



Welcome to CDE Exam Boot Camp 5

Beverly Dyck Thomassian, RN, MPH, BC-ADM, CDE
President, Diabetes Education Services



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Boot Camp:

Class 5



- ▶ New nutrition guidelines
- ▶ Exercise Guidelines



Getting Ready

- ▶ Review Exchange List
- ▶ Review ADA Standards of Care:

Nutrition Therapy Recommendations for the Management of Adults With Diabetes

Reviews/Commentaries/ADA Statements

Exercise and Type 2 Diabetes

The American College of Sports Medicine and the American Diabetes Association: joint position statement

SHERI R. COLBERG, PhD, FACSM¹
RONALD J. SIGAL, MD, MPH, FRCPC²
BO FERNHALL, PhD, FACSM³
JUDITH C. REGENSTEINER, PhD⁴
BRYAN J. BLISSMER, PhD⁵

RICHARD R. RUBIN, PhD⁶
LISA CHASSAN-TABER, ScD, FACSM⁷
ANN L. ALBRECHT, PhD, MS⁸
BARRY BRAUN, PhD, FACSM⁹

disease (CVD), blindness, kidney and nerve disease, and amputation (26). Although regular physical activity (PA) may prevent or delay diabetes and its complications (10,46,89,112,176,208,259,294), most people with type 2 diabetes are not



Diabetes Education SERVICES

CDE Outline on MNT and Exercise

- C. Assess Current Knowledge and Self-Management Skills (20)
 1. Diabetes (e.g., pathophysiology)
 2. Eating patterns (food and beverage preferences, portion sizes, timing of meals and snacks, eating environment, disordered eating, etc.)
 3. Exercise/Physical activity history and/or level
 4. Monitoring techniques and equipment (blood glucose, ketones, blood pressure, weight, foot examination, etc.)
 5. Record keeping activities (blood glucose, food, activity, etc.)
 6. Medication use (oral and injectable medications, administration technique, delivery systems, timing and dosage, adherence, etc.)
 7. Use of health care resources (health care professionals, insurance, etc.)
- d) Effects and interactions of physical activity, food, medication, and stress
4. Nutrition principles and guidelines
 - a) ADA and Academy of Nutrition and Dietetics nutrition recommendations (meal planning, macro/micronutrients, etc.)
 - b) Carbohydrates (food source, sugar substitutes, fiber, carbohydrate counting, etc.)
 - c) Fats (total, saturated, monounsaturated, etc.)
 - d) Protein (renal disease, wound care, etc.)
 - e) Food and medication integration (medication timing, meal timing, etc.)
 - f) Food label interpretation (nutrition facts, ingredients, health claims, etc.)
 - g) Alcohol (amount, precautions)
 - h) Weight management (adult and childhood obesity, failure to thrive, etc.)
 - i) Special considerations (food allergies, gastroparesis, celiac disease, bariatric surgery, etc.)
5. Physical activity
 - a) ADA and American College of Sports Medicine recommendations
 - b) Benefits, barriers, and precautions (e.g., post exercise delayed onset hypoglycemia)
 - c) Exercise/Activity plan (aerobic, resistance training, etc.)
 - d) Adjustment of monitoring, food, and/or medication



Diabetes Education SERVICES

Poll Question 1

- ▶ How many grams of carb is in the following breakfast? 1 cup of oatmeal, ½ cup of milk, ½ cup of berries?
- a. 57 gms
 - b. 36 gms
 - c. 51 gms
 - d. 37 gms



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Poll Question 2

- ▶ Which has the most saturated fat per ounce?
- a. Salmon
 - b. Olives
 - c. Peanuts
 - d. Soybean oil



Diabetes Education
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Poll Question 3

- ▶ Alice has type 1, drank 4 rum and cokes and ate some snacks. She took 3 units insulin via her pump. HS BG is 162. Drinking alcohol puts Alice at risk for:
- DKA due to ketone production associated with alcohol
 - Hyperglycemia during night due to gluconeogenesis
 - Hyperglycemia from alcohol and appetizers
 - Hypoglycemia



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Poll question 4

- ▶ John has gastroparesis. What is the best recommendation?
- Eat raw vegetables and limit fruit
 - Eat low fiber, small meals
 - Always take insulin after meals
 - Avoid foods containing wheat



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Poll question 5

- ▶ Joan has type 1 diabetes, teaches aerobics with a BMI of 17. Fasting BG 312-380s. Which is most important intervention to improve her diabetes control?
- a. Eat a 15 gm carb snack before teaching class.
 - b. Acknowledge this hyperglycemia signifies end of honeymoon period
 - c. Referral to mental health professional
 - d. Increase basal insulin dose



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Poll question 6

- ▶ What best describes normal hormone response during exercise?
- a. Insulin and counter regulatory hormones are suppressed
 - b. Insulin levels increase, gluconeogenesis decreases
 - c. Insulin action is suppressed, increased gluconeogenesis
 - d. Increase in insulin, uptake of glycogen
 - e.



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Poll question 7

- ▶ According to ADA guidelines, who needs a graded exercise test with EKG?
 - a. 25 year old, overweight female, diabetes 5 yrs
 - b. 30 yr old male, type 2 dm, BMI of 31
 - c. 38 yr old male, type 1 for 10 yr, hx of retinopathy
 - d. 38 yr old obese woman with history of GDM



Diabetes Education
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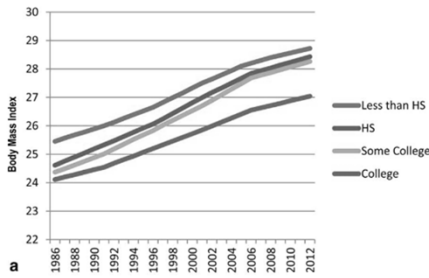
Poll question 8

- ▶ Which of the following is a learning objective?
 - a. Record food intake for 1 month
 - b. Identify carbohydrate food each meal
 - c. Drink non-caloric beverages instead of soda
 - d. Eat 3 servings of carbs at dinner

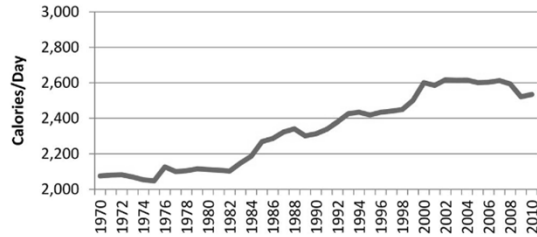


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Obesity in America



- ▶ 68% overweight or obese
 - ▶ 34% BMI 30 +, 34% BMI 25-29
- ▶ 1/3 of all overwt people don't get diabetes
- ▶ We burn 100 cals less a day at work
- ▶ Overall, food costs ~ 10-15% of income
- ▶ Calorie Intake is on the rise

