Diabetes: Overview and Risk Factors

America is experiencing a diabetes epidemic. Over the past 20 years, the number of adults diagnosed with diabetes has more than doubled. Diabetes has rapidly emerged as a leading contributor to the epidemic of heart disease that is sweeping the country, and is a leading cause of amputation and blindness among adults. For children, the situation is even more serious, with some projections predicting that one in three children under the age of 10 today will be diabetic by the age of 18.

The consequences of uncontrolled diabetes are severe: blindness, kidney failure, increased risk of heart disease, and painful peripheral nerve damage. Today, many practitioners focus treatment almost entirely on strict blood sugar control.

While diabetes is characterized by excess blood glucose, this oversimplified approach can inadvertently hasten the progression of type 2 diabetes (the most common form) while accomplishing little in the way of offsetting its debilitating symptoms. A superior strategy would be more diversified; concurrently implementing methods intended not only to control blood sugar but also to increase insulin sensitivity in patients, as well as work to offset damage inflicted at the cellular level, would very likely go further in terms of improving and prolonging overall quality of life.

One example of this cellular damage central to the deterioration associated with diabetes is oxidative stress. Diabetics typically suffer from high levels of free radicals that damage arteries throughout the body, from the eyes to the heart. Consequently, it is important that diabetics understand their need for antioxidant therapy to help reduce oxidative stress and lower the risk of diabetes-related complications.

<table>
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<tr>
<th>Risk Factors for Diabetes</th>
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<tr>
<td>Age greater than 45 years</td>
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<td>Excess body weight (especially around the waist)</td>
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<td>HDL cholesterol under 35 mg/dL</td>
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<td>High blood levels of triglycerides (250 mg/dL or more)</td>
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<td>High blood pressure (greater than or equal to 140/90 mmHg)</td>
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<tr>
<td>Poor diet containing large quantities of sugar</td>
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<td>Low activity level (exercising less than three times per week)</td>
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<td>Metabolic syndrome: a pre-diabetic constellation of symptoms.</td>
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<tr>
<td>Genetic factors: family history of diabetes, gene variations: ACE, CRP, IL6, LIPC, PON1, PPARG, TNFA, VDR (see Gene SNP™ Health Practitioners Guide)</td>
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<tr>
<td>Other causes: Persons from certain ethnic groups, including African Americans, Hispanic Americans, Asian Americans, and Native Americans, have a higher risk for diabetes.</td>
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Everyone over age 45 should have a blood sugar (glucose) test at a minimum of every three years, with annual testing being ideal. For those at a higher risk for diabetes, regular testing of blood sugar levels should begin at a younger age.

Type I diabetics will essentially rely on insulin therapy to provide the foundation for their continued health. The supplements referenced in this protocol, however, may help offset some of the complications caused by diabetes (e.g., reduced antioxidant capacity and glycation) as well as enhance their ability to effectively metabolize glucose.

Type II diabetics, by contrast, can exert a profound effect on the progression of their disease by improving insulin
sensitivity, enhancing glucose metabolism, and attempting to mitigate the complications of diabetes with a variety of dietary and lifestyle modifications.

**Nutraceutical Support for Diabetes Protocol**

*Note:* While dietary supplements are generally very safe and beneficial, patients should follow a few precautions. If they are pregnant, breastfeeding or taking prescription drugs, please counsel the client on the effects that supplement may have on their health. Ensure that the patient follows the label instructions on the bottle regarding dosage, and use caution if prescribing a different dosage.

