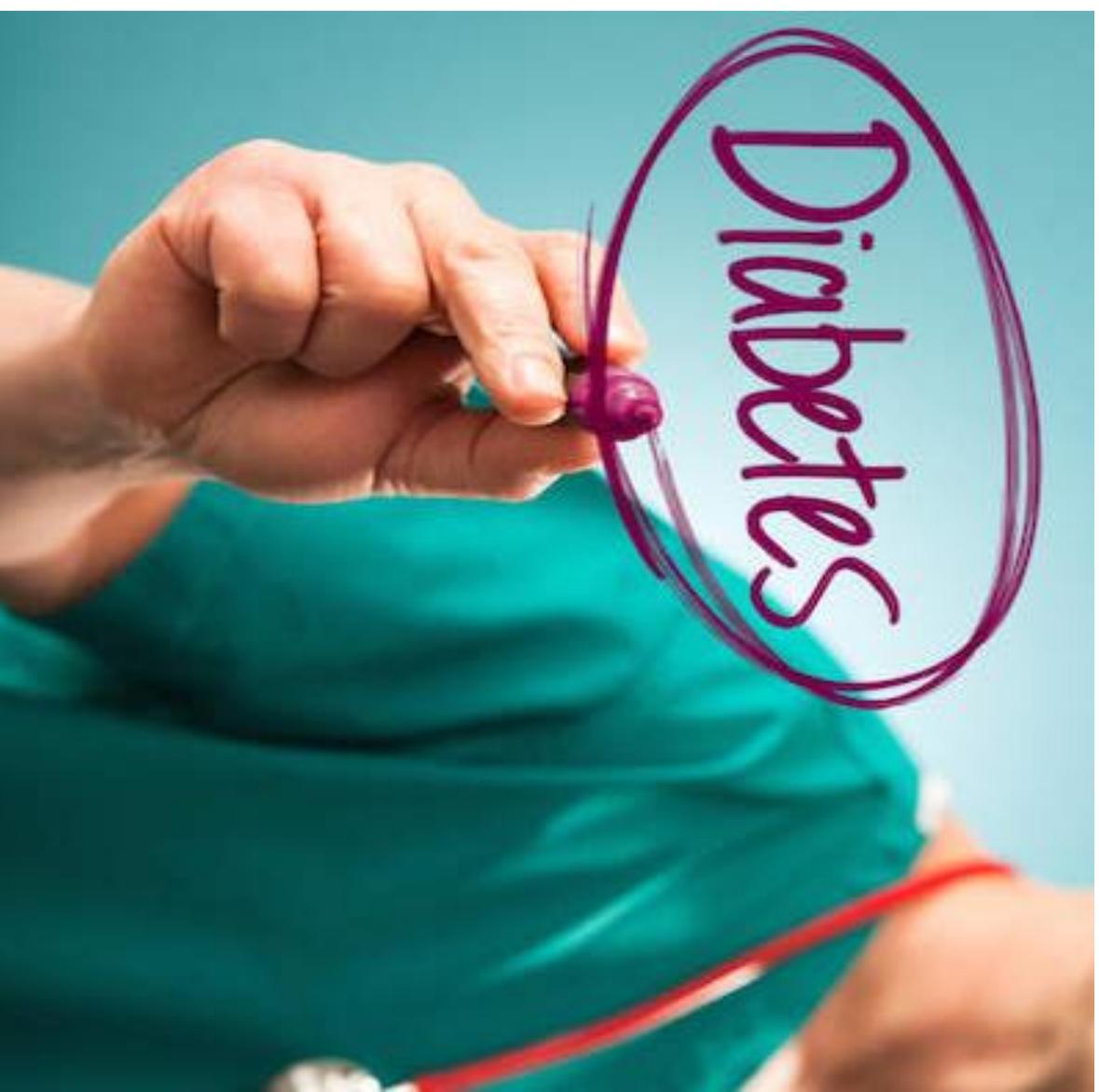


A close-up photograph of a person's hands using an insulin pen. The pen is blue and silver, and the needle is inserted into a finger. The background is dark and out of focus.

