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HEART HEALTHY FOOD CHOICES IN THE ERA OF HAART: PART TWO

By Donna Tinnerello and Sharon Ann Meyer

Donna Tinnerello, MS, RD is an HIV specialist living in New York City. She works full time at Cabrini Medical Center, and is a consultant for A Better Place and Village Center for Care. Donna is a past chairperson of Nutritionists in AIDS Care (NIAC) and is on the board of directors of the AIDS Wasting Foundation. Contact Donna at <DTinnerello@aol.com>. Sharon Ann Meyer, AS, AA, DTR, Certified HIV Counselor is the President of HIV ReSources, Inc., and Editor-In-Chief of the HIV ReSource Review. Contact her at <sharon@hivresources.com>.

Part One of this article explored knowledge of the risk for cardiovascular disease (CVD) in people living with HIV infection (PLWHIV) on HAART. It also highlighted the research on food, nutrition and heart disease in the public. Part Two presents highlights from recent research of CVD causes and treatment and the results of a survey taken by nationwide HIV-savvy clinicians. The article also offers a preliminary set of nutrition guidelines for those on HAART.

Researchers continue to document new findings of heart disease causes and ways to treat them. For instance, high lipoprotein levels in HIV positive people using protease inhibitors (PIs) led some investigators to believe that HIV itself could increase the risk of cardiovascular disease. ⁽⁷³⁾ Other studies note an association between hypothyroidism and heart disease. According to experts, clinicians may wish to consider hypothyroidism in those with high cholesterol levels. When the thyroid gland produces too little hormone, metabolism can slow and affect the body's ability to clear cholesterol from the bloodstream. ⁽⁷⁴⁾ Researchers at Massachusetts General Hospital in Boston report that people who have hyperinsulinemia after fasting have an impaired ability to dissolve blood clots (fibrinolysis). ⁽⁷⁵⁾ This factor may explain why diabetics are at high risk for cardiovascular disease. Since new studies note the risk of sudden death is much higher in men with diabetes, it is even more important to detect and decrease risk factors early. ⁽⁷⁶⁾ It is also notable that

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ALTERNATIVE FOCUS: Therapeutic Marijuana

Numerous people believe the illegal status of marijuana jeopardizes the health of Americans by denying them access to a safe and effective medicine. An estimated 20 to 80 million Americans regularly smoke the herb. ⁽¹⁾ Too few consider both known and suspected risks of marijuana use. There is an enormous amount of science based information about this substance. We know it is widely used by certain patient groups despite the legal, social, and health problems associated with its use. ⁽¹⁻⁵⁾ Many people living with HIV or AIDS use it for a variety of reasons. ⁽³⁻⁶⁾ In one project, 71% of HIV-positive patients reported using marijuana. ⁽⁵⁾ Another study disclosed that patients used the substance as an adjunct to prescription medication treatments. ⁽⁴⁾

Reliable information on the potential risks and benefits of this controversial herb will help

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HEART HEALTHY FOOD CHOICES IN THE ERA OF HAART

TABLE 1. NATIONAL CHOLESTEROL EDUCATION PROGRAM DIETS

STEP 1 DIET
⇒ 8-10% of the day's total calories from saturated fat
⇒ 30% or less of the day's total calories from fat
⇒ Less than 300 mgs of dietary cholesterol a day
⇒ Limit sodium intake to 2,400 mgs a day
⇒ Sufficient calories to achieve or maintain a healthy weight and reduce blood cholesterol level
STEP 2 DIET
⇒ Less than 7% of the day's total calories from saturated fat
⇒ 30% or less of the day's total calories from fat
⇒ Less than 200 mg of dietary cholesterol a day
⇒ Limit sodium to 2,400 a day
⇒ Sufficient calories to achieve or maintain a healthy weight and reduce blood cholesterol level

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heart disease is the number one cause of mortality in women. ⁽⁷⁷⁾ The level of high density lipoprotein (HDL) is the most important consideration. Although the National Cholesterol Education Program (NCEP) guidelines define a HDL of less than 35mg/dl as a risk factor for CVD, this value is too low for women. ^(78, 79) Susan C. Stewart, M.D. stresses that women should make sure their HDL level stays above 45 mg/dl. ⁽⁷⁹⁾ It is notable that research documents the usefulness of a variety of dietary supplements for those on HAART with high cholesterol and high triglycerides (see Jan/Feb 1999 Review issue).

Jennifer Bowers, MS, RD, and colleagues at the Veterans Affairs Medical Center and the University of Arizona compared heart disease risk factors between an HIV-positive veteran group and the general US population. ⁽⁸⁰⁾ They found the Veterans Affairs HIV clinic population at higher risk for heart disease because of a high incidence of tobacco and alcohol use and a high dietary cholesterol consumption. On the other hand, their risk was lower because of a lower percentage of body fat and a low incidence of hypertension and diabetes. The patients are ultimately at an equivalent risk of CVD because of elevated lipid values, family history of heart disease, intake of total fat and saturated fat and low intake of vitamin E and dietary fiber.

