

Diabetes and Heart Disease

INSTRUCTOR
Jill Weisenberger, MS, RDN, CDE

Diabetes and Heart Disease

Suggested CDR Learning Codes: 4040, 5160, 5190; Level 2

Learning Objectives:

1. Identify and quantify the increased risk of heart disease among people with diabetes.
2. Identify at least three ways to help people with diabetes lower their risk of heart disease.
3. Identify the most recent American Diabetes Association practice recommendations to reduce the risk of heart disease among people with diabetes.
4. Identify resources for teaching the relationship between diabetes and heart disease.



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MS, RDN, CDE

Session Description

Studies suggest that people with diabetes have the same risk of suffering a heart attack as those without diabetes who already have had a heart attack. This troubling correlation between diabetes and heart disease shows that RDs must be vigilant in stressing heart health for patients living with diabetes. This session reviews the link between diabetes and heart disease, discusses practice recommendations by the American Diabetes Association, and identifies strategies for heart disease prevention and treatment among people with diabetes.

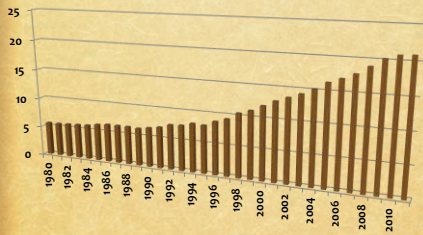
Prevalence of CHD

26.5 million 2011

- ♦ CHD prevalence is declining
- ♦ CDC: CHD mortality rate has declined continuously over 50 years
- ♦ 47% of the decline in CHD mortality is attributed to improvements in treatment and 44% to a reduction in risk factors

Ford ES et al. N Engl J Med 2007;356:2388-98.

Prevalence of Diabetes 1980 – 2011 (millions)

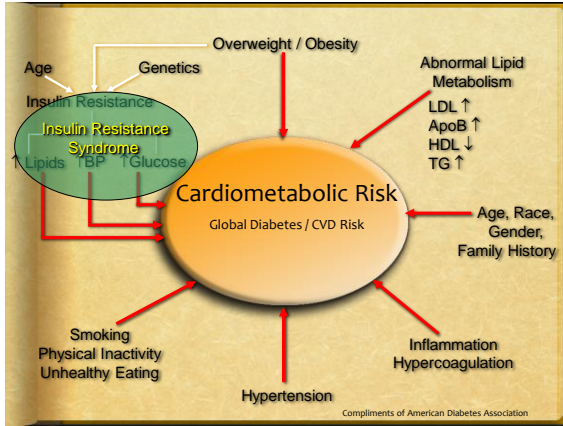


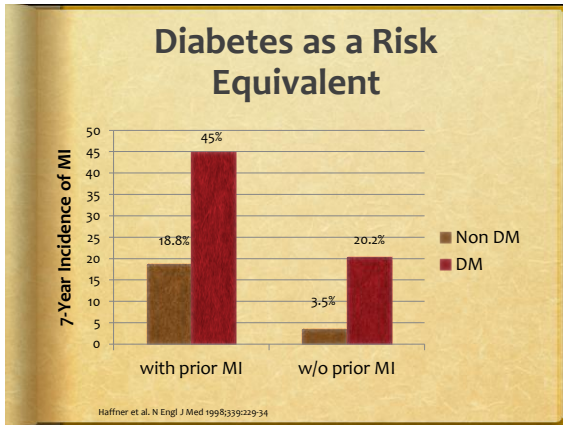
cdc.gov/diabetes/statistics/prev/national/figpersons.htm

Direct & Indirect Costs of CVD & Diabetes

	Estimated Direct Medical Costs	Estimated Indirect Medical Costs
CVD	\$296 billion	\$152 billion
Diabetes	\$116 billion	\$58 billion

Note: these figures may not account for overlap. Sources: 2008 statistics American Diabetes Association & American Heart Association





Impact of Diabetes on Cardiovascular Disease Risk and All-Cause Mortality in Older Men

Influence of Age at Onset, Diabetes Duration, and Established and Novel Risk Factors

S. Goya Wannamethee, PhD; A. Gerald Shaper, FRCP; Peter H. Whincup, FRCP, PhD; Lucy Lennon, MSc; Naveed Sattar, MD, FRCP

Background: We have examined the influence of age at onset and duration on the impact of diabetes mellitus on cardiovascular disease risk and all cause-mortality among men aged 60 to 79 years.

