

# Preventing Type 2 Diabetes

Presented by  
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 (UPDON)

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## Diabetes Epidemic

- **Increasing prevalence**
  - 20.8 million US adults
    - 8.7% of those over age 20
    - 1/3 undiagnosed
  - 590,000 MI adults (~8% of population)
  - 19,220 UP adults (11% increase in 2 yrs)
  - Pre-diabetes: 52,085 UP adults
  - Metabolic syndrome: 40-50 million

## Diabetes Epidemic

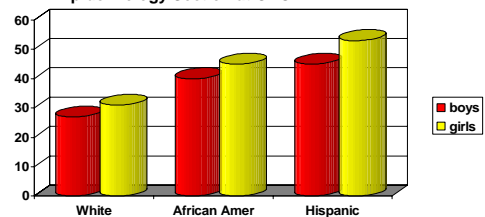
- **Seen at younger age**
  - 76% increase among 30-39 yo
- Type 2 in youth
  - **1980s:** 2% of children dx'd with DM had type 2
  - **Now:** accounts for 30-50% of new diagnoses among children aged 9-19
  - More common in those with family history of diabetes, minority groups, obese
  - Acanthosis nigricans



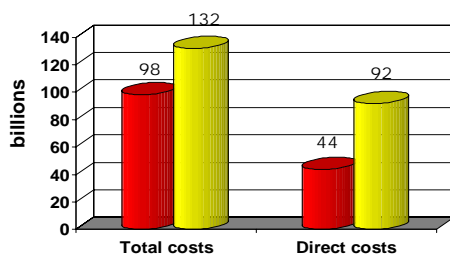
\*[http://www.ndep.nih.gov/diabetes/youth/youth\\_FS.htm#Statistics](http://www.ndep.nih.gov/diabetes/youth/youth_FS.htm#Statistics)

## Diabetes Epidemic

- **33% of boys and 39% of girls born in the year 2000 will develop diabetes in their lifetime.**
  - KM Venkat Narayan, MD, Chief of the Diabetes Epidemiology Section at CDC



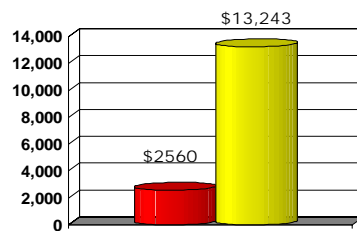
## The Economic Burden of Diabetes



Source: CDC Economic Costs of Diabetes in the US 2002

■ 1997 ■ 2002

## The Economic Burden of Diabetes



Source: CDC Economic Costs of Diabetes in the US 2002

■ Without DM ■ With DM

## The Economic Burden of Diabetes

- Death records often fail to reflect the diabetes costs
- 1 in 10 health care dollars now spent on diabetes
- 25% of the Medicare budget goes to diabetes

## Why is diabetes on the rise?

- Aging US population
  - By 2030, 20% of U.S. pop. (70 million) will be > 65 yo (**double the current %**)
  - 20.9% of those > 60 yo have diabetes
- Increase in ethnic minorities
  - Native Americans, Hispanic Americans, African Americans, Asian Americans, Pacific Islanders
  - Have a 2-5 fold increased risk

## Why is diabetes on the rise?

- Lowering diagnostic criteria from 140 mg/dl to 126 mg/dl
- Lowering criteria of normal BG

	FPG (mg/dl)	OGTT (mg/dl)
Normal	< 100*	< 140
Pre-diabetes	100* - 125	140 - 199
Diabetes	≥ 126	≥ 200