TABLE 2. CHOLESTEROL CATEGORIES

LDL Cholesterol	
Less than 130 mg/dl	⇒ Desirable
130 to 159 mg/dl	⇒ Borderline-High Risk
160 mg/dl and above	⇒ High Risk
HDL Cholesterol	
45-50 mg/dl	⇒ Good for Men
50-60 mg/dl	⇒ Good for Women
Less than 35 mg/dl	⇒ Low HDL cholesterol - High Risk
70-80 mg/dl	⇒ Protective
Note: These categories apply to adults age 20 and above.	

ELEVATED BLOOD LIPID CONSIDERATIONS

The National Heart, Lung and Blood Institute and the National Institutes of Health initiated the NCEP in 1985. ^(81, 82) The program is based on scientific evidence that lowering blood cholesterol

reduces the risk of CVD. Efforts of the NCEP have led to improvements in attitudes, knowledge and practices regarding cholesterol and CVD that have resulted in the public's decreased intake of saturated and total fat. Americans blood cholesterol levels have dropped and CVD mortality continues to fall. Two diets are recommended for people with elevated cholesterol levels (Table 1). The Step 1 Diet is lower in fat and cholesterol than the usual American diet. It is recommended for everyone except children under 2 years of age who need more fat and calories to promote growth and development. Those already eating a Step 1 Diet who still need to lower their cholesterol should advance to the Step 2 Diet. Tables 2 and 3 (on page three) give desirable and pathological levels of total, low density lipoprotein (LDL) and HDL cholesterol used as indicators for initiation of Step 1 and Step 2 Diets.

Low fat diets for those with CVD and dietary changes for people with diabetes are commonplace. Although these diets have been judiciously used we continue to refine them as we document studies on their usefulness. After many years of research we have learned that the ratio of fats in the diet may be crucial for lowering elevated cholesterol. ⁽⁸³⁾ Recent studies suggest that, for most people with adult-onset diabetes a lower carbohydrate diet with more monounsaturated fat may be better <<http://www.women.com/bertolli/behlth04.htm>>. Very low fat diets may worsen the risk for heart disease, especially in people with hypertriglyceridemia or low HDL cholesterol levels and type 2 diabetes.

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SOY AND FIBER

The United Soybean Board provides numerous resources to tout the cholesterol-lowering properties of soy protein <<http://www.talksoy.com>>. Recent soy protein studies corroborate the potential importance of soy supplementation in reducing the risk of chronic disease in women. ^(84, 85) In nonhypercholesterolemic, nonhypertensive, and perimenopausal women, soy protein supplementation (20 grams of soy protein containing 34 mg of phytoestrogens) resulted in significant improvements in cardiovascular disease risk factors, menopausal symptoms, total cholesterol and LDL cholesterol levels. Soy protein containing isoflavones, which are phytoestrogens that have estrogen-like hormonal effects on the body, were needed to obtain the highly significant beneficial results. ⁽⁸⁵⁾ Higher amounts of soy isoflavones resulted in even lower cholesterol levels. ⁽⁸⁶⁾ Participants consuming a NCEP Step 1 Diet and isolated soy protein with 62 mg of isoflavones reduced total cholesterol by 4% and LDL cholesterol by 6%. Some investigators note the decrease in LDL cholesterol, that results from the consumption of soy-base texturized vegetable protein, occurs through a reduction in the absorption of cholesterol and perhaps bile acid. ⁽⁸⁷⁾ A concomitant reduction in HDL cholesterol and an increase in serum triglycerides (TG) occur as well. Australian investigators report further studies are needed to clarify the potential effect of isoflavones on HDL metabolism. ⁽⁸⁸⁾ Some studies suggest that the consumption of soy isoflavones may increase the risk of

Less than 200 mg/dl	⇒ Desirable
200 to 239 mg/dl	⇒ Borderline-High
240 mg/dl or greater	⇒ High

certain cancers. There may also be hazards in adding soy foods to the diets of post-menopausal women. Adding soy foods (25 grams soy protein) to the diet is preferred to taking soy supplements, which generally have higher levels of isoflavones. Some products such as soy protein concentrate powders have as much as 560 mg of isoflavones in a single serving.

Studies in The Netherlands tested the use of three different table spreads and found that a spread of free soyabean-oil sterols is effective in lowering both total and LDL cholesterol levels. ⁽⁸⁹⁾ Investigators at the Mayo Clinic in Minnesota report that margarine-like spreads containing stanol esters (such as Benecol® <<http://www.benecol.com/>> and Take Control™ <<http://www.takecontrol.com/>>) lowered total cholesterol and LDL cholesterol levels in mildly hypercholesterolemic people. ⁽⁹⁰⁾ Two studies indicate that in addition to lowering cholesterol, margarines that contain the phytosterols responsible for this therapeutic effect might also cause malabsorption of fat-soluble carotenoids. Gylling and colleagues compared the effect of standard rapeseed oil margarine versus a fortified margarine in 153 Finnish subjects. ⁽⁹¹⁾ Results of a yearlong study indicate that while the margarine reduced levels of total and LDL cholesterol, it also reduced beta-carotene levels by 25%. In another study that consisted of 24 women, the

same group found that beta-carotene was lowered by 30% in a six week study. ⁽⁹²⁾ Vitamin D, retinol and a-tocopherol levels were not affected.