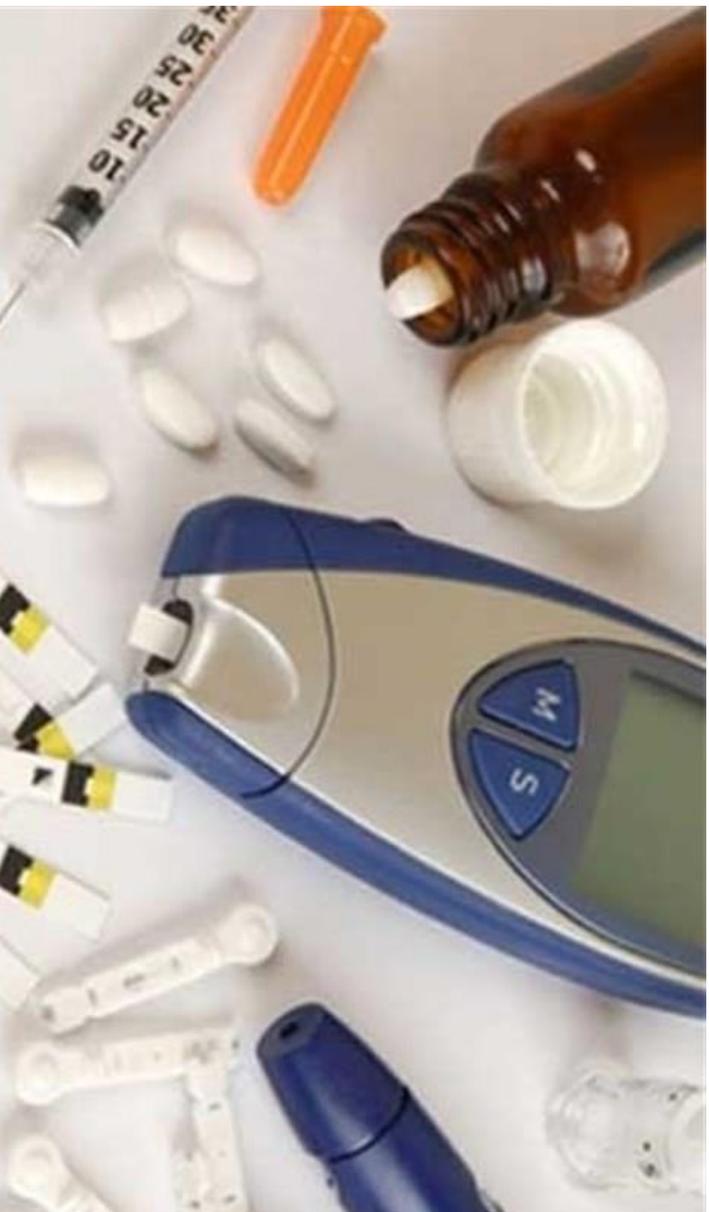
Chapter 7: Diabetes

Emily Mohs, Brittany Arnold, & Taylor Kollak

- From 1990 to 1998, the incidence of diabetes increased 33%.
- As of 1998, over 8% of American adults were diabetic.
- As of 2012, 9.3% of adults were diabetic, and over 200,000 kids under twenty had diabetes
- This translates to more than 29.1 million Americans.



**What is diabetes, why
should we care about it,
and how do we stop it
from happening to us?**



Two Faces of the Same Devil

- Almost all cases of diabetes are either Type I or Type II
- Type I developed in children and adolescents
 - 5% - 10% of all diabetes cases
- Type II occurs primarily in adults age 40+
 - 90% - 95% of all diabetes cases

Diabetes & the Metabolic Process

- Normal Metabolism
- As diabetes develops, the metabolic process collapses
- **Type I Diabetes**
 - Inadequate insulin production
 - Destroyed or dysfunctional insulin-producing cells in pancreas
 - Autoimmune disease
- **Type II Diabetes**
 - Insulin production – does not do its job effectively
 - Insulin resistance



What are the long-term health risks of disrupted glucose metabolism?

- Heart Disease
 - Stroke
 - High blood pressure
 - Blindness
 - Kidney Disease
 - Nervous System Damage
-
- Amputation
 - Dental Disease
 - Pregnancy complications
 - Increased susceptibility to other illnesses
 - Death

Additionally...

- Modern drugs and surgery offer no cure for diabetes
 - Allow diabetics to maintain a functional lifestyle
- Costly Disease
 - The economic toll of diabetes in the U.S.: over \$245 billion/year in 2013
- The right diet not only prevents but also treats diabetes.
 - What, then, is the "right" diet?