Methods: A prospective study of 4045 men aged 60 to 79 years followed up for a mean of 9 years, during which there were 372 major coronary heart disease (CHD) events (fatal and nonfatal myocardial infarction [MI]), 455 deaths from cardiovascular disease, and 1112 deaths from all causes. Men were classified as having (1) no history of MI and diabetes, (2) late-onset diabetes (diagnosed at ≥ 60 years or undiagnosed diabetes [fasting blood glucose level, >126.1 mg/dL]), (3) early-onset diabetes (diagnosed before age 60 years), or (4) prior MI.

Results: Men who had both MI and diabetes were excluded. Both early and late onset of diabetes were associated with a significantly increased risk of major CHD

events and all-cause mortality compared with nondiabetic men who had no CHD, even after adjustment for conventional risk factors and novel risk markers (levels of C-reactive protein and von Willebrand factor and renal dysfunction). Only men with early-onset diabetes (associated with a duration of 16.7 years) showed risk similar to those with previous MI and no diabetes. The adjusted relative risks (95% confidence intervals) for major CHD events were 1.00 (reference), 1.54 (1.07-2.21), 2.39 (1.41-4.05), and 2.51 (1.88-3.36) for groups 1 through 4, respectively.

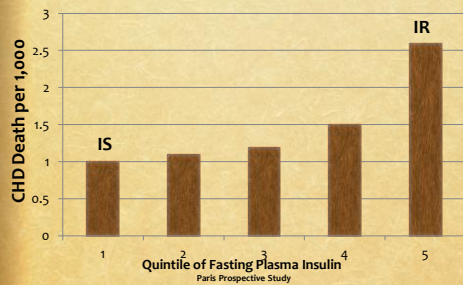
Conclusion: Both early and late onset of diabetes are associated with increased risk of major CHD events and mortality, but only early onset of diabetes (associated with ≥ 10 years' duration) appears to be a CHD equivalent.

Arch Intern Med. 2011;171(5):404-410

Diabetes as a Risk Factor

- Diabetes is an independent risk factor for CVD
- Hyperglycemia may
 - damage the endothelium
 - impair blood vessel dilation
 - modify LDL cholesterol
- Increased clotting
- Insulin resistance in type 2 diabetes may affect BP, lipids and more

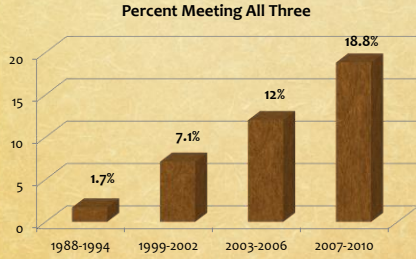
Insulin Resistance is Linked to CHD Mortality



ABCs of Diabetes Care

- ♦A: A1C
- ♦B: Blood Pressure
- ♦C: Cholesterol

ABCs of Diabetes Care



Diabetes Care. 2013;36(8):2271-9

ADA BG Targets

Measure	General Target
A1C	< 7%
Fasting and before meals	70 – 130 mg/dl
1 – 2 hours after eating	< 180 mg/dl

Diabetes.org

Targets should be individualized

Research on Glycemia (type 1)

- ♦ DCCT
 - A1C ~7 vs ~9
 - ♦ Retinopathy: 76%
 - ♦ Nephropathy: 50%
 - ♦ Neuropathy: 60%
 - ♦ CVD events: no difference
- ♦ EDIC
 - A1C ~8
 - ♦ Metabolic memory
 - ♦ CVD event: 42%
 - ♦ Combined nonfatal heart attack, stroke, death from CV causes: 57%

Nathan Diabetes Care 2014;37:9-16

Research on Glycemia (type 2)

- ♦ **UKPDS**
 - ♦ Overall microvascular complications: 25%
 - ♦ 1%↓ in A1c =
 - ♦ 35%↓ in risk of complications
 - ♦ 25%↓ in DM-related deaths
 - ♦ 7%↓ in all-cause mortality
 - ♦ CVD: trend toward reduction
- ♦ **UKPDS Follow-Up**
 - ♦ MI: 15% (sulfonylurea/insulin)
 - ♦ All-cause mortality: 13%
 - ♦ MI: 33% (metformin)
 - ♦ All-cause mortality: 27%

ADA Position Statement. Diabetes Care 2002;25:51
Klonoff. Journal of Diabetes Science and Technology 2008;2:26

Does A1C Affect CVD Risk?