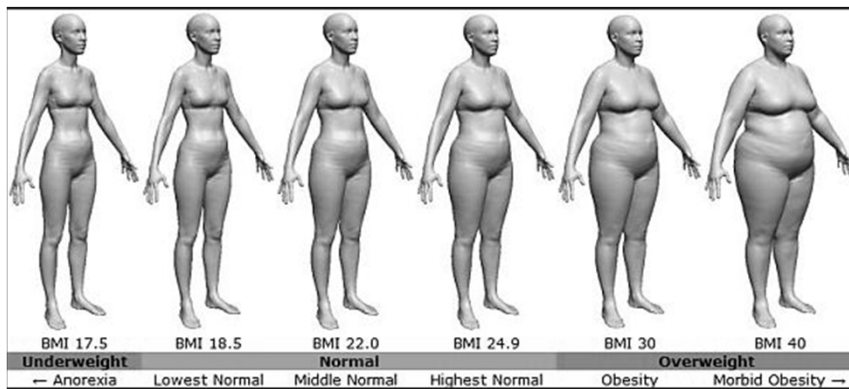


Average Daily Per Capita Calories Adjusted for Waste. Source: Economic Research Service of the United States Department of Agriculture (Per Capita) Data System.



Diabetes Education SERVICES

BMI – Visual Image



Diabetes Education SERVICES

BMI Chart with Ranges

| | | Body Mass Index Table | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|-----------------------|-----|-----|-----|-----|-----|-----|-----|------------|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Normal | | | | | | | | Overweight | | | | | | | | Obese | | | | | | | | Extreme Obesity | | | | | | | | | | | |
| BMI | | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 |
| Height (inches) | | Body Weight (pounds) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58 | | 91 | 96 | 100 | 105 | 110 | 115 | 119 | 124 | 129 | 134 | 138 | 143 | 148 | 153 | 158 | 162 | 167 | 172 | 177 | 181 | 186 | 191 | 196 | 201 | 205 | 210 | 215 | 220 | 224 | 229 | 234 | 239 | 244 | 248 | 253 | 258 |
| 59 | | 94 | 99 | 104 | 109 | 114 | 119 | 124 | 128 | 133 | 138 | 143 | 148 | 153 | 158 | 163 | 168 | 173 | 178 | 183 | 188 | 193 | 198 | 203 | 208 | 212 | 217 | 222 | 227 | 232 | 237 | 242 | 247 | 252 | 257 | 262 | 267 |
| 60 | | 97 | 102 | 107 | 112 | 118 | 123 | 128 | 133 | 138 | 143 | 148 | 153 | 158 | 163 | 168 | 174 | 179 | 184 | 189 | 194 | 199 | 204 | 209 | 215 | 220 | 225 | 230 | 235 | 240 | 245 | 250 | 255 | 261 | 266 | 271 | 276 |
| 61 | | 100 | 106 | 111 | 116 | 122 | 127 | 132 | 137 | 143 | 148 | 153 | 158 | 164 | 169 | 174 | 180 | 185 | 190 | 195 | 201 | 206 | 211 | 217 | 222 | 227 | 232 | 238 | 243 | 248 | 254 | 259 | 264 | 269 | 275 | 280 | 285 |
| 62 | | 104 | 109 | 115 | 120 | 126 | 131 | 136 | 142 | 147 | 153 | 158 | 164 | 169 | 175 | 180 | 186 | 191 | 196 | 202 | 207 | 213 | 218 | 224 | 229 | 235 | 240 | 246 | 251 | 256 | 262 | 267 | 273 | 278 | 284 | 289 | 295 |
| 63 | | 107 | 113 | 118 | 124 | 130 | 135 | 141 | 146 | 152 | 158 | 163 | 169 | 175 | 180 | 186 | 191 | 197 | 203 | 208 | 214 | 220 | 225 | 231 | 237 | 242 | 248 | 254 | 259 | 265 | 270 | 278 | 282 | 287 | 293 | 299 | 304 |
| 64 | | 110 | 116 | 122 | 128 | 134 | 140 | 145 | 151 | 157 | 163 | 169 | 174 | 180 | 186 | 192 | 197 | 204 | 209 | 215 | 221 | 227 | 232 | 238 | 244 | 250 | 256 | 262 | 267 | 273 | 279 | 285 | 291 | 296 | 302 | 308 | 314 |
| 65 | | 114 | 120 | 126 | 132 | 138 | 144 | 150 | 156 | 162 | 168 | 174 | 180 | 186 | 192 | 198 | 204 | 210 | 216 | 222 | 228 | 234 | 240 | 246 | 252 | 258 | 264 | 270 | 276 | 282 | 288 | 294 | 300 | 306 | 312 | 318 | 324 |
| 66 | | 118 | 124 | 130 | 136 | 142 | 148 | 155 | 161 | 167 | 173 | 179 | 186 | 192 | 198 | 204 | 210 | 216 | 223 | 229 | 235 | 241 | 247 | 253 | 260 | 266 | 272 | 278 | 284 | 291 | 297 | 303 | 309 | 315 | 322 | 328 | 334 |
| 67 | | 121 | 127 | 134 | 140 | 146 | 153 | 159 | 166 | 172 | 178 | 185 | 191 | 198 | 204 | 211 | 217 | 223 | 230 | 236 | 242 | 249 | 255 | 261 | 268 | 274 | 280 | 287 | 293 | 299 | 306 | 312 | 319 | 325 | 331 | 338 | 344 |
| 68 | | 125 | 131 | 138 | 144 | 151 | 158 | 164 | 171 | 177 | 184 | 190 | 197 | 203 | 210 | 216 | 223 | 230 | 236 | 243 | 249 | 256 | 262 | 269 | 276 | 282 | 289 | 295 | 302 | 308 | 315 | 322 | 328 | 335 | 341 | 348 | 354 |
| 69 | | 128 | 135 | 142 | 149 | 155 | 162 | 169 | 176 | 182 | 189 | 196 | 203 | 209 | 216 | 223 | 230 | 236 | 243 | 250 | 257 | 263 | 270 | 277 | 284 | 291 | 297 | 304 | 311 | 318 | 324 | 331 | 338 | 345 | 351 | 358 | 365 |
| 70 | | 132 | 139 | 146 | 153 | 160 | 167 | 174 | 181 | 188 | 195 | 202 | 209 | 216 | 222 | 229 | 236 | 243 | 250 | 257 | 264 | 271 | 278 | 285 | 292 | 299 | 306 | 313 | 320 | 327 | 334 | 341 | 348 | 355 | 362 | 369 | 376 |
| 71 | | 136 | 143 | 150 | 157 | 165 | 172 | 179 | 186 | 193 | 200 | 208 | 215 | 222 | 229 | 236 | 243 | 250 | 257 | 265 | 272 | 279 | 286 | 293 | 301 | 308 | 315 | 322 | 329 | 336 | 343 | 351 | 358 | 365 | 372 | 379 | 386 |
| 72 | | 140 | 147 | 154 | 162 | 169 | 177 | 184 | 191 | 199 | 206 | 213 | 221 | 228 | 235 | 242 | 250 | 258 | 265 | 272 | 279 | 287 | 294 | 302 | 309 | 316 | 324 | 331 | 338 | 346 | 353 | 361 | 368 | 375 | 383 | 390 | 397 |
| 73 | | 144 | 151 | 159 | 166 | 174 | 182 | 189 | 197 | 204 | 212 | 219 | 227 | 235 | 242 | 250 | 257 | 265 | 272 | 280 | 288 | 295 | 302 | 310 | 318 | 325 | 333 | 340 | 348 | 355 | 363 | 371 | 378 | 386 | 393 | 401 | 408 |
| 74 | | 148 | 155 | 163 | 171 | 179 | 186 | 194 | 202 | 210 | 218 | 225 | 233 | 241 | 249 | 256 | 264 | 272 | 280 | 287 | 295 | 303 | 311 | 319 | 326 | 334 | 342 | 350 | 358 | 365 | 373 | 381 | 389 | 396 | 404 | 412 | 420 |
| 75 | | 152 | 160 | 168 | 176 | 184 | 192 | 200 | 208 | 216 | 224 | 232 | 240 | 248 | 256 | 264 | 272 | 279 | 287 | 295 | 303 | 311 | 319 | 327 | 335 | 343 | 351 | 359 | 367 | 375 | 383 | 391 | 399 | 407 | 415 | 423 | 431 |
| 76 | | 156 | 164 | 172 | 180 | 189 | 197 | 205 | 213 | 221 | 230 | 238 | 246 | 254 | 263 | 271 | 279 | 287 | 295 | 304 | 312 | 320 | 328 | 336 | 344 | 353 | 361 | 369 | 377 | 385 | 394 | 402 | 410 | 418 | 426 | 435 | 443 |