Canadian researchers note an increased intake of soy protein and soluble fiber may improve blood lipids. ⁽⁹³⁾ Their 8-week randomized crossover trial included 20 hyperlipidemic men and postmenopausal women consuming the NCEP Step 2 Diet. The inclusion of foods high in soy, other vegetable proteins, and soluble fiber in addition to the Step 2 Diet resulted in further reducing serum lipid risk factors for CVD. Another study using hydroxypropylmethylcellulose* along with a NCEP Step 1 Diet significantly lowered total and LDL cholesterol. ⁽⁹⁴⁾

Recent studies indicate that psyllium* has a role in the management of hypercholesterolemia and high blood glucose. ⁽⁹⁵⁾ One study found that consuming 5.1 mg of psyllium twice daily along with a low fat diet in men with type 2 diabetes lowered LDL cholesterol by 8.9% and serum fasting glucose by 11.0% compared to placebo. Olson and colleagues conducted a meta-analysis to determine the role of psyllium enriched cereals in blood cholesterol levels. ⁽⁹⁶⁾ The research included more than 400 adults with mild to moderate hypercholesterolemia on low fat diets. Subjects who consumed a low fat diet and psyllium cereal such as All Bran® or Bran Buds®, had lower total cholesterol and LDL cholesterol. HDL cholesterol was unaffected in the psyllium group.

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It is notable that consumption of psyllium husk fiber bars helps those with diarrhea caused by anti-HIV PI combination therapy. ⁽⁹⁷⁾ Psyllium normally interferes with medications.

By speeding gastrointestinal transit time bulk laxatives like psyllium can lower the absorption of some drugs. Very little is known

"A number of foods high in MUFAs such as nuts, avocados, olives, and sesame seeds can be easily added to recipes."

however, about the effects of psyllium with common HIV medications. The liver's cytochrome P450 enzyme system* modifies other compounds in the body (refer to Nov/Dec 1998 Review issue). Jim Duke, Ph.D., notes, "There are close to 100 different types of detoxifying enzymes that regulate (induce or inhibit) cytochrome P450 and this is a brand new relatively unexplored field, very complex and disturbing. I predict that by the time we are through, we'll learn that all herbs and food plants contain P450 inducers and P450 inhibitors." ⁽⁹⁸⁾ Indications are to take psyllium at least one hour after taking drugs that it might chelate (see below). ^(98, 99) Psyllium is contraindicated in bowel, esophageal or GI obstruction and there are reports of allergic reactions, some of them fatal. ⁽⁹⁸⁾ It is contraindicated in diabetes that is difficult to control as it may reduce insulin needs in insulin dependent diabetes. People who use psyllium need to take at least five ounces of fluid per 5 grams psyllium to decrease the risk of esophageal obstruction, flatulence, and bowel obstruction. Bulking agents should not be taken when lying down or at

bedtime. Known drug interactions reported with psyllium include:

- ◆ Decreased absorption of calcium, magnesium, zinc, copper, vitamin B12
- ◆ Decreased insulin needs
- ◆ Decreased absorption of Digoxin/Cardiac glycosides, Coumarin derivatives, and Lithium salts
- ◆ Decreased absorption (rate/amount) of Carbamazepine

CVD DIETARY CONSIDERATIONS

Other new dietary considerations for people with CVD continue to be discovered. Both animal and human research have shown that orange juice impacts cardiovascular health. Researchers at the University of Western Ontario found that consuming three glasses of orange juice a day may help to increase HDL and decrease LDL cholesterol levels. ⁽¹⁰⁰⁾ Although TGs increased by 30%, they remained within the normal range. As noted in Part One of this article (see pages 14 to 15 in Jan/Feb 2000 Review issue), research shows that the kind of fat consumed may make a significant difference in the risk of CVD. Consumption of trans fatty acids found in many processed foods contributes to increased blood LDL cholesterol levels and increases the risk of CVD. The FDA recently proposed new rules that would affect labeling of trans fatty acids. ⁽¹⁰¹⁾ They want to require that the amount of trans fatty acids in a food be included in the Nutrition Facts panel. Included

in this proposal is a limit on trans fatty acids wherever there are limits on saturated fat in nutrient content claims or health claims. The majority of trans fats come from processed foods. Food sources include fried fast foods, some margarines, commercial snacks such as chips and cookies and shortenings. Visit <http://vm.cfsan.fda.gov/~lrd/hhtfacid.html> for more information on trans fat and labeling.