- ♦ **ACCORD:** CVD or high risk
 - ♦ Stopped early b/c of increased death
 - ♦ Later analysis: highest risk among those with highest A1C
- ♦ **VADT:** uncontrolled (9.4%), insulin, max orals
 - ♦ Intensive control reduced CVD events in those with less atherosclerosis
 - ♦ Mortality in intensive group related to duration
 - ♦ < 15 years +
 - ♦ > 20 years -
- ♦ **Bottom line:** Intensive glycemic control may be harmful to people w/ diabetes of long duration, history of severe hypoglycemia, advanced atherosclerosis, elderly, frail

American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580

ADA A1C Goals

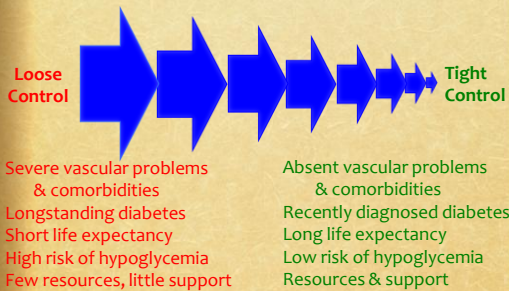
- ♦ < 7% (**< 7.5% elderly**)²
 - ♦ Associated with reduced microvascular complications
 - ♦ And reduced macrovascular disease, when implemented soon after diagnosis
- ♦ < 6.5%¹
 - ♦ Long life expectancy
 - ♦ Short duration of diabetes
 - ♦ No significant CVD
 - ♦ Low risk of hypoglycemia
- ♦ < 8% (**< 8.5% elderly**)³
 - ♦ Limited life expectancy
 - ♦ History of severe hypoglycemia
 - ♦ Extensive complications and comorbidities
- ♦ **Individualize**

¹American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580
²Kirkman et al. Diabetes Care 2012 35:2650-2664

What A1C Target?

- ♦ Mrs. R: 67 y.o.f
 - ♦ Type 2, 4 years, well-controlled
 - ♦ Comorbidity: HTN, controlled with medication
 - ♦ Walks daily with her husband
- ♦ Mr. L: 85 y.o.m.
 - ♦ New onset type 2, A1C = 9.1%
 - ♦ Comorbidities: HTN, hypothyroidism, dyslipidemia, osteoarthritis, moderate dementia
 - ♦ Lives in assisted living facility; wife is primary caregiver

Decision-Making for Glycemic Targets



Blood Pressure

Effects of Insulin Resistance

- ♦ Increased sympathetic nervous system
- ♦ Renal sodium retention
- ♦ Decreased nitric oxide



CDC/Amanda Mills

Effects of Intensive Blood-Pressure Control in Type 2 Diabetes Mellitus

The ACCORD Study Group*

ABSTRACT

BACKGROUND

There is no evidence from randomized trials to support a strategy of lowering systolic blood pressure below 135 to 140 mm Hg in persons with type 2 diabetes mellitus. We investigated whether therapy targeting normal systolic pressure (i.e., <120 mm Hg) reduces major cardiovascular events in participants with type 2 diabetes at high risk for cardiovascular events.

CONCLUSIONS

In patients with type 2 diabetes at high risk for cardiovascular events, targeting a systolic blood pressure of less than 120 mm Hg, as compared with less than 140 mm Hg, did not reduce the rate of a composite outcome of fatal and nonfatal major cardiovascular events. (ClinicalTrials.gov number, NCT00000620.)