## Why is diabetes on the rise?

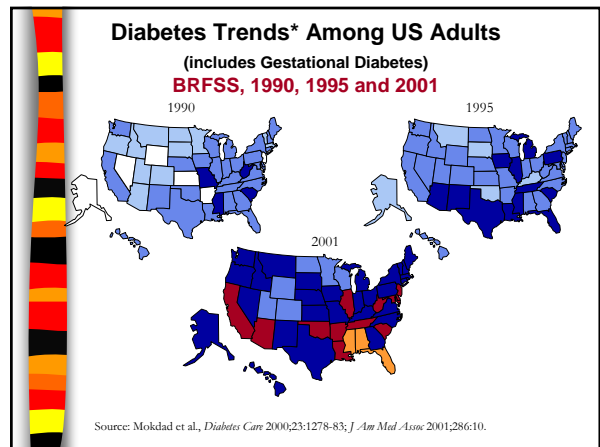
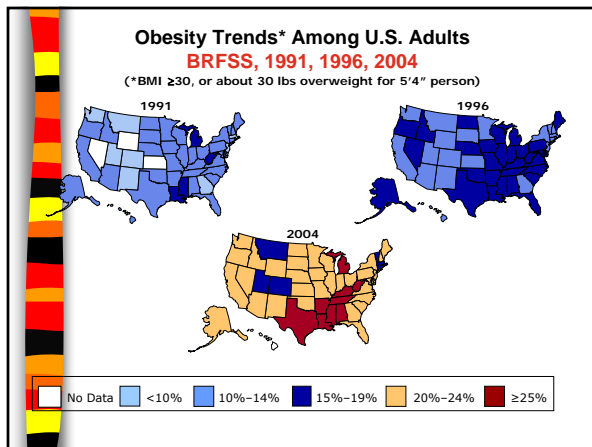
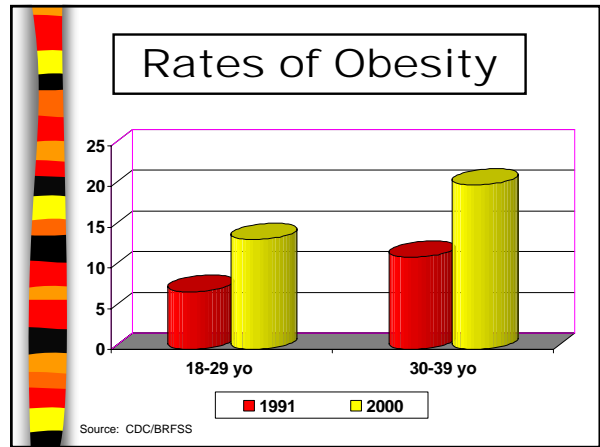
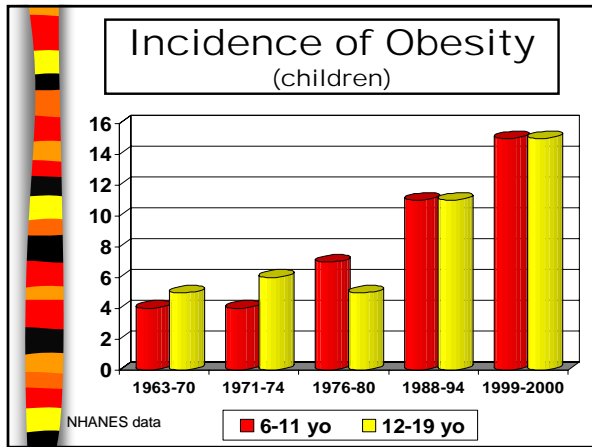
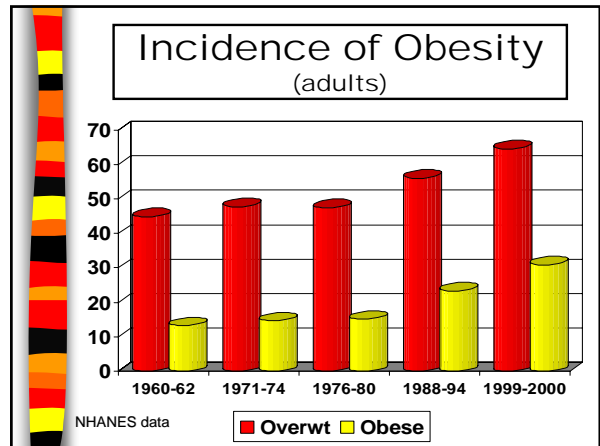
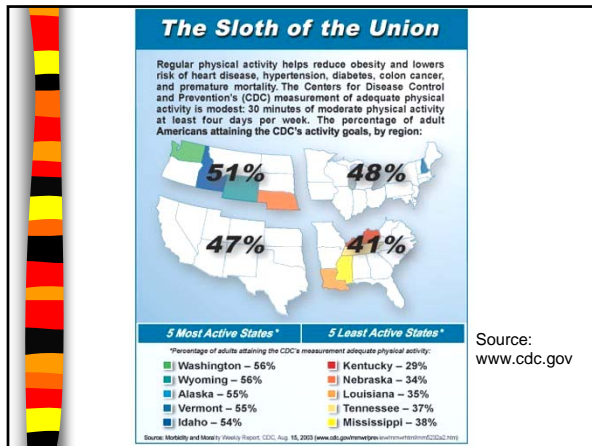
- Bigger push for diabetes screening
- Increase in sedentary lifestyles
- Increase in obesity