Studies suggest a protective effect of omega-3* polyunsaturated fatty acids (PUFA). Daily supplementation with 1 gram of omega-3 fatty acids every day appears to reduce the chances that heart attack patients will suffer a cardiovascular death. ⁽¹⁰²⁾ Recent clinical studies suggest that increasing the percentage of monounsaturated fatty acids (MUFA), without changing total fat intake, may be the most effective approach to improve one's cardiovascular profile. ^(103, 104) Clinical nutritionists from The Pennsylvania State University and University of Rochester Medical Center report that this dietary change may be more effective than following the Step 2 Diet. While the Step 2 Diet raised triglyceride levels and lipoprotein(a) and lowered levels of HDL cholesterol, the high MUFA diet reduced triglyceride levels without significantly lowering HDL cholesterol or raising lipoprotein (a). Dr. Elaine B. Feldman thinks that the antioxidant, antithrombotic, and antihypertensive properties of MUFAs may help to reduce the risk of CVD. ⁽¹⁰⁵⁾ A number of foods high in MUFAs such as nuts, avocados, olives, and sesame seeds can be easily added to recipes.

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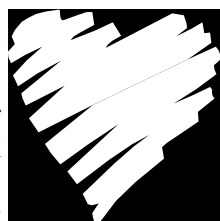
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Researchers readily admit that data on the usefulness of dietary treatment for hyperlipidemia in PLWHIV is scarce. Australians Manjka Batterham and colleagues from the Department of Nutrition and Dietetics at Royal Prince Alfred Hospital, created a questionnaire to evaluate the effect of dietary fat intake on total cholesterol, serum TG levels, and lipodystrophy in patients on HAART. ⁽¹⁰⁶⁾ Seventy-nine patients (68 on HAART and 11 not on HAART) filled out the self-administered questionnaire. Researchers found no correlation between dietary fat intake, total cholesterol and TG; however, they did find higher total and saturated fat levels in the diets of patients with lipodystrophy. Batterham and colleagues feel that more evidence is needed before restricting fat intake in HIV positive patients with elevated serum lipids. This study had a small number of subjects and it is important to remember that diet recall is often weak because of a number of factors. One study using a low fat diet coupled with exercise did find that this type of intervention plays an important role in the control of hypertriglyceridemia in HIV-positive people. ⁽¹⁰⁷⁾ Data from 57 men and 29 women on PIs showed a decrease in both serum TG and cholesterol levels.

HYPERTRIGLYCERIDEMIA

Animal studies have led some investigators to suggest that the loss of chromium is accelerated in people who eat diets high in simple sugars, increasing the possibility of an overproduction of insulin in response to glucose. ⁽¹⁰⁸⁾ Human studies

continue to note the effect of diet in people with high TGs and diabetes. The occurrence of hypertriglyceridemia is increased in people with advanced HIV disease and in HIV-positive people on PIs. ⁽¹⁰⁹⁾ Recent studies highlight the detrimental effects of high carbohydrate diets on TG levels. A small randomized study of eight healthy, non-diabetic volunteers suggested that a high-carbohydrate diet (60% carbohydrate, 25% fat and 15% protein) elevates both fasting and postprandial TG concentrations. ⁽¹¹⁰⁾ This is of importance for those living with HIV or AIDS on HAART who have increased their portion of carbohydrates, particularly for those living with lipodystrophy. The American Diabetes Association recommends aggressive therapy directed toward raising HDL and lowering LDL cholesterol levels along with impacting hypertriglyceridemia. ⁽¹¹¹⁾



Although *Nutrition Recommendations and Principles for People With Diabetes Mellitus* <[http://journal.diabetes.org/Full Text/Supplements/DiabetesCare/Supplement100/s43.htm](http://journal.diabetes.org/Full_Text/Supplements/DiabetesCare/Supplement100/s43.htm)> helps many HIV-negative people to improve their risk of CVD, documentation of dietary measures for HIV-positive diabetics are lacking. To date, there are no published studies on diet and HIV-related lipodystrophy. Some of the data presented at the Third International Conference on Nutrition and HIV Infection, however, lend credence to the belief that healthy food choices might help to make a positive difference in the incidence of

CVD. Demagistris and colleagues from Italy remind us that increased serum TGs lead to pancreatitis and cardiovascular complications. They state that nutritional counseling and support by trained nutritionists is effective in reducing TG levels and indicated for HIV-positive people on PIs, particularly those with high TG levels. ⁽¹¹²⁾ Their study consisted of 74 outpatients, 23 who had pre-treatment high TG, and 51 had normal levels prior to PI treatment. While on PI therapy, 50 patients presented with high TG. The number of patients treated with diet was small, 5 patients in all- 3 treated with diet only and 2 with diet and gemfibrozil* - each with the desired response e.g., a fall in serum TG. None of the patients with persistent high TG had a drop in levels without nutrition intervention. French investigators were also successful in lowering high serum TG by nutrition counseling in HIV infected patients at high risk for pancreatitis. ⁽¹¹³⁾ All but one of the patients was on PI triple combinations. Six months of diets low in fats and sugars lowered TG levels below the 10 mmol/l threshold for increased pancreatitis risk.