Now You See it, Now You Don't

- Documentation of populations with low rates of diabetes eating patterns differ from populations with high rates
- H.P. Himsworth - 90 years ago comparing diets and diabetes
- 30 years later four countries from Southeast Asia and South America were examined
- Enlarged to 11 countries

Within one population

- Old cross-cultural studies can be crude, and conclusions are not entirely reliable
- Difference may not just be diet but genetics instead
- Other unmeasured cultural factors
- Better study would involve a single population

The Seventh-day Adventists

- Their religion encourages them to avoid meat, fish, eggs, coffee, alcohol, and tobacco.
- Half are vegetarian
- 90% still get calories from dairy or egg products
- Half the rate of diabetes and obesity

Japanese American Men

- Japanese American men in Washington state
- More than 4x the prevalence of diabetes than those in Japan
- But why?

Curing the Incurable

- Studies mentioned are all observational
- James Anderson, MD
- High-fiber, high-carbohydrate, low-fat diet vs. American-style diet recommended by the American Diabetes Association

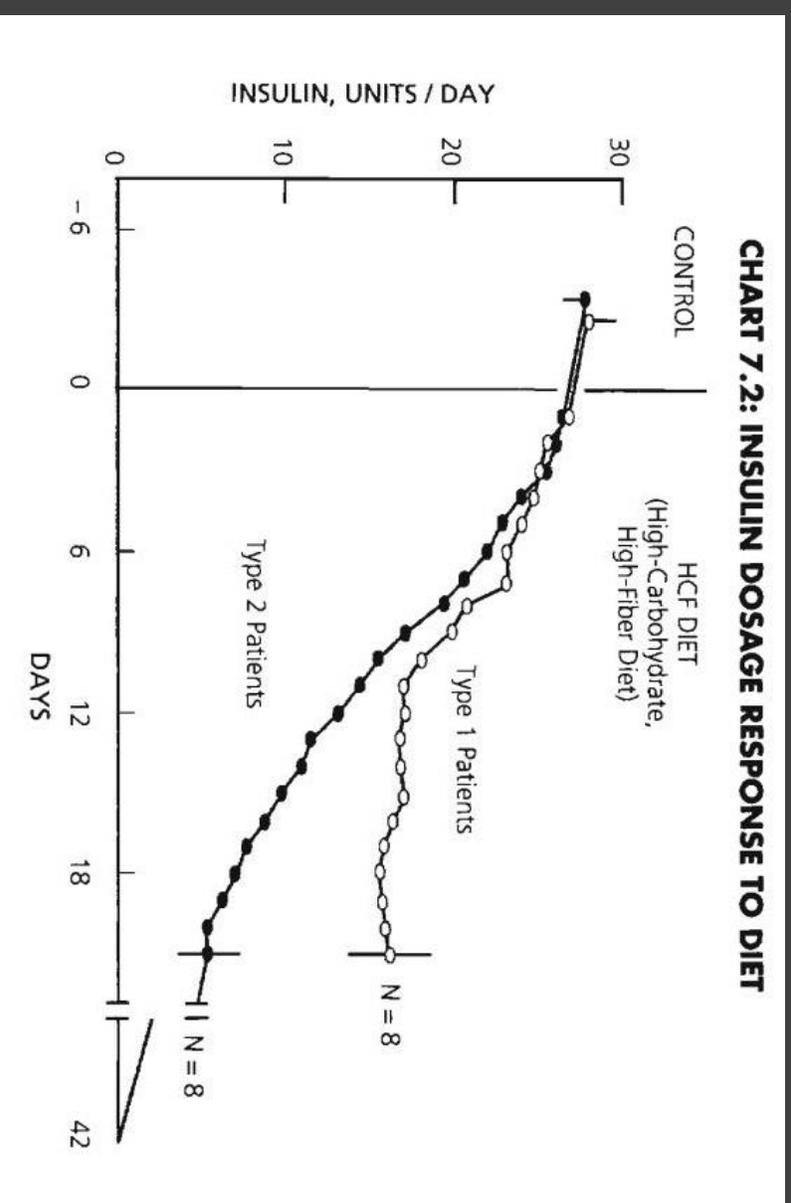
High-Carbohydrate, Low-Fat Diet

- 25 Type 1 diabetics and 25 Type 2 diabetics all taking insulin shots
 - Week 1: ADA recommended diet
 - Weeks 2-4: "veggie" diet (whole plant foods and the equivalent of a cold cut or two of meat a day)
- Results
 - Type 1 diabetics
 - ↓ insulin medication (40%)
 - ↓ cholesterol levels (30%)
 - Improved blood sugar levels
 - Type 2 diabetics
 - 24/25 patients stopped taking insulin medication



