

Diabetes and Complications: for People (Part 3) Who Have Diabetes

**Satellite Conference
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Could I have diabetes?

- Low energy
- Extreme thirst
- Blurred vision
- Frequent urination



Could I have diabetes?

- Weight changes
- Irritability
- Tingling/
numbness
- Frequent
infections



What Complications Occur In Persons With Diabetes Mellitus?

- Kidney disease
–(Nephropathy)
- Eye disease
–(retinopathy, cataracts & glaucoma)
- Nerve damage
–(peripheral neuropathy, erectile
dysfunction, intestinal problems)

Other Things To Watch For:

- Depression
- Foot injuries
- Wounds that are slow to heal
- Vaginal yeast infections
- Gingivitis (gum disease)
- Sleep apnea
- High blood pressure
- Stroke
- Heart attack
- Dehydration

Why Do These Complications Occur?

- Complications probably result from long-term exposure to high levels of glucose
- Glucose attaches to proteins throughout the body, causing them damage

Why Do These Complications Occur?

- Nerves and blood vessels contain proteins that are “coated” with glucose
- Nerves become less responsive
- Blood vessels become more easily clogged and ruptured

What Is The Best Way To Slow Progression of Complications?

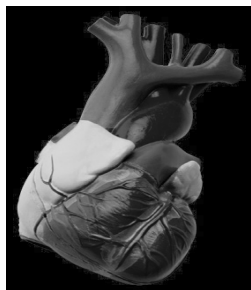
- Keep the blood glucose level in the normal range
- Eat sensibly
- Exercise sensibly
- Take medications as prescribed
- No smoking
- Modest alcohol consumption

Complications of Diabetes



Complications of Diabetes

- Heart and blood vessel disease



The blood vessels in your body are like the plumbing system in your house.

Clean water enters the system through one set of pipes, and used water leaves the system through a separate set of pipes.

In our bodies, the fresh blood travels through arteries, while the used blood returns to the heart through veins.

As our “pipes” get older, they build up sludge. This sludge can block the flow of blood to our brain (that is the cause of a stroke) or to our heart (that is the cause of a heart attack).

Complications of Diabetes

- Heart and blood vessel disease
- Kidney disease
- Eye damage
- Foot damage
- Infections, slow to heal
- Gum disease

The Risks - Macrovascular

- Heart disease – the #1 killer of persons with Type 2 diabetes
- Peripheral vascular disease
- Cerebral vascular disease
 - Individuals with diabetes are 2 to 4 times more likely to die of a heart attack or stroke

The Risks - Microvascular

- Retinopathy, potentially leading to blindness
 - 12,000 – 24,000 individuals with diabetes lose their sight each year
- Nephropathy, potentially leading to end-stage renal disease
 - 10% - 21% of persons with diabetes develop kidney disease

The Risks - Microvascular

- Neuropathy, potential cause of lower-limb amputations and erectile dysfunction
 - 60 - 70% of individuals with diabetes have nerve damage
 - 56,200 persons with diabetes have lower limb amputations each year

The Risks - Other

- Acute life-threatening events
 - Severe hyperglycemia, diabetic ketoacidosis
 - Severe hypoglycemia, insulin excess
- Dental disease
 - Two times higher risk in those with diabetes
 - One third of individuals with diabetes have severe periodontal disease

The Risks - Other

- Sleep apnea
- Depression
- More susceptible to many other illnesses and those with diabetes have a worse prognosis

High Blood Pressure – A Silent And Serious Disease



Age Increases Your Chance of High Blood Pressure

18 - 44 45 - 64 65+



% with High BP:
7% 35% 67%

Go For The Goal!



Most people **Persons with kidney disease or past heart attack** **Persons with diabetes**

Long-Term Complications of Diabetes



Stroke: 2-6x



Retinopathy: 25x



End-Stage Kidney Disease: 17x



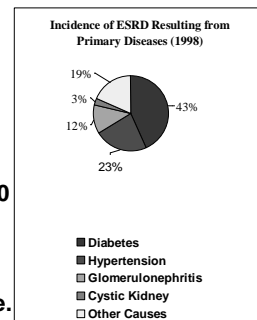
Heart Disease: 2-4x



Foot/Leg Amputations: 5x

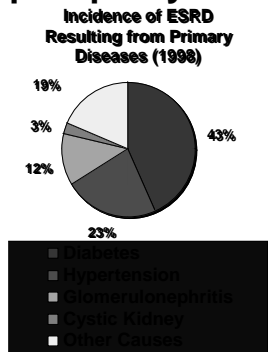
Diabetic Nephropathy

- Over 40% of new cases of end-stage renal disease (ESRD) are attributed to diabetes.
- In 2001, over 41,000 people with diabetes began treatment for end-stage renal disease.