MORE RESEARCH IS NEEDED

It is apparent that more research is needed on the effect of diet and heart disease risk factors in PLWHIV. In the meantime, we have surveyed HIV-savvy dietitians within the U.S. and Canada to see how they are responding to their patients need for protection from the risk factors for CVD. Since the beginning of this era of lipodystrophy and HAART, questions regarding the prevalence of

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the disorder have always eluded investigators. The reason most likely remains the disparity of symptoms that exists or does not exist in patients with the syndrome. To get a handle on two of the features; hyperlipidemia and diabetes, we asked our national panel of dietitians how many HIV-challenged people they see in their practices with abnormal lipid levels and the numbers they see with new onset diabetes while on HAART (Table 4).⁽¹¹⁴⁻¹¹⁹⁾

Clearly, race and geographic location make a difference in the incidence of CVD and diabetes within the HIV population. Ellyn Silverman, MPH, RD, CHES, president and owner of ECS Nutrition in Long Beach, California sees patients in several different settings and believes that her diabetes population is higher because many of her patients are African American and Hispanic.⁽¹¹⁵⁾ Registered Dietitian Carla Heiser of Chicago, Illinois reports many HIV-positive people with elevated lipids and a lower incidence of diabetes, but questions the prevalence of insulin resistance and carbohydrate intolerance that is not routinely measured.⁽¹¹⁷⁾ Ellen Engelson, Ed.D., a co-investigator with Dr. Kotler at St Luke's Roosevelt Hospital Center in New York City suggests that

"Some dietitians modify dietary fat with specific recommendations on the type of fat to eat."

PLWHIV be monitored closely using fasting glucose and lipid profiles periodically including before starting a new antiretroviral* regimen to obtain a baseline. All RDs interviewed with access to lab data routinely monitored lipid levels.

DIETARY CONSIDERATIONS

The point at which dietitians intervene with lipid lowering strategies is variable. In New York City at the Chelsea Clinic affiliate of New York Hospital Gina Chan, RD, usually starts nutrition counseling and interventions when total cholesterol exceeds 220 mg/dl and serum TGs exceed 250 mg/dl. Heiser sets her sights on >200 mg/dl cholesterol, >200 mg/dl serum TG, >130 mg/dl LDL and <35 mg/dl HDL.⁽¹¹⁷⁾ Diana Peabody, RDN, at the Oak Tree Clinic in Vancouver, British Columbia, Canada along with Sonia Grant and Owen Wightman at New York's God's Love, We Deliver intervene as soon as they have knowledge that an elevation in lipids exists.^(118, 120) Like other RDs, Rachel Stern at the New Jersey Community Research Initiative In Newark, NJ is much more conservative.⁽¹²¹⁾ Rachel considers interventions when cholesterol is between 200- 240 mg/dl. She suggests a more complete

profile and retesting and takes into consideration co-existing CVD risk, particularly family history, age, weight, and smoking. Rachel does counseling to lower lipid levels when cholesterol is above 250 mg/dl. For elevated TG, she intervenes with dietary measures at about 500 mg/dl. While well aware that this is way above the norm, she is not convinced of the harmfulness of hypertriglyceridemia at that level in her patient population. She is more careful for her patients with a history of pancreatitis.

Although there are no current HIV-specific guidelines for clinicians to follow, an expert panel is working on National HIV Nutrition Guidelines including principles for managing nutrition concerns such as hypertriglyceridemia and high cholesterol levels. Numerous nutrition professionals use the NCEP guidelines as a teaching tool to help their patients with elevated blood lipids. Meridith Liss, RD, at New York Hospital routinely uses the guidelines when counseling patients.⁽¹²²⁾ Mary Romeyn, MD, an HIV specialist in San Francisco California, along with Silverman and Chan are also advocates of the NCEP guidelines for managing lipid disorders.^(115, 116, 119) Stern encourages less fat, less fried and "junk" foods.⁽¹²¹⁾ She would love to recommend extra virgin olive oil and cold pressed walnut oil, along with butter or trans-free fat tub margarine instead of stick margarine, but unfortunately the people she counsels are abjectly poor. Their food comes from food banks and soup kitchens, or they rely on the lowest price brands at the store. In an

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Clinician	Location	Patients with ↑ Cholesterol	Patients with Diabetes
Ellyn Silverman, RD	California	70-80%	15-20%
Gina Chan, RD	New York	25-35%	5-10%
Mary Romeyn, MD	California	>40%	<5%
Charlie Smigelski, RD	Boston	40%	5%



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ideal setting, Stern would aim for moderate fat, not low fat, especially in this patient population.