Source: Adapted from Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report



Diabetes Education SERVICES

Average American Consumes 25 teaspoons of sugar a day (400 cal)

- ▶ Warning label on sodas proposed
- ▶ One soda has 12 teaspoons soda
- ▶ On avg, 1 person consumes 40 gallons of soda each year
- ▶ ADA guidelines “limit sodas and beverages with sugar, High Fructose Corn Syrup, (HFCS)



Diabetes Education SERVICES

Caloric Sweeteners



- ▶ **Nutritive sweeteners (sucrose and fructose)**
 - ▶ Sucrose does not increase glucose more than isocaloric amounts of starch
 - ▶ Okay to include in meal plan but avoid excess sucrose intake
 - ▶ Fructose as sweetener not recommended since may adversely affect lipids. Naturally occurring fructose okay.

- ▶ **Reduced calorie sweeteners (sugar alcohols)**
 - ▶ Not completely absorbed, so less calories
 - ▶ Unpleasant side effects, diarrhea, bloating and gas
 - ▶ Sorbitol, maltitol, erythritol, isomalt, xylitol, lactitol, mannitol, tagtose



Diabetes Education
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Nonnutritive Sweeteners

- ▶ **FDA: 6 approved for use**
 - ▶ NutraSweet/Equal
 - ▶ Sweet One / Sunett
 - ▶ Splenda
 - ▶ Sweet N' Low

- ▶ **FDA Stance - No indication that they will cause wt loss or wt gain.**

- ▶ **Safe for public, people with diabetes, pregnant women**



Diabetes Education
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Medical Nutrition Therapy – ADA 2014



- No ideal percentage of calories from protein, carbohydrate and fat for people with diabetes.
- Macronutrient distribution should be based on an *individualized assessment* of eating patterns, preferences and metabolic goals.



Diabetes Education
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Assess Knowledge, Self Management Skills

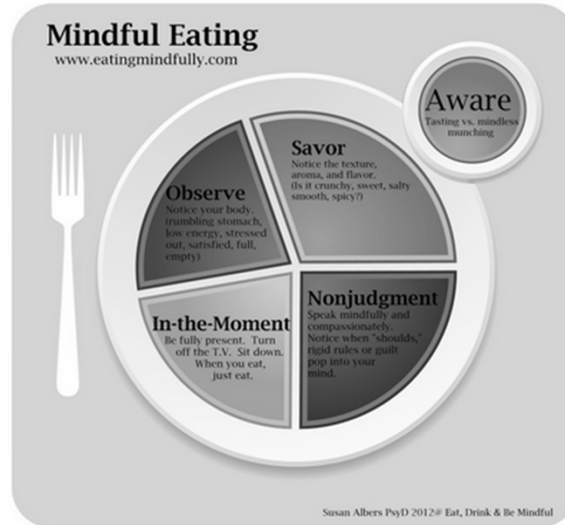
▶ Eating Patterns

- ▶ Preferences, portion sizes, timing on meals and snacks, eating environment, disordered eating



Diabetes Education
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Mindful Eating



Diabetes Education
SERVICES

Medical Nutrition Therapy – ADA 2014

- ▶ Focus on the Individual
- ▶ Maintain pleasure of eating
- ▶ Provide positive messages about food
- ▶ Limit food choices only when backed by science
- ▶ Provide practical tools
- ▶ Refer to a RD and Diabetes Education – Lowers A1c by 1-2%



Diabetes Education
SERVICES

RDs Rock



Table 2—Academy of Nutrition and Dietetics Evidence-Based Nutrition Practice Guidelines

Academy of Nutrition and Dietetics Evidence-Based Nutrition Practice Guidelines recommend the following structure for the implementation of MNT for adults with diabetes (11)

- A series of 3–4 encounters with an RD lasting from 45–90 min.
- The series of encounters should begin at diagnosis of diabetes or at first referral to an RD for MNT for diabetes and should be completed within 3–6 months.
- The RD should determine whether additional MNT encounters are needed.
- At least 1 follow-up encounter is recommended annually to reinforce lifestyle changes and to evaluate and monitor outcomes that indicate the need for changes in MNT or medication(s); an RD should determine whether additional MNT encounters are needed.