<table>
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<tr>
<th>Recommended Supplement</th>
<th>Purpose</th>
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<tr>
<td>1 Chromium supplement; glucomannan supplement</td>
<td>To help maintain normal blood sugar levels, reduce sugar cravings, promote the normal release and activity of insulin, promote cellular health in peripheral nerves and the cardiovascular system, support a strong immune system and help maintain normal cholesterol and triglyceride levels. Intended for pre-diabetic conditions only.</td>
</tr>
<tr>
<td>2 Coenzyme Q10 supplement</td>
<td>To help maintain healthy blood sugar levels, support insulin activity, help to maintain cardiovascular health, help with energy and stamina, promote muscle health and strength, and help in weight management.</td>
</tr>
<tr>
<td>3 Antioxidant formula</td>
<td>To support healthy blood glucose levels, combat free radicals, help maintain healthy cholesterol levels, help maintain healthy circulation by strengthening capillaries, arteries and veins, promote healthy nitric oxide levels, and support healthy platelet activity.</td>
</tr>
<tr>
<td>4 B vitamins, preferably in active form</td>
<td>May help protect telomeres, markers of DNA stability. To promote cardiovascular health and healthy levels of homocysteine.</td>
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<tr>
<td>5 Omega III; fish oil</td>
<td>To promote overall cardiovascular health.</td>
</tr>
<tr>
<td>6 Fiber and L-glutamine formula</td>
<td>To support overall health by helping to maintain normal cholesterol levels, helping to maintain normal blood glucose levels and promoting immune health, as well as colon health and healthy growth of beneficial bacteria in the colon.</td>
</tr>
</tbody>
</table>

**Micronutrient Description and Extrapolation**

*Note:* Hypoglycemic agents will not work for patients with type 1 diabetes, or patients with type 2 diabetes who have lost their ability to produce insulin altogether.

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<tr>
<th>Micronutrient</th>
<th>Description</th>
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<tr>
<td>Chromium, Chromium Picolinate, Chromium Arginate</td>
<td>Promotes normal glucose metabolism, helps maintain healthy insulin levels, and helps maintain healthy blood levels of cholesterol and other fats.</td>
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<tr>
<td>Glucomannan</td>
<td>Helps maintain healthy blood sugar levels, delays stomach emptying and promotes gradual absorption of blood sugar.</td>
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<tr>
<td>Gymnema sylvestre</td>
<td>Supports normal glucose absorption and reduces sugar cravings.</td>
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<tr>
<td>Ginseng</td>
<td>Maintains cardiovascular health and aids the body in directly dealing with the effects of mental and physical stress.</td>
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<tr>
<td>Vanadium</td>
<td>Maintains healthy blood glucose levels, supports normal blood flow and maintains normal glycogen synthesis and storage.</td>
</tr>
<tr>
<td>Coenzyme Q10</td>
<td>Generates energy from oxygen in the form of ATP. Displays antioxidant properties.</td>
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<tr>
<td>L-Carnitine</td>
<td>Supports fat metabolism in the heart, organs and tissue, and transports fatty acids into the mitochondria of the cell, resulting in additional formation of adenosine triphosphate (ATP).</td>
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<tr>
<td>Pine Bark Extract</td>
<td>Displays powerful antioxidant properties, promotes normal production of endothelial nitric oxide, promotes the normal dilation of blood vessels, supports healthy blood glucose levels and maintains healthy cholesterol levels.</td>
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<tr>
<td>Bilberry Extract</td>
<td>Displays antioxidant properties and supports healthy vision and venous circulation.</td>
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<tr>
<td>Grape Seed Extract</td>
<td>High content of oligomeric proanthocyanidins (OPCs). Maintains healthy cholesterol levels.</td>
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<tr>
<td>Niacin (Vitamin B3)</td>
<td>Supports the proper functioning of the digestive system, skin and nerves. Mitigates metabolizing of carbohydrates.</td>
</tr>
<tr>
<td>Niacinamide</td>
<td>Supports the proper functioning of the digestive system, skin and nerves. Mitigates metabolizing of carbohydrates.</td>
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<tr>
<td>Biotin (Vitamin B7)</td>
<td>Maintains steady blood sugar levels, supports the citric acid cycle used during exercise, supports healthy cell growth and helps maintain normal cholesterol levels.</td>
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**Dietary Recommendations**

**Macronutrients**
- Strictly limit total carbohydrate intake: 150-175 grams daily is a suitable baseline, with adjustments made in accordance with observed blood glucose excursions.
- Avoid, or very strictly monitor, all forms of sugar as well as rice, pasta, noodles, bread, cereals, fruit juices, milk, yogurt, common snack foods, desserts and sodas.
- Maintain ample fiber intake with meals: 25-35 grams daily is recommended.
- There is no limit on intake of vegetables and/or green salads — these foods are filling, nutritious, and raise blood glucose minimally.
- There is no strict limit on protein; consistent with appropriate caloric intake, moderate amounts of low-fat protein have minimal impact on blood glucose and help substantially to control hunger.
- There is no strict limit on fat; consistent with appropriate caloric intake, moderate amounts also work to reduce appetite with minimal impact on blood glucose. Non-saturated fats are highly preferred.
- Many commercially produced condiments and dressings contain some form of sugar; patients must be alerted to this and make choices accordingly.