Some dietitians modify dietary fat with specific recommendations on the type of fat to eat. Charlie Smigelski, RD, at Fenway Community Health Center in Boston states he is much more aggressive than any existing protocols. ⁽¹¹⁴⁾ He recommends 25-35% of calories from olive oil, raw nuts and seeds, primrose oil with essential fatty acid omega-6* supplements, and fish oils. Rosa Donohue, RD, a dietitian at Iris House in New York City recommends increased MUFA, preferably cold-pressed canola and extra-virgin olive oil and omega-3 fatty acids in the form of flax seed oil, along with fewer saturated, polyunsaturated and trans fats. ⁽¹²³⁾ Lisa Roth, another Registered Dietitian in New York, recommends both polyunsaturated fat and MUFA. ⁽¹²⁴⁾ Peabody suggests a modest reduction in fat if intake is usually high. She aims for 30% of calories from fat, but adjusts this percentage depending on other risk factors such as wasting and obesity. ⁽¹¹⁸⁾ Heiser believes that long chain saturated fatty acids should be avoided and dietary fats should be balanced. ⁽¹¹⁷⁾ Long chain saturated fats (fatty meat, poultry skin, lard, and shortening fats found in processed meat products) are associated with elevated cholesterol and LDL cholesterol. Hydrogenated and trans fats (margarines, hydrogenated oils, fats found in baked products,

processed and commercially fried foods) are also shown to be atherogenic. Heiser mitigates total fat intake, especially animal fats as a main strategy for combating high blood fat levels.



"Americans typically consume too much nonessential omega-6 (corn, safflower and sunflower oils) and too little omega-3 rich food sources..."

in addition, short chain length saturated fats, and fats that are rich in MUFA and omega-3 fatty acids play a role in maintaining cell membranes. The body is more efficient with metabolizing these fats. Butter, egg yolk, dairy and coconut contain short and medium chain length fatty acids as well as MUFA. These fatty acids are generally not involved in elevating serum cholesterol and triglyceride levels. Therefore, incorporating these foods within the context of a nutritious diet adds variety and often times necessary calories. Like Smigelski, Heiser recommends higher fat intake depending on energy balance and current intake and agrees that omega-

3 and MUFA containing fat sources should be emphasized. Again, recommendations for an individual's eating plan are based on diet patterns and other risks for heart disease. For an interesting article on stearic acid -- the saturated fat in beef and chocolate -- visit <<http://www.hhdev.psu.edu/research/Stearic.htm>>.

CARBOHYDRATE MODIFICATION

There are several studies linking non-whole grains to increased risk for diabetes in older people, especially women. ⁽¹¹⁴⁾ Numerous RDs suggest the modification of carbohydrates for management of blood lipids. They recommend more complex carbohydrate, whole grains, high fiber foods and fewer refined and simple carbohydrates. ^(114, 115, 118) Donohue suggests high fiber carbohydrate as well with an emphasis on oat bran and soy products. ⁽¹²³⁾ Two to three servings of soy protein per day may help to improve blood lipid levels. Heiser however, recommends fewer carbohydrates in general and gives some credence to the glycemic index (GI) introduced in 1984. ^(117, 125) She likes to work closely with clients to check their individual response to carbohydrate containing meals. Some diabetes experts feel that while the GI is interesting, too many factors affect the GI of foods to make it a practical tool in meal planning. Smigelski takes into consideration the GI for fruits and pushes legumes, a low price food. ⁽¹¹⁴⁾ Stern is another advocate of beans because they are widely used, economical and accepted in her population. ⁽¹²¹⁾ She modifies carbohydrates for hypertriglyceridemia

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Glycemic Index - Key Points

The glycemic index ranks foods on how they affect blood sugar levels two to three hours after ingestion. The index targets only carbohydrates since fat and protein cause minimal blood sugar elevations. It works by comparing the rise in blood sugar after the ingestion of a certain carbohydrate food to the reactivity of serum levels to white bread or pure exogenous glucose, that reference number being 100. Results suggest that the rate of digestion, absorption and metabolism of food are as important as the amount consumed.

- ◆ Ripeness of fruit affects the response e.g., a ripe banana will raise blood sugar higher than one that is green or in an earlier stage of ripeness. In addition, the form, e.g., mashing the banana versus eating it whole has the potential of changing the glycemic index.
- ◆ Fat mixed with a carbohydrate lowers the glycemic response e.g., ice cream has a lower glycemic index than bread; potato chips rank lower than baked potatoes.
- ◆ Legumes have a flat glycemic response and even flatten the response to the subsequent meal after their ingestion.
- ◆ The level of processing affects the response e.g., refined grains are higher in glycemic index.
- ◆ The type of monosaccharide affects the response e.g., fructose has a lower glycemic index than glucose.
- ◆ Some diabetes experts feel that while the glycemic index is interesting, too many factors affect the glycemic index of foods to make it a practical tool in meal planning.