Diabetes Education
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Approach Depends on Patient

- New Type 2
 - Portion Control
 - Plate Method
 - Record Keeping
 - Education
- On Insulin?
 - Carb counting
 - Post prandial checks



Diabetes Education
SERVICES

Nutrition Guidelines

- ▶ ADA and Academy of Dietetics recommendations
- ▶ Carbs (good source, sugar substitutes, fiber, carb counting)
- ▶ Fats (total, saturated, monounsaturated)
- ▶ Protein (renal disease, wound care, etc)
- ▶ Food and medication integration
- ▶ Food label interpretation



Diabetes Education
SERVICES

Sodium, Fat and Fiber

- ▶ Sodium – Try and keep less than 2,300 mg a day
- ▶ Vitamin and mineral supplements not recommended -lack of evidence.
- ▶ Fat - same as recommended for general population
 - ▶ Less than 10% saturated fat,
 - ▶ Limit trans fats
 - ▶ Less than 300 mg cholesterol daily
 - ▶ Mediterranean Diet looks like good option
- ▶ Fiber 25 -38 gms a day



Diabetes Education
SERVICES

ADA recommendation Eat Less Junk Food & Sugary Drinks –

- ▶ Less Processed Foods
- ▶ Less Sugary Beverages
 - ▶ increase visceral adiposity
 - ▶ With sugar or
 - ▶ High fructose corn syrup
- ▶ Soda Tax?
- ▶ Junk Food Tax?



Diabetes Education
SERVICES

Teaching About Eating Healthy

Major food groups

“Handy Diet”

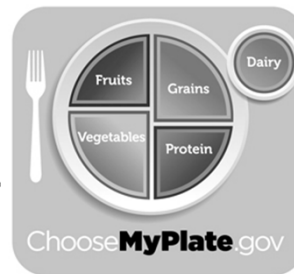
Plate Method

Exchange Lists

Food Diaries / Glucose
Records

Carbohydrate Counting

Assess what is best for the situation.



Diabetes Education
SERVICES

USDA www.myplate.gov

Balancing Calories

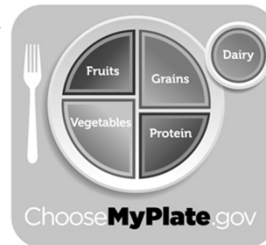
- ▶ Enjoy your food, but eat less.
- ▶ Avoid oversized portions.

Foods to Increase

- ▶ Make half your plate fruits and vegetables.
- ▶ Make at least half your grains whole grains.
- ▶ Switch to fat-free or low-fat (1%) milk.

Foods to Reduce

- ▶ Compare sodium in foods like soup, bread, and frozen meals — and choose the foods with lower numbers.
- Drink water instead of sugary drinks.



Diabetes Education
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Another plate example

Mi planificador de plato **Una comida saludable sabe buenísima**



El Método del Plato es una manera simple de planificar las comidas para usted y su familia. No necesita contar nada ni leer largas listas de alimentos. Todo lo que necesita es un plato de 9 pulgadas.

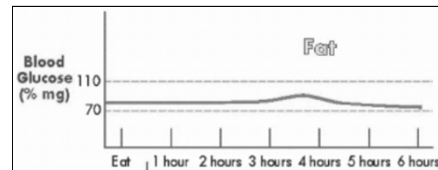
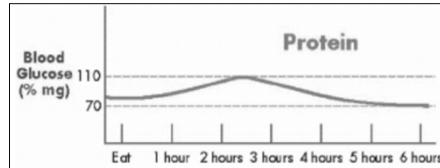
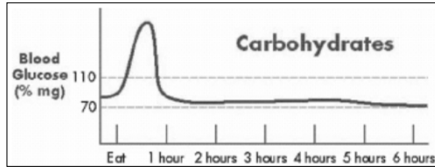
NVC
Michael S. Rhee, MD, MPA, FACP
Diabetes Education Services

1/4 de proteína. 1/4 de almidón. 1/2 de vegetales. Plato de 9 pulgadas



Diabetes Education
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How nutrients affect blood sugar



Diabetes Education
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Carbs affect Post meal Blood Glucose

- Starch
- Fruit
- Milk
- Desserts

Starchy foods



ADAM.



Diabetes Education
SERVICES

Carbohydrate Needs for Most Adults

| | Grams | Servings |
|-----------|----------|----------|
| Each Meal | 45-60 gm | 3 - 4 |
| Snacks | 15-30 gm | 1- 2 |



Carbs affect Post Meal Blood Glucose
Not for exam, just a framework
RDA – at least 130 gms of Carb a day



Diabetes Education
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Diabetes Exchange List

The Diabetic Exchange List

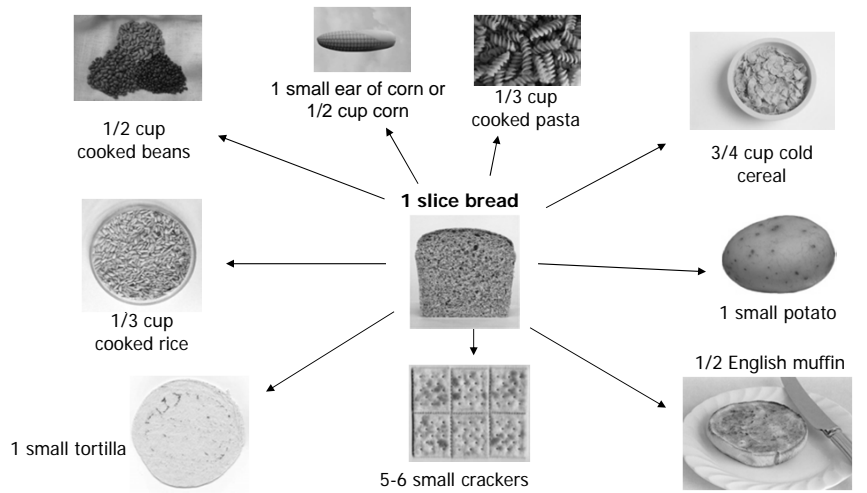
| | Carbohydrate (grams) | Protein (grams) | Fat (grams) | Calories |
|------------------------|----------------------|-----------------|-------------|----------|
| I. Starch/Bread | 15 | 3 | trace | 80 |
| II. Meat | | | | |
| Very Lean | - | 7 | 0-1 | 35 |
| Lean | - | 7 | 3 | 55 |
| Medium-Fat | - | 7 | 5 | 75 |
| High-Fat | - | 7 | 8 | 100 |
| III. Vegetable | 5 | 2 | - | 25 |
| IV. Fruit | 15 | - | - | 60 |
| V. Milk | | | | |
| Skim | 12 | 8 | 0-3 | 90 |
| Low-fat | 12 | 8 | 5 | 120 |
| Whole | 12 | 8 | 8 | 150 |
| VI. Fat | - | - | 5 | 45 |