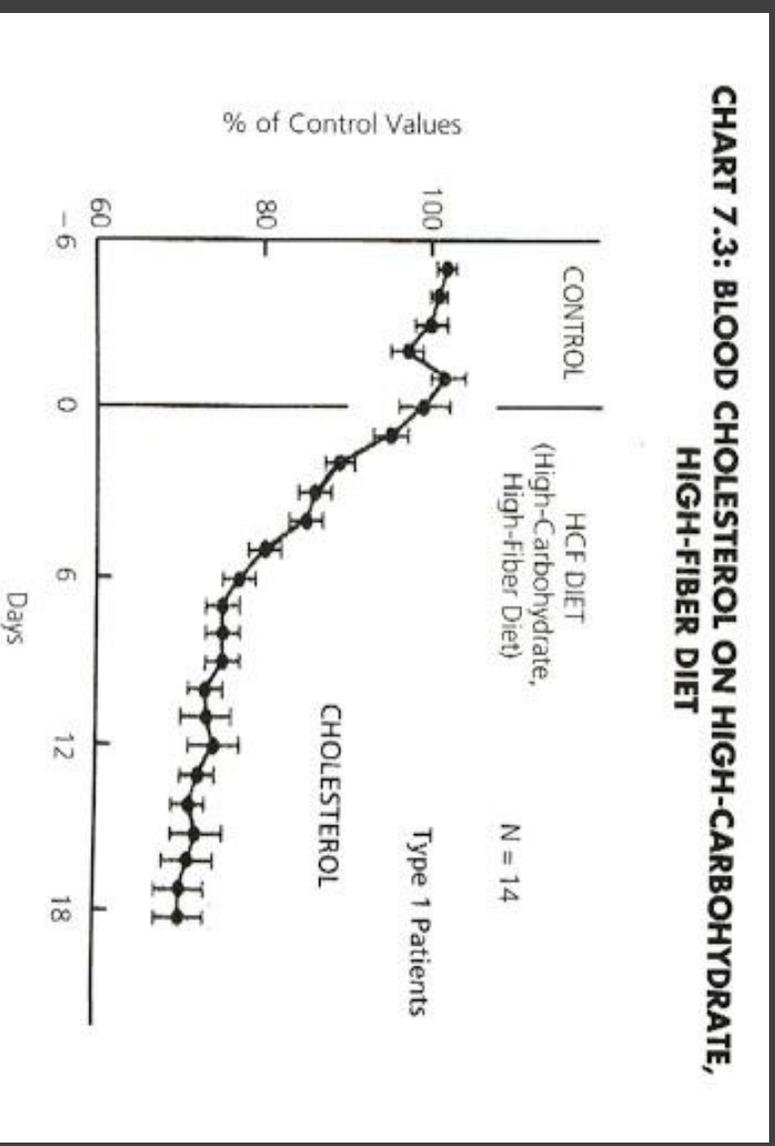
INSULIN DOSAGE RESPONSE TO DIET

- Sample of patients and how eating a plant-based diet lowered their insulin medications
- Insulin units/day decreased exponentially over the three weeks of this diet



BLOOD CHOLESTEROL ON HIGH-CARBOHYDRATE, HIGH-FIBER DIET

- 14 diabetic patients on the same plant-based diet
 - ↓ Total cholesterol levels (32%)
 - ↓ Blood cholesterol (went from 206 mg/dL to 141 mg/dL)
- No evidence that this cholesterol decrease was temporary as long as people continued on the diet



NUTRIENT COMPOSITION OF VEGAN, WFPB, AND ADA DIETS

- Dr. Neal Barnard 74-week study
- Compared the ADA recommended diet to a vegan diet and the impacts it had on
- The vegan group compliance
- ADA group shows that on this diet discontinuation of medication is impossible

Chart 7.4: Nutrient Composition of Vegan, WFPB, and ADA Diets

	WFPB	Vegan (Barnard's Study) ²⁴	ADA Equivalent (Barnard's Study) ²⁴	ADA (Recommended)
Fat, % cal	~10	22.3	33.7	<25-30
Carbohydrate, % cal	~80	66.3	46.5	45-60
Protein, % cal	~10	14.8	21.1	15-20
Cholesterol, mg/day	0	50	242	<200
Total fiber, g/day	50+	29.6	19	25-30

Lifestyle Intervention

- Exercise, weight loss, and low-fat diet
 - 58% fewer diabetes cases in individuals who exercise and change their diet
 - Only a 31% reduction in diabetes cases with medication (metformin) interventions alone



Controversies & Barriers

- Misinformation
- Ingrained habits
- Western diet & culture
- "Impracticality"

References

Campbell, T. C., & Campbell II, T. M. (2016). *The China Study*. Dallas, TX: BenBella Books, Inc. .