The highly structured ADA Exchange Lists Diet provides guidelines for meal timing and composition for glycemic and lipid control with an emphasis on low fat foods. Less structured, simpler approaches such as Dietary Guidelines for Healthy Americans, a general diet appropriate for the diabetic but not portion controlled, and the Food Guide Pyramid, summarize nutrient needs for healthy Americans. ^(127, 128)

Changes to increase the emphasis on plant foods and whole grains and to define optimal fatty acid composition, including ratios of omega-6 and omega-3 are expected for the Dietary Guidelines for Healthy Americans. ⁽¹²⁹⁾ The Diabetes Food Guide Pyramid is more specific for diabetics. ⁽¹³⁰⁾ All three resources can and should be used by diabetics to ensure healthy food choices. Nutrition recommendations and principles for diabetics have been published. ⁽¹³¹⁾

Some nutrition professionals use the ADA Medical Nutrition Therapy (MNT) Protocols as a guide when treating diabetics while others do not. ⁽¹³¹⁾

Silverman uses a modified American Diabetes Association diet without the exchanges. ⁽¹¹⁵⁾ Stern thinks the diet is too low in fat for her patients who tend to be underweight with poorly controlled diabetes. ⁽¹²¹⁾ She contends that the exchange lists are too complicated for poor readers. A few years ago the American Diabetes Association did come out with some simple to read education materials that work for her patients. Chan does not recommend the American Diabetes Association diet and her recommendations for diabetes are sometimes different from those

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and hyperlipidemia especially if people are overweight. Stern has found a surprising number of people with an "addiction like" pattern for colas and coffee with sugar. Kool-Aid and related sugary drinks in excess of 50 to 60 ounces a day are commonly consumed in her population. She counsels against a high intake of so-called "healthful juices" e.g., orange juice because of the high sugar content. She does recommend sugars, but in the form of whole fruits and complex carbohydrates.

Management of people with diabetes presents additional recommendations to help control glucose levels. The most widely used and publicized means of calculating a diabetic diet and meal planning was published in 1950 as a joint effort of the American Diabetes Association, the U.S. Public Health Service and the American Dietetic Association (ADA). ⁽¹²⁶⁾ Foods were organized into six groups or "exchanges" on the basis of their protein, fat and carbohydrate content. The guidelines have gone through a series of updates to include reductions in fat, cholesterol and sodium, as well as increases in dietary fiber.



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for cardiac. ⁽¹¹⁶⁾ She takes into consideration body weight, glucose control and lifestyle. For his diabetic patients, Smigelski recommends 45-55% complex carbohydrates, 20-25% fat and 15% protein, but he also adds supplements like chromium (see Jan/ Feb 1999 Review issue for more information on chromium) and alpha lipoic acid that he would not suggest for dyslipidemia*. ⁽¹¹⁴⁾ Peabody places more of an emphasis on meal planning and portion control with her diabetics than she does with cardiac patients. ⁽¹¹⁸⁾ Both Donohue and Heiser decrease the carbohydrates for diabetes as opposed to cardiac patients. ^(117, 123) For her diabetics, Heiser limits simple sugar intake, emphasizes complex, high fiber carbohydrates, high quality lean protein foods and balancing dietary fat sources. ⁽¹¹⁷⁾ She works with clients to identify food sources of sugar containing foods, and beverages and emphasizes increased intake of high fiber containing carbohydrates, rich in chromium and magnesium. Balancing meals and snacks are another dietary strategy that is useful. Mary Romeyn is very liberal with her HIV diabetic patients and believes in a no concentrated sweets diet unless they have high cholesterol. ⁽¹¹⁹⁾

The consumption of fruit and vegetables increases antioxidant and phytochemical* intake. Phytochemicals also found in legumes, whole grains, nuts, seeds, soy, herbs and spices aid in the prevention of CVD and diabetes. Recommendations for fruit and vegetable consumption varies widely. Some RDs note that getting patients to put even small amounts of

these foods in the diet is often difficult. ^(114-116, 118, 119, 121, 123) Donohue suggests commonly consumed fruits and vegetables along with foods not normally eaten (bitter melon, dandelion greens and roots, tangerine and grapefruit rind, rice bran and shitake mushrooms) to help lower blood sugar. ⁽¹²³⁾ Silverman is likely to recommend more vegetables than fruit if serum TG is elevated, but tries to encourage 5-9 servings of fruits and vegetables every day. ⁽¹¹⁵⁾ Peabody recommends more if possible but adds that for some of her patients with limited resources consuming one fruit and one vegetable every day is a challenge. ⁽¹¹⁸⁾ Chan also notes she usually has to settle for patients eating 1- 2 servings of fruit and vegetables while Smigelski suggests at least 7 servings/day. ^(114, 116)

Many people benefit by learning how to shop for food on a limited budget.

PLWHIV benefit from knowing about healthy low-cost foods and where to buy food at a lower cost. Information on comparing cost and food nutrient value is also very helpful. RDs educate patients with financial constraints about free or low-cost community food resources and how to access them. Smigelski's center has a food bank where his patients can get decent vegetables and fruits. ⁽¹¹⁴⁾ He recommends chicken, legumes/beans and vegetables as main meals. Chan suggests any kind of vegetables, whole wheat bread if it is the same price as white, and more chicken and canned tuna along with less red meat and fast food. ⁽¹¹⁶⁾ As a cost effective measure and good nutrient base, Silverman recommends canned or frozen fruits and vegetables while Stern recommends bananas, carrots and greens year round and seasonal fruits and vegetables. ^(115, 121) Stern

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Current MNT Dietary Recommendations For Diabetes Mellitus

Protein- 10-20% of calories (derived from both animal and vegetable sources)

Key Points:

- ⇒ Lower protein may delay the progression of diabetic renal disease.
- ⇒ 80-90% of calories should be distributed between fat and carbohydrate. Distribution is contingent on assessment and individual treatment goals.