Diabetes Education
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Carb Counting - Starch

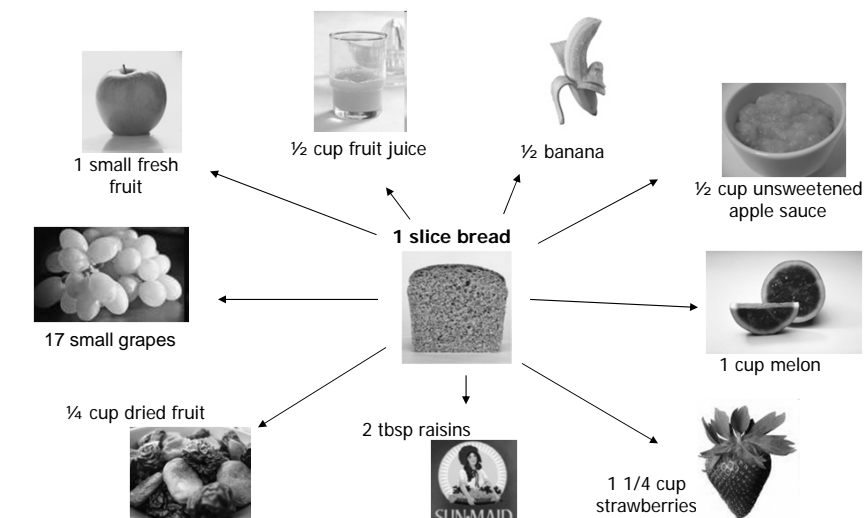
Each Food has:
80 Calories
15 grams carb



Diabetes Education SERVICES

Carb counting- fruit

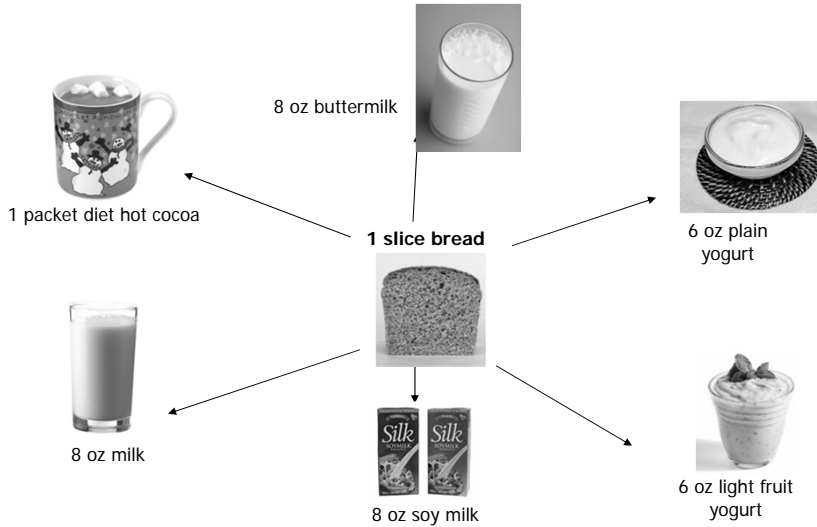
Each Food has:
60 Calories
15 grams carb



Diabetes Education SERVICES

Carb Counting - Milk

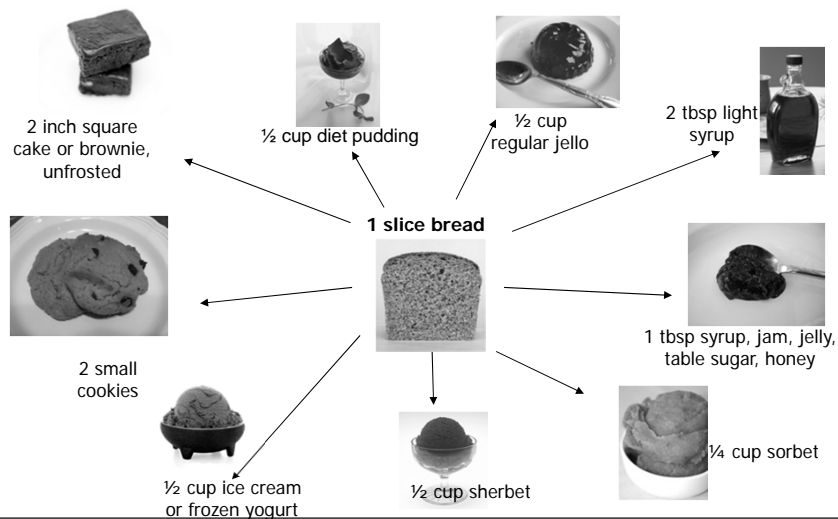
Each Food has:
90-150 calories
12-15 grams carb



Diabetes Education SERVICES

Carb Counting - Sweets

Each Food has:
Calories vary
15 grams carb



Diabetes Education SERVICES

Choose Healthy Carbs

- o Carbs have fiber, vitamins, minerals and phytonutrients
- o 25 gms of fiber a day
- o Power Carbs include:
 - o Beans
 - o Veggies
 - o Fruits
 - o Whole grain foods



Diabetes Education
SERVICES

10 Superfoods

- ▶ Beans
- ▶ Dark Green Leafy Veggies
- ▶ Citrus Fruit
- ▶ Sweet Potatoes
- ▶ Berries
- ▶ Tomatoes
- ▶ Fish High in Omega-3 Fatty Acids
- ▶ Whole Grains
- ▶ Nuts
- ▶ Fat-Free Milk and Yogurt



Diabetes Education
SERVICES

Nutrition Facts

Serving Size 1/2 cup (114 g)
Servings Per Container 4

Amount Per Serving

Calories 90 Calories from Fat 30

% Daily Value*


| | |
|---|-----|
| Total Fat 3g | 5% |
| Saturated Fat 0g | 0% |
| Cholesterol 0g | 0% |
| Sodium 300mg | 13% |
| Total Carbohydrate 13g | 4% |
| Dietary Fiber 3g | 12% |
| Sugars 3g | |
| Protein 3g | |
| Vitamin A 80% * Vitamin C 60% | |
| Calcium 4% * Iron 4% | |

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

| | Calories | 2000 | 2500 |
|--------------------|-----------|--------|--------|
| Total Fat | Less than | 65g | 80g |
| Sat Fat | Less than | 20g | 25g |
| Cholesterol | Less than | 300mg | 300mg |
| Sodium | Less than | 2400mg | 2400mg |
| Total Carbohydrate | | 300g | 375g |
| Fiber | | 25g | 30g |

1 tsp sugar ⇒
=4 gms

Fooducate App – gives grade and nutrition info.