**General Eating Practices**
- Skipping meals must be avoided and meals or snacks should be distributed evenly, at 3- to 4-hour intervals.
- Three meals a day, plus snacking as needed, is the recommended approach.
- Alcohol intake is discouraged; one or two servings weekly is considered acceptable.

**Lifestyle Recommendations**
- All diabetics must begin and maintain a consistent exercise program for successful diabetes management.
- All diabetics should engage in physical exercise a minimum of four days per week — daily activity is ideal.
- Two to three sessions per week of low-impact, moderate intensity cardiovascular exercise — walking, biking, rowing — is recommended.
- Two to three sessions per week of moderate resistance exercise — free weights, machines, bands — using higher repetitions (12–15) is recommended.
- Ideally, both types of exercise, cardiovascular and resistance, should be used in appropriate combination and balance.
Monitoring Patients at Risk for Diabetes

Baseline measurements consist of evaluating both personal and family history of obesity, diabetes, dyslipidemia, hypertension or cardiovascular disease, BMI and waist/hip circumference measurement, as well as blood pressure, fasting plasma glucose and fasting lipid profile.

- Fasting plasma glucose – Target value is 0-99 mg/dl; measurement of 100-125 mg/dl indicates pre-diabetes while ≥126 mg/dl is classified as a diabetic reading
- Blood pressure – Target value is 120/80 mmHg; ≥140/90 mmHg denotes hypertension
- BMI – Target value is 18.5-25; measurement of >25 combined with a waist/hip ratio of >0.8 for women and >1 for men indicates unfavorable body fat distribution
- Total cholesterol – Target value <200mg/dL
  LDL – Target value <100 mg/dL
  HDL – Target value >40 mg/dL.
- Triglycerides – Target value <150 mg/dL

Any deviation from target in one or more of these values is indicative of some diabetic potential.

Patients response to treatment can be monitored with follow-up tests at three- to six-month intervals.

Potential Interactions

More often than not, diabetes patients use natural medicines in addition to their conventional medicines, not instead of their conventional medicines. This could be beneficial in some cases, but it might also lead to problems such as hypoglycemia. In some cases, conventional drug dose adjustments may be needed.

Patients taking metformin should have vitamin B12 levels checked regularly because regular use of metformin can cause a deficiency in both folic acid and vitamin B12, resulting in neurological impairment and disruption in homocysteine clearance.

Before insulin, botanical medicines were used to treat diabetes, many of which operate similarly to insulin. As such, diabetics currently taking oral medications or insulin should use caution with these to avoid the potential for a hypoglycemic interaction.

Under no circumstances should patients suddenly stop taking diabetic drugs, especially insulin. A type 1 diabetic will never be able to stop taking insulin. It is possible, however, to improve glucose metabolism, control, and tolerance in most diabetic patients.

Suggested Further Reading

http://ods.od.nih.gov
http://naturaldatabase.therapeuticresearch.com
http://www.cdc.gov
http://www.nutrametrix.org/nej/
Gene SNP™ Health Practitioners Guide (UnFranchise® downloads)
Natural Medicines Comprehensive Database (prescription information)
Supporting chromium and glucomannan supplements


Supporting chromium and coenzyme Q10 supplements


Supporting antioxidant supplements


Supporting B vitamin supplements

Supporting omega-3 and fish oil supplements
5. Knapp HR, FitzGerald GA. The antihypertensive effects of fish oil. A controlled study of polyunsaturated...

**Supporting fiber and L-glutamine supplements**