Stroke: treat 89 people for 5 years; SAE

Hypertension

- Increases risk of CVD & microvascular complications
- Affects ~30% of Americans, but **most** people with diabetes
- 20% of Americans with HTN are unaware
- 47% have their HTN under control
- CDC: contributes to 1,000 deaths per day
- More common in men & African Americans
 - Develops earlier in African Americans & is more severe
- Affected by inactivity, poor diet, overweight and obesity, insulin resistance, tobacco use & excessive alcohol intake

ADA BP Goals & Treatment

- Initiate lifestyle changes if BP >120/80
- < 140/80 mm Hg
 - PROMPT treatment
- < 130 mm Hg SBP for younger, healthier
 - "without undue treatment burden"
- First drug should be an ACE inhibitor or ARB
 - Improved CVD outcomes
- DASH-style diet with sodium restriction

American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580

Sodium

- **ADA¹**
 - ≤ 2300 mg sodium/day
 - Individualized if have both DM and HTN
- **Dietary Guidelines for Americans**
 - 1500 mg – diabetes, HTN, chronic kidney disease, ≥ 51 years, African Americans
- **AHA²**
 - 2400 mg for people with HTN
 - Ideally 1500 mg
 - At least reduce by 1000 mg
 - As part of DASH

¹American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580
²2013 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk J Am Coll Cardiol 2013

Practice Pearls

- White coat HTN may lead to sustained HTN
- Most will need at least 2 drugs
- One should be taken at night
- Identify 3 – 5 changes to lower sodium intake



NCI/Daniel Stone

Classification of Blood Pressure in Adults

Blood Pressure Classification	Systolic Blood Pressure (mm Hg)	Diastolic Blood Pressure (mm Hg)
Normal	<120	and <80
Prehypertension	120-139	or 80-89
Hypertension Stage 1	140-159	or 90-99
Hypertension Stage 2	>160	or ≥100

Source: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure

Lifestyle & Behavior Changes

Modification	Approximate Lowering of SBP
Lose weight	5 – 20 mm Hg for 22 pound weight loss
Engage in regular cardiovascular activity	4 – 9 mm Hg
Alcohol in moderation	2 – 4 mm Hg
Reduce sodium to ≤ 2400 mg/day	2 – 8 mm Hg
Consume a DASH eating plan	8 – 14 mm Hg

Source: NHLBI

Cholesterol

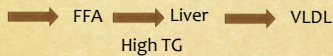
- Measure fasting lipid profile at least yearly
- Ok to measure every two years if patient has low risk values.



CDC/JimGathany

Type 2 Dyslipidemia

Insulin resistance results in increased lipolysis



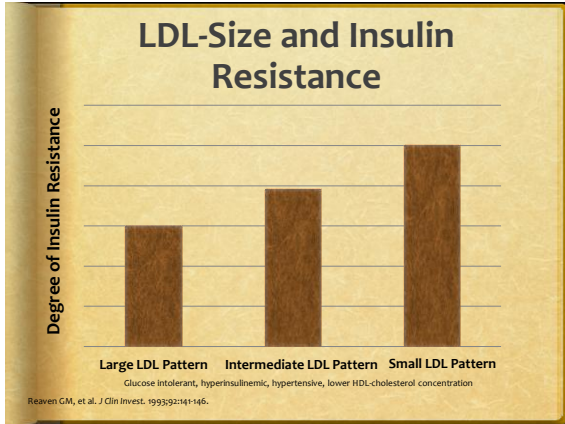
TG from VLDL \longrightarrow HDL & LDL

Cholesterol from HDL & LDL \longrightarrow VLDL

Low HDL Cholesterol

LDL is TG-rich \longrightarrow hydrolyzed by hepatic/lipoprotein lipase

Small LDL Particles



ADA Lipid Goals

Lipid	Target
LDL	< 100 mg/dl < 70 mg/dl if overt CVD *or 30-40% reduction
HDL	> 40 mg/dl in men > 50 mg/dl in women
Triglycerides	< 150 mg/dl

American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580

- ### ADA Treatment Recommendations¹
- Lifestyle modification for all
 - Statins –
 - overt CVD
 - > 40 years with at least 1 risk factor
 - LDL > 100 mg/dl or multiple risk factors
 - 21% reduction in vascular events, 9% reduction in all-cause mortality²
 - Meta-analysis, 18,686 pwd
 - Lower TG if at risk for pancreatitis
 - > 1000 mg/dl
 - Combination therapy isn't helpful
 - ACCORD Trial
- ¹American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580
²CTT Collaborators 2008 Lancet 371:117-125