Calories per gram: Fat 9 Carbohydrates 4 Protein 4

Diabetes Education SERVICES

Fat – From ADA 2014 Standards

- ▶ Evidence is inconclusive for ideal amount of total fat intake for people with diabetes;
 - ▶ goals should be individualized;
 - ▶ fat quality appears to be far more important than quantity.
- ▶ The amount of dietary saturated fat, cholesterol, and trans fat recommended the same as recommended for general population



Diabetes Education SERVICES

Dietary Fat and Cholesterol Guidelines

- ▶ People with diabetes on avg, get 45% of calories from carbs and 30-40% from fat, 16-18% from protein
- ▶ Guidelines from ADA
 - ▶ Limit saturated fats to >10% of calories
 - ▶ Limit trans fat as much as possible
 - ▶ Limit total dietary cholesterol to 300 mg/day



Diabetes Education
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Fats- 9 calories per gram

- ▶ **Monounsaturated - healthy**
 - Olive & canola oils, Nuts, Avocado
 - Lowers total cholesterol and LDL
 - Raise HDL, high in omega 3 fatty acids

- ▶ **Polyunsaturated - healthy**
 - corn, walnut, safflower, soybean
 - Lowers total cholesterol and LDL

- ▶ **Saturated fats (unhealthy)**
 - Animal products – meat, chicken, pork, fish, skin, cheese butter, dairy
 - Plant products include; palm, coconut, palm kernel oil
 - Solid at room temp

Serving sizes

- 1 tsp butter, margarine, oil, mayonnaise
- 1 Tbsp salad dressing, cream cheese, seeds
- 2 Tbsp avocado, cream, sour cream
- 1 slice bacon



Diabetes Education
SERVICES

Unhealthy Dietary Fats

- ▶ Trans Fat – strong link between diet high in trans fat and heart disease
 - ▶ Lowers HDL
 - ▶ Increases LDL
 - ▶ May increase wt gain and abdominal fat
 - ▶ May contribute to type 2 diabetes
- ▶ Look on label and look for words “hydrogenated” or “partially hydrogenated”.



Diabetes Education
SERVICES

Protein Recommendations -2014

- ▶ For people with diabetes and no diabetes kidney disease, evidence is inconclusive for ideal amount of protein; there fore, goals should be individualized.
- ▶ RDA – 0.8gm good quality protein/kg/day
 - ▶ Protein seems to stimulate insulin response, do not use to treat hypoglycemia
 - ▶ For those with kidney failure, reducing the amount of dietary protein is not recommended. Does not improve outcomes.



Diabetes Education
SERVICES

Protein – 4 cal per gram



- Choose lean protein
 - Poultry, fish, egg, lean beef
 - Plant sources- beans, lentils, nuts
 - Low fat cheese- cottage cheese, mozzarella cheese
- Limit high fat protein
 - Bacon & sausage
 - High fat cuts of beef
 - Whole milk cheese
- Serving size
 - 1 oz = ¼ cup
 - 3 oz = deck of cards



Diabetes Education
SERVICES

Nutrition Guidelines Continued

- ▶ Alcohol amount precautions
- ▶ Weight management
- ▶ Gastroparesis, celiac disease, bariatric surgery



Diabetes Education
SERVICES

Using Alcohol Safely

- ▶ Women- 1 or fewer alcoholic drinks a day
- ▶ Men 2 or fewer alcoholic drinks a day
 - ▶ 1 alcoholic drink equals
 - ▶ 12 oz beer, 5 oz glass of wine, or 1.5 oz distilled spirits (vodka, gin etc)
- ▶ If drink, limit amount and drink w/ food.
- ▶ Can cause hypo and worsen neuropathy



Diabetes Education
SERVICES

Successful weight loss strategies include

- ▶ Weekly self-weighing
- ▶ Eat breakfast
- ▶ Reduce fast food intake.
- ▶ Decrease portion size
- ▶ Increase physical activity
- ▶ Use meal replacements
- ▶ Eat healthy foods



Diabetes Education
SERVICES

Losing 2-8kg Early in diagnosis Type 2 Helpful

ADA 2014

- ▶ Weight Loss –
 - ▶ *The optimal macronutrient intake to lose weight not known*
 - ▶ *The literature does not support one particular nutrition therapy to reduce weight, but rather a spectrum of eating patterns that result in reduced energy intake.*

- ▶ To lose one pound – avoid 3,500 cal
 - ▶ Decrease intake 250-500 cal daily + exercise



Diabetes Education
SERVICES

Bariatric Surgery

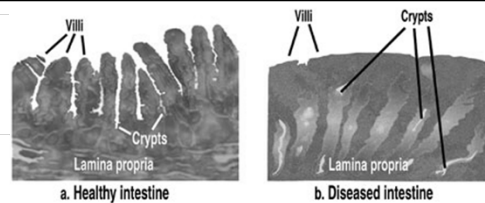
- ▶ Consider for adults with BMI 35 or greater
- ▶ Increases gut hormone availability
- ▶ Need life long support and monitoring
- ▶ More likely to cause remission* with recently diagnosed diabetes (more beta cell mass)
 - ▶ 68% remission within 5 years
 - ▶ 35% redeveloped diabetes
- ▶ Long term benefits still under investigation

*remission = BG levels normal without meds



Diabetes Education
SERVICES

Celiac Disease



- ▶ Type 1 – Affects ~10 \%
- ▶ Immune reaction to gluten - affects function of villi in intestine, decreasing nutrient absorption
- ▶ S/S: bloating, malabsorption, wt loss, fatty stools, diarrhea, muscle tenderness, failure to thrive
- ▶ Diagnosis: measure either anti-endomysial antibodies (EMA) titers or tissue transglutaminase.
- ▶ If positive, refer to GI specialist for endoscopy and biopsy of small intestine to confirm diagnosis.



Diabetes Education
SERVICES

Treatment – Gluten Free for Life



- ▶ Avoid
 - ▶ Wheat (einkorn, durum, faro, graham, kamut, semolina, spelt),
 - ▶ Rye
 - ▶ Barley
- ▶ Refer to a dietitian

ASSOCIATED AUTOIMMUNE DISORDERS

- ▶ Insulin-dependent Type 1 Diabetes Mellitus, Liver diseases, Thyroid Disease-Hashimoto's Thyroiditis, Lupus (SLE), Addison's Disease, Chronic Active Hepatitis, Rheumatoid Arthritis



Diabetes Education
SERVICES

Ex of Gluten Containing Foods

- Brown rice syrup
 - Breeding & coating mixes
 - Croutons
 - Energy Bars
 - Flour or cereal products
 - Imitation bacon
 - Imitation seafood
 - Marinades
 - Pastas
 - Processed luncheon meats
 - Sauces, gravies
 - Self-basting poultry
 - Soy sauce or soy sauce solids
 - Soup bases
 - Stuffings, dressing
 - Thickeners (Roux)
 - Communion wafers
- And more!



