  
BMI (kg/m<sup>2</sup>): -0.39

HDL (mg/dL): +1.6  
\$\$\$  
QALY (yrs): +10.75 to 10.78 yrs  
\$ saved/patient year reduced medic: +\$638 to +\$1456.00 per yr.

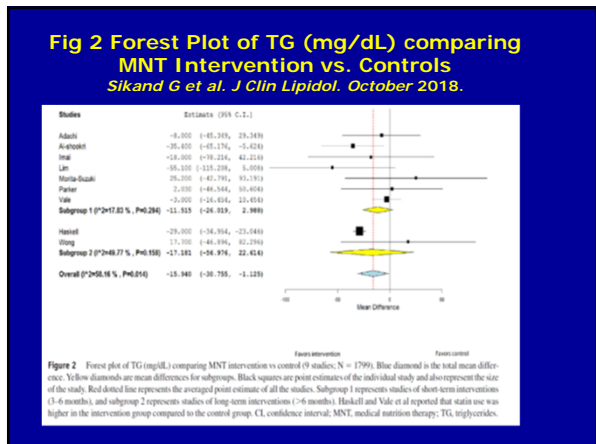
**CONCLUSIONS:** Evidence from this systematic review and meta-analysis demonstrates that multiple MNT sessions by an RDN are clinically effective and cost beneficial in patients with dyslipidemia and cardiometabolic risk factors.

Sikand G et al... (October 2018) 12, 1113–1122

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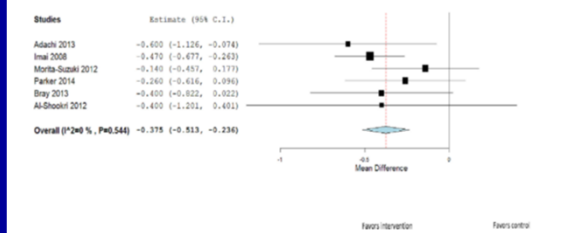


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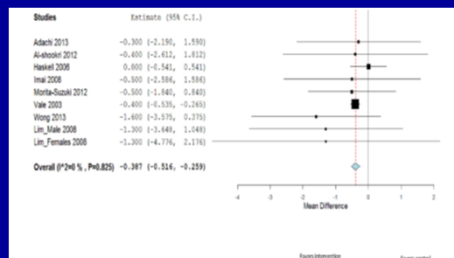
**Fig 4 Forest Plot of A1c (%) comparing MNT Intervention vs. Controls**  
*Sikand G et al. J Clin Lipidol. October 2018.*



**Figure 4** Forest plot of A1c (%) comparing MNT intervention vs control (6 studies; N = 1392). Blue diamond is the total mean difference. Black squares are point estimates of the individual study and also represent the size of the study. Red dotted line represents the averaged point estimate of all the studies. CI, confidence interval; MNT, medical nutrition therapy.

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**Fig 5 Forest Plot of BMI comparing MNT Intervention vs. Controls**  
*Sikand G et al. J Clin Lipidol. October 2018.*



**Figure 5** Forest plot of BMI (kg/m<sup>2</sup>) comparing MNT intervention vs control (8 studies; N = 1718). Blue diamond is the total mean difference. Black squares are point estimates of the individual study and also represent the size of the study. Red dotted line represents the averaged point estimate of all the studies. BMI, body mass index; CI, confidence interval; MNT, medical nutrition therapy.

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**2018 Systematic Review and Meta-analysis Highlights**

- Dietitian intervention in 5704 subjects (34 studies) led to improved LDL-C, TG, A1c, BMI, quality adjusted life years and reduced need for lipid-lowering medications.
- Multiple individual sessions with dietitian were clinically and cost beneficial.
- Benefits also reported when dietitian was part of a multidisciplinary health care team.

*Sikand et al. J Clin Lipidol. October 2018*

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### Take Away

- Culturally tailored counseling for a personalized cardio-protective dietary pattern.
- Weight loss of 3-5 % of body weight (overweight or obese).
- Reduced intake of saturated fat <7% of energy intake and dietary cholesterol <200 mg/day.
- Reduced intake of added sugars (<10% of total energy).
- 5 to 10 g/day of viscous fiber and 2 g/day of phytosterols.
- Culturally relevant multiple visits with a dietitian for diet and lifestyle counseling.

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### Summary

- Emphasize a plant based diet with vegetables, fruits, whole grains, legumes, non-tropical vegetable oils, unsalted nuts; non-fat dairy products; and poultry and fish for omnivores.
- Limit sweets, sugar sweetened beverages, fruit juices, salty or highly processed foods and fatty red meat or processed meat.
- Provide culturally appropriate counseling by a health care team. Include a registered dietitian, exercise specialist and stress management counselor.

Jacobson 2015, Vanhorn 2016, Iyengar 2016, Grundy 2018, Arnett 2019

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### Resources for Practioners

1. Van Horn L et al. Recommended dietary pattern to achieve adherence to the American Heart Association/American College of Cardiology (AHA/ACC) Guidelines: A Scientific Statement from the American Heart Association. *Circulation* 2016;134 e505-e529.
2. Sikand G. "Preventing Heart Disease in Asian Indians: Diet & Lifestyle Recommendations in "Indian Foods: AAPI's (American Association of Physicians from India). Guide to Nutrition, Health and Diabetes" 2011 second edition  
[https://www.ahca.com/sites/all/files/aapi\\_guide\\_to\\_nutrition\\_health\\_and\\_diabetes.pdf](https://www.ahca.com/sites/all/files/aapi_guide_to_nutrition_health_and_diabetes.pdf)
3. Palaniappan LP et al. Call to action: CVD in Asian Americans: a science advisory from the American Heart Association. *Circulation*. 2010;122:1242–1252. doi: 10.1161/CIR.0b013e3181f22af4.

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**NLA Resources for clinicians and patients from NLA**

[www.lipid.org/CLMT](http://www.lipid.org/CLMT)

Follow link to Clinical lifestyle Modification Toolkit (CLMT):

- Heart-Healthy Eating South Asian/ Indian Style
- DASH Dietary Pattern
- Mediterranean style Dietary Pattern
- Vegetarian/Vegan Dietary Pattern
- And many more

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**AT THE END OF THE DAY....  
FOOD AND CULTURE BRING PEOPLE TOGETHER**



**Thank You!**

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CENTER FOR OBESITY  
PREVENTION AND EDUCATION



The Ketogenic Diet: Risks, Benefits, and Alternatives  
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QUESTIONS & ANSWERS



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Moderator: Lisa K. Diewald MS, RD,  
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