ACC/AHA Guidelines

- No evidence for specific LDL-C goals
 - Out of date: *Treat to target, Lower is best*
- Statins for those at risk
 - Moderate intensity: $\geq 30\%$ LDL reduction
 - High intensity: $\geq 50\%$ LDL reduction
- 5 – 6 % Kcals from saturated fat
- There is insufficient evidence to determine whether restricting dietary cholesterol reduces LDL-C
- Follow DASH style diet
 - Okay in diabetes
 - OMNI Heart

©2013 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk J Am Coll Cardiol 2013

Look AHEAD Trial

- Research Question: In overweight people with type 2 diabetes, does an intensive lifestyle program designed to achieve and maintain weight loss protect against CVD?
- Headlines: **Lifestyle Changes Don't Protect the Diabetic Heart**
- Truth:
 - Control: final weight loss of 3.5%
 - Intervention: final weight loss of 6%, greater improved fitness, mobility, sleep apnea, QOL, depression, urinary incontinence
 - More insulin and cholesterol & BP meds in control group

N Engl J Med 2013; 369:145-54

Smoking Cessation

Smoking Dangers

- Endothelial dysfunction
- Decreases HDL cholesterol
- Increases LDL modification
- Increases blood clotting
- Increases blood pressure
- Decreases exercise tolerance
- Increases microvascular complications
- Even minimal smoking raises risk of CVD



National Cancer Institute/Bill Branson


Aspirin

75 – 162 mg

Used as secondary prevention

Primary prevention in high risk, types 1 & 2

High risk of bleeding



National Center of Diabetes and Digestive and Kidney Diseases, National

American Diabetes Association Standards of Medical Care in Diabetes-2014 Diabetes Care 2014 37:514-580

Nutrition Therapy Recommendations for the Management of Adults With Diabetes

ALISON B. EVERT, MS, RD, CDE ¹ JACQUE L. BOGHER, MS, RD, LD, CDE ² MARGAREE CYRESS, PhD, CANSF, CDE ³ STEPHANIE A. DENBAR, MPH, RD ⁴ MARION J. FRANZ, MS, RD, CDE ⁵ ELIZABETH J. MATHER-DAVIS, PhD, RD ⁶	JOSHUA J. NEMMELER, PHARM D, CGP, FASCP ⁷ ROBIN NWANOKO, MPH, RD, CDE ⁸ CASSANDRA L. VIEHL, MPH, RD ⁹ PATTI URBANSKI, MED, RD, LD, CDE ¹⁰ WILLIAM S. YANCY JR., MD, MHS ¹¹	in order to improve overall health and specifically to:
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A healthful eating pattern, regular physical activity, and often pharmacotherapy are key components of diabetes management. For many individuals with diabetes, the most challenging part of the treatment plan is determining what to eat. It is the position of the American Diabetes Association (ADA) that there is not a "one-size-fits-all" eating pattern for individuals with diabetes. The ADA also recognizes the integral role of nutrition therapy in overall diabetes management and has historically recommended that each person with diabetes be actively engaged in the development of a management of diabetes complications and gestational diabetes mellitus is not addressed in this review.

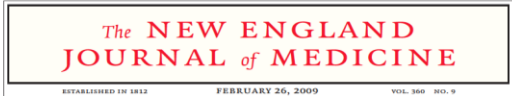
A grading system, developed by the ADA and modeled after existing methods, was utilized to clarify and codify the evidence that forms the basis for the recommendations (1) (Table 1). The level of evidence that supports each recommendation is listed after the recommendation using the letters A, B, C, or E.

A table linking recommendations to evidence can be reviewed at <http://professional.diabetes.org/nutrition>. Members of the Nutrition Recommendations Writing Group

in order to improve overall health and specifically to:

- Attain individualized glycemic, blood pressure, and lipid goals. General recommended goals from the ADA for these markers are as follows*:
 - o A1C <7%
 - o Blood pressure <140/90 mmHg.
 - o LDL cholesterol <100 mg/dL; triglycerides <150 mg/dL; HDL cholesterol >40 mg/dL for men; HDL cholesterol >50 mg/dL for women.
- Achieve and maintain body weight goals.
- Delay or prevent complications of diabetes.