Fat- Follow NCEP recommendations

Key Points:

- ⇒ TG levels may force restrictions on fat.
- ⇒ Use of omega 3 fatty acids should be emphasized. PUFA of the omega-3 series, found naturally in fish and other seafood is encouraged.
- ⇒ If LDL cholesterol is the primary concern, or if levels are elevated, further reduction of saturated fat to NCEP Step 2 diet is recommended.
- ⇒ Individuals with TG levels >1,000 mg/dl require reduction of all types of fat to <10% of calories in addition to pharmacological interventions to reduce the risk for pancreatitis.

Carbohydrate- The balance of calories comes from carbohydrates with 20 to 35 grams of dietary fiber.



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TABLE 5. COMMON FOODS USED TO HELP LOWER LIPID LEVELS

Beans/Legumes	Canned tuna in water	Cranberry	Flaxseed
Garlic & Ginger	Grains	Ginkgo biloba	Hawthorn
Isolated soy protein	Lake trout	Leafy greens	Lemon
Mackerel & Sardines	Meat analog	Metamucil	Milk Thistle
Mixed Nuts & Seeds	Oat bran & Oatmeal	Olives	Onion
Mushrooms	Soy, olive and canola oil	Salmon	Soy beans
Soy milk	Tofu	Walnuts	Whey protein

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notes tomato sauce at shelters and soup kitchens is a big contributor to vegetable intake for some people and she tells her patients to use catsup as well. ⁽¹²¹⁾ *Fiber-Rich Fruits and Vegetables: a "Best Buys" Guide* <http://www.oznet.ksu.edu/ext_F&N/_Timely/Fibtbl.htm> may be helpful for those with limited food budgets.

Most HIV-savvy nutrition professionals recommend the use of antioxidants in the management of HIV and lipodystrophy, which includes heart disease (see handout in the Jan/Feb 1999 Review issue). Silverman agrees that antioxidants do have a role in the management of cardiac disease and supplements her cardiac patients with vitamin E at 400-800 IU/day. ⁽¹¹⁵⁾ Smigelski is very pro antioxidants for HIV-positive people in general and most definitely in those at risk for heart disease. ⁽¹¹⁴⁾

Other strategies for managing lipid elevations and diabetes in HIV patients using foods were voiced by several RDs. Numerous foods found in nature are said to help decrease the risk of cardiovascular disease (Table 5). In addition to many of the foods listed in Table 5, Donohue recommends eggplant, fenugreek seeds, dandelion and burdock root, sage, gugulipid, sardines and other fish. ⁽¹²³⁾ Peabody also recommends fish and flax oil in addition to lots of

vegetables high in carotenoids. ⁽¹¹⁸⁾ Smigelski suggests raw nuts and seeds in addition to ground flaxseeds, apples, pears and bananas. ⁽¹¹⁴⁾

Over the past few months we have explored the phenomenon of lipodystrophy, most importantly the risk for heart disease and premature diabetes mellitus (an independent CVD risk factor) in our PLWHIV on successful HAART. Due to the data from Framingham, the Seven Countries, and other large nutrition intervention trials we have learned that diet is truly the cornerstone of therapy for millions of Americans at risk for heart disease. These studies have taken morbidity and mortality from CVD out of the realm of inevitable genetic circumstance. Instead we have learned that informed proactive Americans who exercise, stop smoking and consume a diet rich in whole grains, vegetables and fruits and low in saturated fat can live a long healthy life in spite of genetics.

Although we don't have a lot of hard data on diet and HIV-positive people with these risk factors, most of us know that not considering diet changes would be unethical given the circumstance, the history and our education (see Jan/Feb 2000 Review issue). Most of the HIV-savvy nutritionists surveyed are meeting the challenge head on with aggressive diabetes management and cholesterol lowering techniques. Some follow tradition, while others have experimented and rewritten historical guidelines. Each clinician has the goal of continuing to provide individualized long term, life giving nutritional care to HIV-positive people in the best possible manner.

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MNT Goals For Diabetic Patients

1. Maintenance of near normal glucose levels by balancing food intake, medications, and activity levels. Medications used are insulin (either exogenous or endogenous) and oral hypoglycemic agents.
2. Achievement of optimal lipid levels
3. Provision of adequate calories for maintaining or attaining reasonable weights for adults, normal growth and development rates for children and adolescents, and meeting increased metabolic needs for pregnancy and lactation or recovery from catabolic illness
4. Preventing, delaying or treating nutrition-related risk factors and complications
5. Improving overall health through optimal nutrition



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Medicine, 1921

Heart disease becomes the leading cause of death in America after 10 years of jockeying for the lead with tuberculosis. Coronary disease accounts for 14 percent of U.S. deaths and the figure will increase to 39 percent in the next 50 years. ¹

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