

# Dealing with the Complications of Diabetes

Neuropathy

Vision Problems

Heart Disease



# Diabetes: Quick Review

- Diabetes = high blood sugar levels
- Pancreas secretes the hormone insulin
- Insulin carries sugar from the bloodstream to the cells, where it is used for energy
- In Type 1 diabetes, the body makes little or no insulin
  - Must take insulin injections for life
  - Less common form of diabetes
- In Type 2 diabetes, cells do not respond to insulin (insulin resistance)
  - Must control blood sugar levels
  - Most common form of diabetes
  - **Preventable** and **Reversible** (especially in the early stages!)

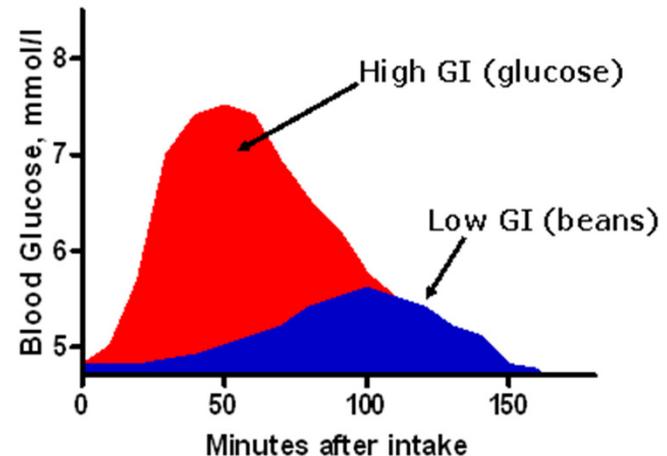
# Dealing with Type 2 Diabetes or “Prediabetes”

- Prediabetes means “borderline” – high blood sugar, but not high enough to be considered Type 2
- This is the time to Take Action!
- You must clean up your diet
  - NO high sugar, high sodium, chemical-laden, processed foods
  - If you are really serious, no grains or gluten
  - Get a Glycemic Index Chart and use it (see next slide)

# Glycemic Index 101

- Glycemic index measures the impact of carbohydrates on blood sugar levels
- High index food are digested and absorbed rapidly – sharp spike in blood glucose
- Low index foods are digested slowly, with a slow release of glucose in the bloodstream
- [www.glycemicindex.com](http://www.glycemicindex.com)

**Glycemic Index**



# Glycemic Index of Different Foods

## High (above 50)

- 98 potato (white, baked)
- 83 white rice (boiled)
- 80 cornflakes
- 71 white bread
- 66 hamburger on a bun
- 65 muffins
- 62 banana
- 57 ice cream

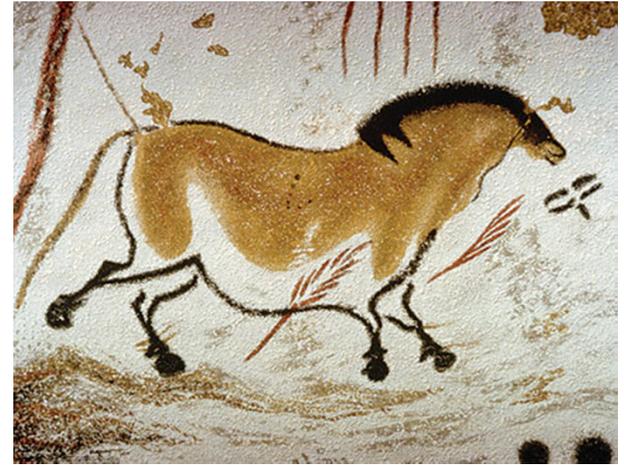
## Low (below 50)

- 6 hummus
- 7 peanuts
- 20 beans (kidney or black)
- 28 peaches
- 35 carrots (raw)
- 40 strawberries
- 40 plum, apple, orange
- 45 whole grain pasta

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# The Paleolithic Diet

- 30% animal protein
- 60% animal fat
- 10% non-starchy carbohydrates from fruits and vegetables
  - no more than 72 grams of carbohydrates daily
- 50 or less on the Glycemic Index



Dealing with Nerve Pain

# NEUROPATHY





# High Blood Sugar and Damaged Nerves

- High blood sugar is very irritating to nerves
- The “Why” is not fully understood
- What is important...
  - Keeping blood sugar levels down can prevent nerve damage
  - Once the damage has occurred, it is very difficult to reverse
  - The earlier you take action, the better the results will be

# Peripheral Neuropathy

- Peripheral = “away from the center”
- Peripheral neuropathy – one of the most common types of neuropathy
  - Usually affects hands and feet
  - Often associated with diabetes (although there are other causes)
- Symptoms: Weakness, numbness, tingling and pain
  - Often described as “burning feet”

# Easing Painful Nerves

- 3 Areas which need to be addressed
  - Circulation – proper blood flow carries nutrients and oxygen to the nerves
  - Inflammation – plays a significant role in the development and progression of nerve damage
  - Repair of nerves and nerve sheath (myelin)
- Promote nerve repair and pain relief with a combination of Bioactive B vitamins, Zinc, Chromium, and Alpha lipoic acid