■ To address individual nutrition needs based on personal and cultural preferences, health literacy and numeracy, access to healthful food choices, will



Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates

Frank M. Sacks, M.D., George A. Bray, M.D., Vincent J. Carey, Ph.D., Steven R. Smith, M.D., Donna H. Ryan, M.D., Stephen D. Anton, Ph.D., Katherine McManus, M.S., R.D., Catherine M. Champagne, Ph.D., Louise M. Bishop, M.S., R.D., Nancy Laranjo, B.A., Meryl S. Leboff, M.D., Jennifer C. Rood, Ph.D., Lilian de Jonge, Ph.D., Frank L. Greenway, M.D., Catherine M. Loria, Ph.D., Eva Obarzanek, Ph.D., and Donald A. Williamson, Ph.D.

ABSTRACT

BACKGROUND The possible advantage for weight loss of a diet that emphasizes protein, fat, or carbohydrate has not been established, and there are few studies that extend beyond 1 year.

From the Department of Nutrition, Harvard School of Public Health (F.M.S., L.M.B.); the Channing Laboratory (F.M.S., V.J.C., R.L.) and the Endocrine

CONCLUSIONS Reduced-calorie diets result in clinically meaningful weight loss regardless of which macronutrients they emphasize. (ClinicalTrials.gov number, NCT00072995.)

Dietary Fats

- **Saturated fatty acids**
 - Increase total cholesterol, LDL-cholesterol, CVD risk
 - Increase markers of insulin resistance, T2 DM risk
 - Stearic acid is neutral (chocolate)
- **Replace 5% of energy** from SFA with MUFAs or PUFAs to decrease risk & to improve insulin resistance
- **Omega-3 PUFAs**
 - Seafood providing an average of 250 mg per day of long-chain n-3 fatty acids is associated with reduced cardiac mortality from CHD or sudden death in persons with and without CVD.
 - n-3 fatty acids from plant sources may reduce mortality among persons with existing CVD
- **Nuts favorably impact lipids**

USDA Nutrition Evidence Library

	MUFAs Replace SFA	MUFAs Replace CHO	PUFAs Replace SFA
Total Cholesterol	↓ 6 – 10%	No change	↓ 8 – 12%
LDL Cholesterol	↓ 6 – 10%	↓	↓ 8 – 12%
HDL Cholesterol	No change	↑	↑ with omega-3 PUFAs ↓ with omega-6 PUFAs
Total:HDL Ratio	↓	↓	↓ (even with the ↓ on HDL from omega-6s)
Triglycerides	No change	↓	↓ with omega-3 PUFAs
Insulin Sensitivity	↑	↑	↑

Positive Messages

- Eat fatty fish at least twice weekly.
 - Toss tuna or salmon from a pouch onto a salad or mix with pasta
- Snack on a handful of nuts instead of sweets.
- Spread nut butter or mashed avocado on toast.
- Sauté thinly sliced garlic in oil over low heat until just golden. Remove the pan from the heat and toss with steamed vegetables.

Positive Messages

- When baking
 - Replace ¼ cup of butter with 3 tablespoons of olive or canola oil
 - Chocolate chip cookies: ½ butter, ½ canola oil
 - Replace butter with mashed avocado with 1:1 ratio
- Substitute all or half of the butter in your recipe with canola oil.
- Dip into hummus instead of blue cheese dressing.
- Spray oil onto oven-fried chicken for even coating.

Other Key Messages

- Single high saturated-fat meal may harm blood vessels¹
- Traces of trans fats add up
 - Avoid *partially* hydrogenated oils
- Eggs: 1 egg/day does increase lipids & CVD risk among pwd, type 2 but NOT among healthy populations²
- Red meat increases CVD risk³
 - SFA & cholesterol
 - Microbiota produce TMAO

¹J Am Coll Cardiol 2006 48:715-720 ²USDA Nutrition Evidence Library ³Nature Medicine 2003 9:576-585

Phytosterols

- NCEP: Consuming 2 g plant sterols/stanols lowers LDL-cholesterol by as much as 15%
- Average intake: 300 – 400 mg/d
 - Vegetable oils, nuts, seeds
- Consume with meals, 2 – 3 times per day

“Foods containing at least 0.5g per serving of plant sterols eaten with meals or snacks for a daily total intake of 2g as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease.”