## Physical Inactivity Facts

- **Almost 10%** of the national health care expenditures are related to obesity and physical inactivity
- **Less than 1/3** of adults engage in the recommended amounts of physical activity.
- **43% of adolescents** watch more than 2 hours of television each day.

## Physical Inactivity Facts

- Many people live sedentary lives; in fact, **40% of US adults** do not participate in any leisure time physical activity.
- About **34%** of people over age 50 are sedentary
- **33%** of men and **50%** of women aged 75 and older engage in no leisure time physical activity



## Major Causes of Death & Disability In the U.S.

- Smoking
- Lack of exercise
- Poor dietary habits

## Smoking

- 70% of those who smoke want to quit!
- Michigan resources
  - I Can Quit (FREE Quit Smoking Coaching Hotline)
    - 1-800-480-QUIT (7848)
  - Free Quit Kit
    - 1-800-537-5666

## Who's Being Active?

Age Group	% who are active
12-17	18%
18-34	20%
35-54	23%
55 and older	26%

American Sports Data Inc (14,772 Americans)

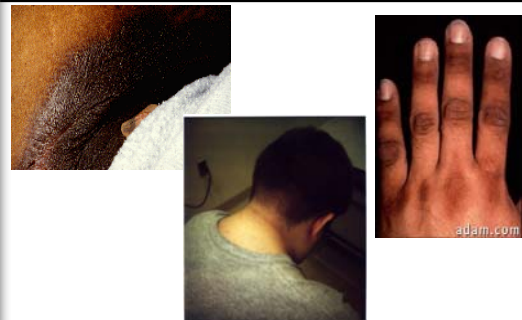
## Screening Recommendations for Pre-Diabetes (Adults)

- Everyone over age 45
  - especially if BMI >25
- Under age 45, overweight (BMI >25) plus one additional risk factor
  - First degree relative with diabetes
  - Previous GDM
  - High risk ethnic group
  - Hypertension
  - Dyslipidemia

## Screening Recommendations for Pre-Diabetes (Children)

- At age 10 or puberty if:
  - Overweight (BMI > 85<sup>th</sup> percentile for age and sex) **plus** 2 of the following risk factors
    - Family history
    - High risk ethnic group
    - Signs of insulin resistance (hypertension, dyslipidemia, acanthosis nigricans)

## Acanthosis Nigricans



## Risk factors for Diabetes

- Insulin resistance/Metabolic syndrome
  - Associated with HTN, dyslipidemia, PCOS and IGT
- Genetic
- Acquired
  - Central adiposity
  - Sedentary lifestyle
  - Aging
  - High fat diets



## Lifestyle Factors and Diabetes Prevention

- Physical Activity
- Weight Loss
- Whole Grains and Fiber
- Dietary Fat
- Alcohol