Diabetic Nephropathy

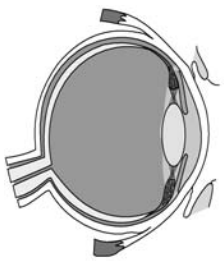
- In 2001, it cost \$22.8 billion in public and private funds to treat patients with kidney failure.
- Minorities experience higher than average rates of kidney disease.



Prevention of Diabetic Nephropathy

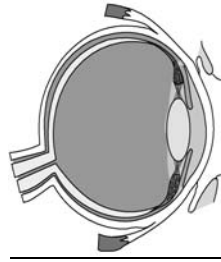
- Hypertension Control - Goal: lower blood pressure to <130/80 mmHg
- Treat high blood pressure with drugs
- Eat less salty foods
- Do not smoke
- Lose weight
- Have your urine checked for protein (albumin)
 - “Microalbumin Test”

Diabetic Retinopathy



- Diabetic retinopathy is the most common cause of new cases of blindness among adults 20-74 years of age.
- Each year, between 12,000 to 24,000 people lose their sight because of diabetes.

Diabetic Retinopathy



- During the first two decades of disease, nearly all patients with type 1 diabetes and over 60% of patients with type 2 diabetes have retinopathy.

DM-Related Blindness

- More than 20,000 people go blind each year
- 90% of cases of blindness could be prevented with proper screening and care
- Persons with diabetes are also at risk for cataracts (cloudy lens) and glaucoma (high pressure inside the eye)
- Only 60% of people with DM get an annual dilated-eye exam

Diabetic Neuropathy

- About 60-70% of people with diabetes have mild to severe forms of nervous system damage, including:
 - Impaired sensation or pain in the feet or hands
 - Slowed digestion of food in the stomach
 - Erectile dysfunction
 - Other nerve problems



Diabetic Neuropathy

- More than 60% of nontraumatic lower-limb amputations in the United States occur among people with diabetes.



Risk Factors

- Poor glucose control
- Duration of diabetes
- Damage to blood vessels
- Mechanical injury to nerves
- Genetic susceptibility
- Lifestyle factors
 - Smoking
 - Obesity

Essentials of Foot Care

- Foot examination for all patients at every visit to health care provider
- Patients with neuropathy - visual inspection of feet every day
 - Use a mirror if necessary

Essentials of Foot Care

- Use moisturizing lotion to prevent dryness and cracking on the bottom of the feet, but keep the area between the toes dry to prevent fungal growth
 - File calluses with a pumice stone, never cut them
 - Cut toenails weekly or as needed, use a podiatrist if necessary
 - Always wear cotton or wool socks and well-fitting shoes with an insert
 - Notify their health care provider immediately if any foot problems occur

Risk Factors You Cannot Change

- Increasing age
- Family history of disease
- Race or ethnicity
- Gestational diabetes or having a baby weighing 9+ lbs at birth

Risk Factors You Can Change

- Inactive lifestyle
- Overweight



Monitor Your Blood Glucose Frequently

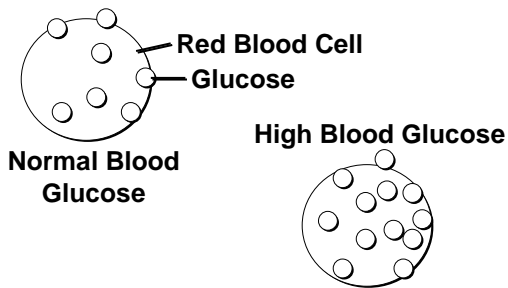
- Gain immediate information about how you are doing
- Monitor the effect of changes in lifestyle and medication adjustments
- Relate symptoms of high and low blood glucose with blood glucose test results