Phytosterols

- Benecol and Take Control Spreads
- Minute Maid Heart Wise OJ
- Various milks and cheeses
- Benecol Smart Chews & Quest Cardio Chews
- VitaMuffin Dark Chocolate Pomegranate VitaTops
- Various breads, pasta, etc

My Diabetes Health Assessment

People living with type 2 diabetes are at an increased risk of developing cardiovascular disease (CVD), such as heart attack or stroke. In just a few minutes, you can learn your risk of having a heart attack or stroke in the next 10 years.

Based on your current numbers such as blood sugar, weight and blood pressure, you'll discover what you can do to reduce your risk of CVD. We'll provide you with personalized action plans to help you make lifestyle changes and lower your risk of CVD.

It only takes a few minutes to change your life.

Get Started Now!

http://www.heart.org/HEARTORG/Conditions/Diabetes/DiabetesToolsResources/My-Diabetes-Health-Assessment_UCM_313901_Article.jsp

Personalized Reports

MY DIABETES HEALTH ASSESSMENT
Action Plan - Reduce Blood Pressure

NAME: _____ DATE: _____

NOTE: Always consult with your healthcare provider about your goals and action plans.

Summary - Blood Pressure

Current Blood Pressure: **135 / 81 mm Hg**
 Recommendation: **Less than 130/80 mm Hg**
 (Note: Goal adjusted for diabetes or kidney disease)

My Goal: _____ / _____ mm Hg

Actions to Reduce Blood Pressure

High blood pressure puts an extra strain on your body - especially your heart, blood vessels and kidneys. It increases your risk of stroke, heart attack, kidney failure and heart failure.

When high blood pressure exists with obesity, smoking, high blood cholesterol levels or diabetes, the risk of heart attack or stroke increases several times.

You can help lower your blood pressure by:

- Losing weight
- Increasing physical activity
- Limiting your salt intake

Heart.org

National Diabetes Education Program

Diabetes and Heart Health

People with diabetes should be aware of their heart health. Having diabetes makes heart attack and stroke more likely—but it doesn't have to. Research has shown that people with diabetes can lower their risk for heart disease and other heart problems by managing the ABC's of diabetes—A1C, Blood Pressure, Cholesterol—and stopping smoking. NDEP provides educational resources for people with diabetes and health care professionals to raise awareness of the effect of diabetes on heart health.

Resources for Heart Health

- [Take Care of Your Heart, Manage Your Diabetes.](#)
- [You Are the Heart of Your Family...Take Care of It.](#)
- [4 Steps to Manage Your Diabetes for Life](#)
- [Diabetes and Your Heart infographic \(English and Spanish\)](#)

Ndep.nih.gov/resources

CMR Toolkit

Toolkit No. 10 Protect Your Heart: Plan and Cook Heart-Healthy Meals

You can protect your heart and blood vessels by making smart choices when you cook. Small changes can make a big difference in your health. See the sections below for tips on how to:

- plan heart-healthy meals and snacks
- cook heart-healthy meals

Place a check mark next to 2 or 3 things you're ready, willing, and able to try this week. Then use this list for more ideas later on.

For healthy recipes and food information, visit www.diabetes.org/MyFoodAdvice.

Plan heart-healthy meals and snacks

Choose lean meat, poultry, and fish.


- Check food labels and choose meats with 5 grams of fat or less in each serving.
- Choose lean cuts of beef such as round, sirloin, and flank steak; tenderloin, rib, and rump roast; T-bone, porterhouse, and cubed steak.
- Pick lean types of pork: ham, Canadian bacon, tenderloin, and loin chops.
- Buy sandwich meats with 3 grams of fat or less in each ounce.
- Other lean choices are leg of lamb, lamb chops, and roast lamb, and game, such as venison.

Choose heart-healthy foods to protect your heart and blood vessels.

- Buy lower-fat cheeses: cottage cheese, grand Parmesan, and any cheese with 3 grams of fat or less per ounce.


Choose whole-grain breads.

- Check the list of ingredients on foods made from grains. Choose foods that show "whole" or "whole grain" in the first ingredient. Whole-wheat flour, whole oats, oatmeal, whole-grain cornmeal, popcorn, whole-eye flour, barley, and bulgur are all whole grains.



Professional.diabetes.org

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Upcoming Books

The Overworked Person's guide to Better Nutrition

21 Things You Need To Know About Diabetes And Your Heart