## Physical Activity

- An active lifestyle prevents or delays the development of type 2 diabetes

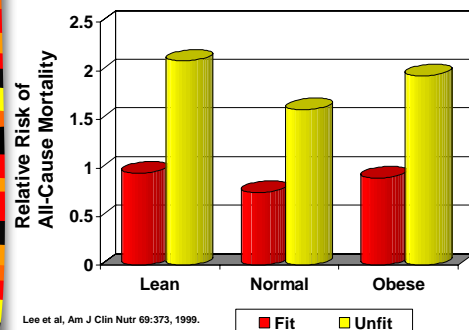
## Physical Activity

- Nearly half of 12 to 21-year olds do not engage in vigorous physical activity on a regular basis  
Source: [www.mediafamily.org/facts/facts\\_tvandobchild](http://www.mediafamily.org/facts/facts_tvandobchild)
- Daily participation in physical education class dropped from 42% in 1991 to 27% in 1997  
Source: [www.mediafamily.org/facts/facts\\_tvandobchild](http://www.mediafamily.org/facts/facts_tvandobchild)
- 43% of adolescents watch more than 2 hours of TV each day.  
Source: The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity

## Physical Activity Recommendations

- Goals
  - Adults: accumulate at least 30 minutes of moderate physical activity most days of the week.
  - Children: accumulate 60 minutes of moderate physical activity most days of the week.
  - More may be needed to prevent weight gain, to lose weight, or to maintain weight loss.
  - Minimum of 150 minutes/week to become fit
- Moderate intensity activities
  - Brisk walking, swimming
  - Vigorous physical activities

## Being Fit Reduces Mortality



## Getting Active

- **Walking/Step Programs**
  - Uses pedometers
  - ~2000 steps = 1 mile
  - Goal is 10,000 steps/day (5 miles)
  - Burns around 300 calories
- **For success**
  - Wear pedometer for a week and determine baseline
  - Gradually increase
    - 100 steps per minute and so on

## Web based 10,000 Step Programs

- **Diabetes in Control**
  - [www.diabetesincontrol.com/programs/steps/getstarted.shtml](http://www.diabetesincontrol.com/programs/steps/getstarted.shtml)
- **Health Partners**
  - [www.healthpartners.com](http://www.healthpartners.com) click on "Want to Lose weight"
- **PBS**
  - [www.pbs.org/americaswalking/health](http://www.pbs.org/americaswalking/health)
- **Shape Up America**
  - [www.shapeup.org](http://www.shapeup.org)

## Physical Activity Resources

- **President's Council on Physical Fitness & Sports**
  - *The Active Life* at [www.fitness.gov](http://www.fitness.gov)
- **Healthy People 2010**
  - *Steps to a Healthier US* at [www.healthierUS.gov](http://www.healthierUS.gov)
- **NIDDK Weight Control Information Network**
  - *Physical Activity and Weight Control*
  - *Active at Any Size*
  - [www.niddk.nih.gov/health/nutrit/nutrit.htm](http://www.niddk.nih.gov/health/nutrit/nutrit.htm)



## Physical Activity Resources

- **CDC**
  - *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity* at [www.surgeongeneral.gov/topics/obesity](http://www.surgeongeneral.gov/topics/obesity)
- **NHLBI Obesity Education Initiative**
  - [www.nhlbi.nih.gov/about/oei](http://www.nhlbi.nih.gov/about/oei)
- **HHS/NDEP Diabetes Prevention Campaign**
  - *Small Steps, Big Rewards; Steps to a Healthier US* at [www.ndep.nih.gov](http://www.ndep.nih.gov)

## Portion Distortion Quiz

[www.nhlbi.gov/portion/portion.cgi](http://www.nhlbi.gov/portion/portion.cgi)

### Spaghetti and Meatballs


20 Years Ago	vs	Today
		
1 cup spaghetti with sauce and 3 small meatballs 500 calories		??? calories
<ul style="list-style-type: none"> <li>■ How many calories do you think are in today's portion of spaghetti and meatballs?</li> </ul>		
1,025	600	800


Today's Portion of spaghetti and meatballs has **1,025** calories. This includes 2 cups of pasta with sauce and 3 large meatballs. This is **525** more calories than a portion 20 years ago.