7-Day Trends in Blood Glucose Levels

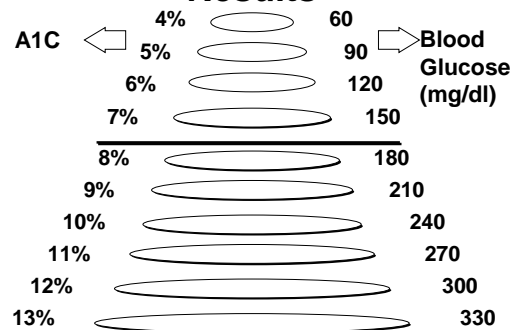
Recommended Testing Pattern

	Breakfast		Lunch		Supper		Bedtime
	Pre	Post	Pre	Post	Pre	Post	
Mon	✓	✓					✓
Tue	✓		✓	✓			
Wed	✓				✓	✓	
Thu	✓	✓					✓
Fri	✓		✓	✓			
Sat	✓				✓	✓	
Sun	✓	✓					✓

A1C Measures Glucose Levels over 2-3 Month Period



A1C and Self-Monitoring Results



Diabetes Treatment Cost Control Flow Chart

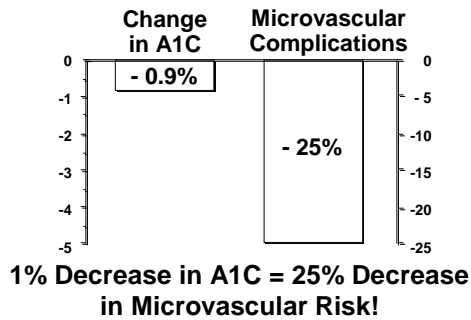
Levels of HgbA1C (%) Being Compared	Greater Per-Person Treatment Cost Associated with a 1 Percentage Higher HbA1C Value
10% with 9%	\$1,200 - \$4,100
9% with 8%	\$ 900 - \$3,100
8% with 7%	\$ 600 - \$2,200
7% with 6%	\$ 400 - \$1,500

Results From Diabetes Studies

Good Diabetes Management results in:

- **REDUCED** microvascular disease
 - eye disease
 - kidney disease
 - Neuropathy
- **REDUCED** macrovascular disease
 - heart disease
 - stroke

United Kingdom Prospective Diabetes Study



Factors That Increase Risk For Complications

- Poor blood sugar control
- Uncontrolled blood pressure
- High cholesterol
- Smoking

Eat Healthy Foods

- Avoid fatty foods
- Eat 5-9 servings of fruits and vegetables every day
- Avoid drinks containing sugar
- Do not “supersize” your portions

Be Alert To Kidney Disease

- Have your urine checked for protein on a regular basis
– “Microalbumin Test”

Exercise and Weight Loss

- Increases insulin sensitivity
- Increases HDL cholesterol (the good cholesterol)
- Decreases blood pressure and cholesterol
- Increases energy level

What is Regular Physical Activity? It’s not about vigorous exercise!

- Walking, bicycling, swimming or jogging
- Start with 10 minutes per day, 3-5 days a week
- Work up to 30 minutes, 7 days a week



Medications

Classes of Medications	Examples
Insulin	Lantus, Humalog, Novolog, Regular, NPH, Lente, Ultralente, NPH/R: 70/30, 75/25, 50/50
Secretagogues	Glucotrol, Glucotrol XL, Glyburide, Amaryl, Starlix, Prandin
Metformin	Glucophage
Thiazolidinediones	Avandia, Actose
Alpha-glucosidase Inhibitors	Precose, Acarbose
Combination Pills	Glucovance, Metaglip, Avandamet

What Is The Best Way To Slow Progression of Complications?

- Keep the blood glucose level in the normal range
- Eat sensibly
- Exercise sensibly
- Take medications as prescribed
- No smoking
- Modest alcohol consumption

Action Steps

- Follow your exercise plan
- Take your medications as prescribed
- Know Your Numbers!
 - Get all required tests
 - Monitor your blood glucose frequently

Summary

- Good diabetes control matters!
- Good control involves proper use of lifestyle tools and medications
- Regular and frequent monitoring of all aspects of diabetes is essential to good control
- Meet with your healthcare professional regularly to evaluate your treatment program

Get All Required Test

- Every Visit
 - Blood pressure
 - Foot exam
- Every 3-6 months
 - A1C
 - Every 3 months if initial value shows poor control
 - Every 6 months if initial value shows good control
- Every year
 - Eye Examination
 - Lipid Levels
 - Microalbumin

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