# Bioactive B Vitamins

- Benefits:
  - No liver conversion required
  - Increase nitric oxide, which expands blood vessels and improves blood circulation
  - Reduce nerve pain and allow nerve healing to occur
- What to look for
  - Methylcobalamin: most effective form of B12 in treating nerve pain; essential for nerve repair and regeneration; shown in clinical trials to ease nerve pain, tingling and burning associated with neuropathy
  - P-5-P: reduces nerve pain; shown to prevent progression of nerve damage associated with diabetes
  - L-methylfolate reduces homocysteine; homocysteine interferes with nitric oxide activity
- This specific combination shown in a clinical trial to reduce nerve pain by almost 90%
- Combine with other B vitamins for best results: thiamin, riboflavin, biotin, niacin, pantothenic acid



# Zinc and Chromium

- Diabetes is frequently associated with low zinc and chromium levels
- Zinc supplements have been shown to improve blood sugar control
- Chromium is very effective at reducing blood sugar levels by increasing the effectiveness of insulin (increasing transport of sugar into cells)
- Additionally, chromium reduces inflammation associated with diabetes

# Alpha Lipoic Acid

- Antioxidant that is both fat and water-soluble
- Shown to lower blood sugar levels in people with diabetes
- Regularly used in Germany to treat diabetic neuropathy
  - Shown in clinical trials to reduce symptoms of neuropathy and slow its progression

Preserving Eyesight

# **VISION PROBLEMS**



# Diabetic Eye Problems

- Most common complication: diabetic retinopathy
  - Tiny blood vessels to the eye become blocked or leak, damaging the retina and causing vision problems
- Other problems
  - Temporary blurry vision: may be one of the first signs of high blood sugar; usually goes away once blood sugar is controlled
  - Cataracts: clouding of the lens
  - Glaucoma: increased blood pressure in the eye

# Omega-3 Fatty acids

- Benefits: anti-inflammatory and antioxidant
- Shown in a clinical trial to reduce eye pressure by almost 15% (glaucoma prevention)
- Very good at keeping blood vessels strong, especially blood vessels in the eyes
  - Shown to reduce the symptoms of retinopathy by 40-50% in an experimental model of diabetes
- May be able to slow cataract formation
- Source: Fish
  - Body can convert compounds in plants to the active form of omega-3 for the body, but people with diabetes

# Astaxanthin and Black Currant

- Astaxanthin is a natural anti-inflammatory that protects the blood vessels of the eyes
  - Antioxidant power 500 times stronger than vitamin E
  - Protects cells from the damaging effects of high blood sugar
  - Also shown to improve function of pancreatic cells (cells responsible for producing insulin)
- Black currant contains many beneficial and protective plant compounds
  - Shown to prevent eye strain and eye fatigue; may be able to prevent cataract formation

Reduce triglycerides, raise HDL, and decrease inflammation

# HEART DISEASE





# High Blood Sugar and Heart Disease Go Hand in Hand

- People with diabetes are 2 to 4 times more likely to develop heart disease
- 65% of people with diabetes die of heart disease
- People with diabetes usually have other risk factors for developing heart disease
  - High blood pressure
  - High triglycerides
  - Overweight or Obese

# Omega-3 Fatty Acids

- Inflammation damages blood vessels and leads to heart disease
- Omega-3 fatty acids reduce inflammation
- Particularly good at lowering triglyceride levels
- Help reduce the inflammation associated with plaque buildup
- Clinical trial results: people with diabetes who supplemented with omega-3 fatty acids reduced their risk of heart disease by 7 times
- In one study of people who had heart disease, omega-3 fatty acids reduced mortality (deaths) by 10%

# Indian Gooseberry (Amla)

- Antioxidant: prevents the oxidation of LDL cholesterol
- Oxidized LDL can “stick” in the lining of the artery wall
  - This attracts inflammatory cells, more cholesterol particles, calcium, and other debris
  - As these cells clump together, they form a plaque
    - This slows blood flow
    - If a blood clot forms on the plaque and then breaks off, causes a heart attack or stroke
- Amla keeps LDL cholesterol from oxidizing and sticking in the artery walls
- In an experimental model of diabetes, amla prevented oxidative stress caused by high blood sugar
- Amla has a long history of use in India to treat diabetes, where it is believed to prevent pancreatic inflammation and prevent insulin resistance

# Curcumin

- Better than statin drugs at preventing inflammation and plaque build-up
  - As effective as lovastatin at reducing triglyceride levels
  - High triglyceride levels can nearly triple your risk of heart attack
- Like amla, prevents LDL cholesterol from oxidizing
- Increases good HDL levels – in one study, increased HDL by 29%
- Additional benefits for diabetes...
  - In an experimental model of diabetes, curcumin was compared to the drug rosiglitazone (Avandia), and found to be equally as effective in reducing insulin resistance, inflammatory markers, and fats in the bloodstream
  - Also shown to improve insulin response and reduce blood sugar levels



# Conclusion

- Type 2 diabetes is preventable and reversible
- The earlier you take action, the better your results will be
- Dietary changes are crucial
- Natural supplements can prevent or reverse complications of diabetes