**Now guess how long you will need to houseclean in order to burn those extra calories?\***

- 1 hour and 25 minutes
- 2 hours and 35 minutes
- 2 hours


\* Based on a 130 lb person






## Weight Loss

- Moderate, sustained weight loss has the potential to reduce the risk of type 2 diabetes




## Weight Loss

- **For insulin resistant individuals**
  - Decreased energy intake and modest weight loss improves insulin resistance in the short term
  - No long term studies available
- **San Antonio Heart Study**
  - A 1 BMI unit drop would reduce diabetes risk by 12% in Hispanics and 13% in Caucasians
- **Success seen with structured programs with frequent participant contact**
  - Reduced dietary fat and caloric intake
  - Increased physical activity




## XENDOS Study

- **4 year prospective, randomized, double blind trial with 3304 obese, Swedish individuals**
  - 79%: normal glucose tolerance
  - 21%: IGT or Metabolic syndrome
- **Control Group**
  - Lifestyle changes and placebo
- **Intervention Group**
  - Lifestyle changes plus **120 mg orlistat tid**




## XENDOS Study

- **For those with normal glucose tolerance:**
  - **37.3% reduction** in development of diabetes in orlistat group vs placebo
- **For those with impaired glucose tolerance:**
  - **45% reduction** in development of diabetes in orlistat group vs placebo
- **For those with metabolic syndrome:**
  - **36% reduction** in development of diabetes in orlistat group vs placebo



## National Weight Control Registry (NWCR)

- (800) 606-NWCR (6927)
- Founded in 1993.
- Long-term database of more than 3000 persons who have lost 30 lbs or more and maintained the loss for at least 1 yr.
- **At 1 yr follow-up**
  - 59% maintained wt loss
  - 6% lost additional wt
  - 35% regained more than 5 lbs



## Dietary Fat

- **Contributes to insulin resistance (independent of obesity)**
- **Evidence is most consistent showing adverse effects with saturated fats**
  - Omega 3 fa beneficial
  - Nuts beneficial
  - Effect of PUFA unclear

### Habits of Successful Weight Loss

- 89% changed both eating and activity habits
  - 30% used liquid formulas
  - Dine out <2.5 times a week
  - 78% ate breakfast every day (high fiber)
- High carbohydrate, low fat diet
  - 49% carbohydrate, 29% fat, 18% protein
  - Women: 1300 cal/day Men: 1700 cal/day
  - 17% did high protein, low carb (<90 g) diet

### Habits of Successful Weight Loss


- Expended almost 400 calories/day in physical activity
  - 77% walked for activity
  - Average length of being active: 60 minutes
- Self-monitoring
  - Weighed themselves frequently
  - Recorded food intake

### Whole Grains and Fiber

- An increased intake of whole grains and fiber can reduce the risk of diabetes.
- Increased insulin sensitivity is seen with increased intake of whole grains.

### Whole Grains and Diabetes Risk

Approximately 3 servings of whole grains daily



Iowa Women's Health Study	Nurse's Health Study
<b>21% risk reduction</b>	<b>27% risk reduction</b>

### Dietary Fat


- Increased dietary fat intake (independent of total caloric intake) is associated with increased incidence of type 2 diabetes

### Alcohol

- When compared to abstinence and heavy drinking, moderate alcohol intake is associated with reduced risk for diabetes and increased insulin sensitivity.

## Alcohol

- Moderate intake
  - 1 drink a day for women
  - 2 drinks a day for men
- Serving
  - 12 oz beer
  - 5 oz wine
  - 1 ½ oz distilled spirits

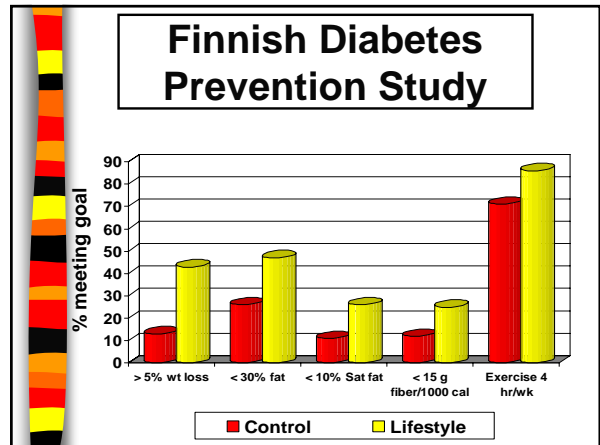


## DM Prevention Trials

- Finnish Diabetes Prevention Study
- Diabetes Prevention Program

## Finnish Diabetes Prevention Study

- 522 overweight individuals with IGT
- Control Group
  - General oral and written info
- Lifestyle Intervention Group
  - 7 sessions with RD the first year
  - 1 session q 3 mo thereafter
  - Individualized guidance

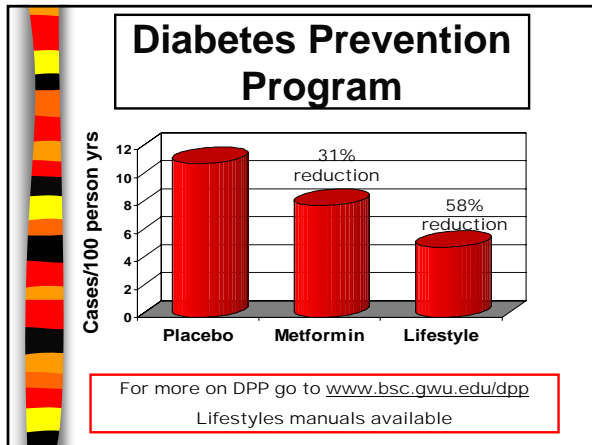
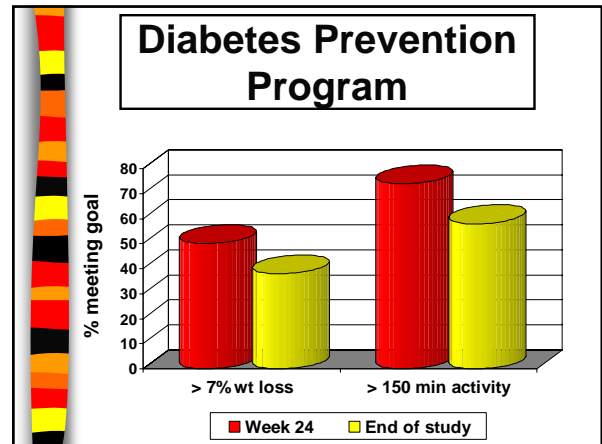
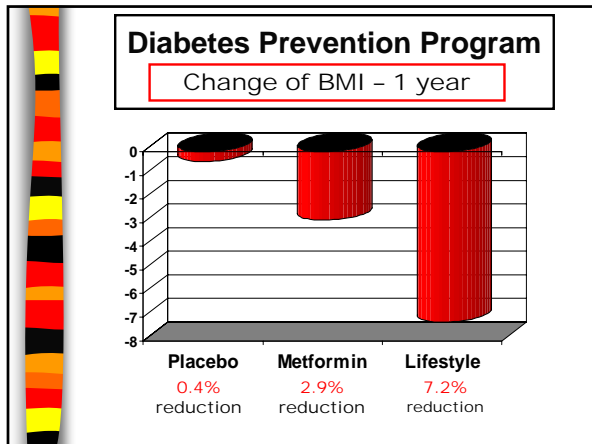


## Finnish Diabetes Prevention Outcomes

- Control Group
  - Lost 0.8 kg
- Lifestyle Intervention Group
  - Lost 3.5 kg
- Risk of developing diabetes was reduced by 58% in lifestyle group

## DM Prevention Program

- 3234 individuals (45% minority) with IGT
- Control Group
  - Annual 20-30 minute individual session
  - Standard written lifestyle advice plus placebo
- Metformin Group
  - Same as control group with 850 mg metformin bid
- Lifestyle Intervention Group
  - Monthly contact with case managers
  - 16 educational sessions in 24 weeks
  - GOAL: 7% wt loss (Low fat, low calorie meal plan)
  - 150 minutes/wk of physical activity



### Summary

- Diabetes is a serious health problem
- Take “steps” to reduce you and your families risk!

# Thank You

UPDON  
Diabetes Outreach Network  
1-800-369-9522  
[www.diabetesinmichigan.org](http://www.diabetesinmichigan.org)