Diabetes Education
SERVICES

Celiac Disease Resources

- ▶ Celiac Association www.csaceliacs.org
- ▶ Gluten intolerance group www.gluten.net
- ▶ Gluten-Free Mall www.glutenfreemall.com
- ▶ Celiac.org
- ▶ Gluten Free Diet: A Comprehensive Resource Guide – Shelley Case
- ▶ New laws to mandate standardized labeling for “gluten free”



Diabetes Education
SERVICES

Gastroparesis



- ▶ Gastroparesis: affects 20 – 30% of pt's w/ longstanding dm
- ▶ Delayed emptying of stomach contents due to nerve damage
- ▶ S/S include early satiety, fullness, postprandial hypo, vomiting
- ▶ Diagnosis: gastric emptying studies, post-prandial hypoglycemia
- ▶ Tx: improve BG, small, low fat & fiber meals meds: reglan, erythromycin



Diabetes Education
SERVICES

Disordered Eating

- ▶ “DiaBulimia”
- ▶ People with type 1 diabetes give themselves less insulin than needed to lose weight
- ▶ Tends to start in adolescence, more likely to occur in women than men.
- ▶ Signs: unexplainable spikes, A1c, weight loss, lack of marks from fingerpricks, lack of prescription refills for diabetes meds, records that don't match A1c.
- ▶ Treatment – Mental health specialist and team



Diabetes Education
SERVICES

Know these Facts

- ▶ Fat - 9 cal per gm
- ▶ Carb – 4 cal per gm
- ▶ Protein – 4 cal per gm
- ▶ Common food carb count
- ▶ Milk is 12 gms of carb
- ▶ 1 lb = 3,500 cal
- ▶ 10,000 steps recommended a day
- ▶ 2000 steps – 1 mile



Diabetes Education
SERVICES

Physical Activity – Key areas

- ▶ ADA and American College of Sports Medicine recommendations
- ▶ Benefits, barriers precautions
- ▶ Exercise and activity plan (aerobic, resistance training, etc)
- ▶ Adjustment and monitoring of food and/or meds



Diabetes Education
SERVICES

Physical Activity - ADA

- ▶ Children with diabetes or diabetes should be encouraged to engage in at least 60 minutes of physical activity a day
- ▶ Adults with diabetes –
 - ▶ 150 minutes a week of moderate-intensity aerobic physical activity
 - ▶ spread over at least 3 days/wk
 - ▶ Don't miss more than 2 consecutive days of exercise.
- ▶ In absence of contraindications, type 2 adults should engage in resistance training 2x's a wk



Diabetes Education
SERVICES

Definitions

- ▶ Physical activity
 - ▶ Bodily movement produced by the contraction of skeletal muscle that requires more energy than when resting
- ▶ Exercise
 - ▶ Subset of physical activity that is planned, structured and includes repetitive body movements
 - ▶ Performed to improve or maintain physical fitness
- ▶ Sedentary behavior
 - ▶ Little on no movement or physical activity



Diabetes Education
SERVICES

Benefits of Exercise

- ▶ Improve BG
 - ▶ Improves insulin sensitivity
- ▶ Reduce CV Risk factors
- ▶ Maintain wt loss
- ▶ Contribute to well being
- ▶ Muscle strength
- ▶ Slows decline in mobility



Diabetes Education
SERVICES

Importance of Exercise with Diabetes

- ▶ Vital component of prevention as well of the management of type 2 diabetes
- ▶ Greatest impact in improving metabolic abnormalities in type 2 when started early in progression from IR to Pre Diabetes to DM
- ▶ Type 1 – emphasis on adjusting insulin to allow for safe participation in all forms of activity.



Diabetes Education
SERVICES

Progressive Resistance exercise

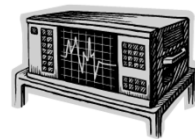
- ▶ Improves insulin sensitivity
- ▶ Goal is 2 sessions a week
- ▶ Examples include:
 - ▶ Exercise with free weights, wt machines
- ▶ Each session consisting of least:
 - ▶ One set of five or more resistance exercises using large muscle groups



Diabetes Education
SERVICES

Pre-exercise evaluation T2

- ▶ In asymptomatic pts, routine screening for CAD is not recommended.
 - ▶ Does not improve outcome as long as CVD risk factors are treated.
- ▶ Assess CV risk factors annually
 - ▶ Dyslipidemia, HTN, smoking, positive family history of premature coronary disease, and + albuminuria
- ▶ Candidates for advanced or invasive cardiac testing include:
 - ▶ Typical or atypical cardiac symptoms
 - ▶ Abnormal resting ECG



Diabetes Education
SERVICES

Pre-exercise Eval

- ▶ Use clinical judgment when making physical activity suggestions and check in with provider if unsure.
- ▶ Encourage high risk pts to start with low intensity and short time.
 - ▶ Increase duration and intensity slowly
- ▶ Contraindications to certain types of exercise:
 - ▶ Uncontrolled HTN, severe autonomic or peripheral neuropathy, history of foot lesions, unstable proliferative retinopathy.
 - ▶ Pt w/ complications require a more thorough assessment.



Diabetes Education
SERVICES

When to Consider Stress Testing

Reviews/Commentaries/ADA Statements

Exercise and Type 2 Diabetes

The American College of Sports Medicine and the American Diabetes Association: joint position statement

SHERI R. COLBERG, PhD, FACSM¹
RONALD J. SIGAL, MD, MPH, FRCP(C)²
BO FERNANDEZ, PhD, FACSM³
JUDITH G. REGENSTEINER, PhD⁴
BRYAN J. BISSMER, PhD⁵

RICHARD R. RUBIN, PhD⁶
LISA CHASANI-TABER, ScD, FACSM⁷
ANN L. ALBRECHT, PhD, RD⁸
BARRY BRAUN, PhD, FACSM⁹

disease (CVD), blindness, kidney nerve disease, and amputation (though regular physical activity) prevent or delay diabetes and its complications (10.46,89,112,176,208); most people with type 2 diabetes



In general, electrocardiogram (ECG) stress testing may be indicated for individuals matching one or more of these criteria:

- Age >40 years, with or without CVD risk factors other than diabetes
- Age >30 years and
 - Type 1 or type 2 diabetes of >10 years in duration
 - Hypertension
 - Cigarette smoking
 - Dyslipidemia
 - Proliferative or preproliferative retinopathy
 - Nephropathy including microalbuminuria
- Any of the following, regardless of age
 - Known or suspected CAD, cerebrovascular disease, and/or peripheral artery disease (PAD)
 - Autonomic neuropathy
 - Advanced nephropathy with renal failure



Diabetes Education
SERVICES

Patients to discuss symptoms with provider before starting exercise

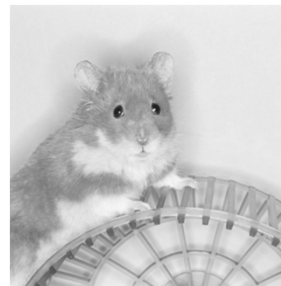
- ▶ Chest pain and/or shortness of breath
- ▶ Leg cramps that go away with rest
- ▶ Head, shoulder, neck and or back aches.
- ▶ *Any unexplained pain above the belt line should be considered cardiac in origin until proven otherwise.*



Diabetes Education
SERVICES

Exercise effects on BG – No Diabetes

- ▶ Insulin action suppressed
- ▶ Counter regulatory hormones
 - ▶ Release stored glycogen from muscle and liver
 - ▶ Increase gluconeogenesis
- ▶ To replace glycogen stores
 - ▶ Glucose uptake continues for up to 48 hours

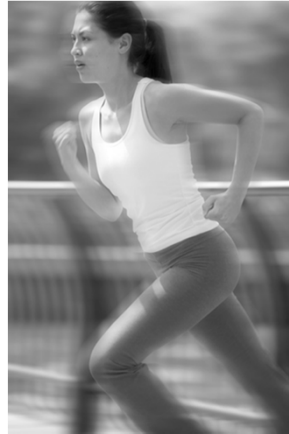


Diabetes Education
SERVICES

Hormone Response –Type 1

- ▶ Exogenous insulin remains high
- ▶ Increased insulin sensitivity
- ▶ Increased insulin absorption

What is this group at risk for?
What strategies to stay safe
before, during and after
exercise?



Diabetes Education
SERVICES

Hormone Response –Type 2

- ▶ Decreased secretion of
endogenous insulin
- ▶ Increased insulin sensitivity
- ▶ Increased glucose disposal



What is this group at risk for?
What strategies to stay safe
before, during and after
exercise?



Diabetes Education
SERVICES

Hypoglycemic Risk

▶ Type 1

- ▶ Activity increases exogenous insulin sensitivity and may block glycogenolysis



▶ Type 2

- ▶ Same concern as above is on insulin and sulfonylureas
- ▶ Low risk if treated by diet, exercise or medications that do not cause hypoglycemia.



Diabetes Education
SERVICES

Duration of Hypoglycemia Risk

- ▶ During exercise
- ▶ Immediately after exercise
- ▶ Post exercise late onset hypo
 - ▶ More often in type 1
 - ▶ More often at night
 - ▶ Moderate to high intensity exercise > 30 min
 - ▶ 4 to 15 hours following an exercise session



Diabetes Education
SERVICES

Hypoglycemia Prevention Strategies

- ▶ If planned activity, adjust insulin in anticipation of activities
- ▶ Reduce insulin in post exercise period
- ▶ Frequent monitoring in post exercise period
- ▶ Pt to keep log to determine how responds to different activities, duration and intensity.



Diabetes Education
SERVICES

Hypoglycemia Prevention Strategies

- ▶ Carry fast acting carb/ glucagon ER Kit
- ▶ Extra CHO in post exercise period
- ▶ Caution with alcohol post exercise
- ▶ Adjust carbohydrate prior to planned activity:
 - ▶ 15 gms carb snack
 - ▶ If using insulin and /or secretagogues
 - ▶ BG < 100 prior to exercise



Diabetes Education
SERVICES

Hypoglycemia Prevention

CARBOHYDRATE REPLACEMENT DURING PHYSICAL ACTIVITY

| Intensity | Duration | Carbohydrate Replacement | Frequency |
|------------------|------------------|--------------------------|-----------|
| Mild to Moderate | <30 min | May not be needed | N/A |
| Moderate | 30 to 60 minutes | 15 grams | Each hour |
| High | >60 min | 30 to 50 grams | Each hour |



Diabetes&Nutrition
Support Services



Diabetes Education
SERVICES

What about hyperglycemia risk?

- ▶ Type 1 – Yes
 - ▶ Due to too little insulin on board and excessive stress hormones
- ▶ Problem solving
 - ▶ Inadequate insulin
 - ▶ High intensity exercise
 - ▶ Competitive sports



Diabetes Education
SERVICES

Ketone Testing

- ▶ Type 1 – BG > 240 mg/dl
- ▶ Type 2 – BG > 300 mg/d



- ▶ Positive ketones
 - ▶ Exercise recommended
 - ▶ Can worsen hyperglycemia and ketosis
- ▶ Negative ketones
 - ▶ Not necessary to postpone exercise if pt feels well and is adequately hydrated

| Results / Ergebnisse | | | | | | | |
|----------------------|----------|-------|--------|---|----|-----|------|
| GLUCOSE | NEGATIVE | TRACE | SUBLEN | * | ** | *** | **** |
| GLUCOSE | GLUCOSE | | | | | | |
| KETONE | NEGATIVE | TRACE | SUBLEN | * | ** | *** | **** |
| KETONE | KETONE | | | | | | |



Diabetes Education
SERVICES

Behavior Change and Smart Goals



Diabetes Education
SERVICES

Consider Client's View* on Health: Learning Theories and Approaches

- Pt. Empowerment
- Health belief Theory
- Social Learning Theory
- Transtheoretical Theory
(stages of change)



1. Pt. Empowerment

- 99% of dm care is self-care
- Responsibility rests on the person w/ dm
- Pt -experts in own life (HCP- experts in clinical aspects)
- Posits: self goals, freely chosen- more successful, longer; self responsibility.



Steps to Facilitate Empowerment

- **step by step approach**
- **focus on behaviors, not outcomes**
- **use contracts/or not**
- **involve family/other people important to the patient**

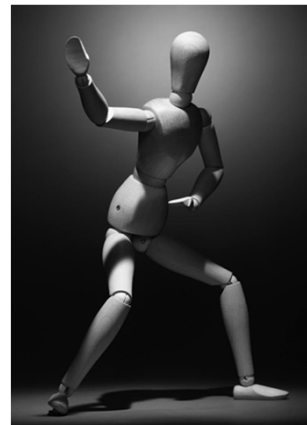


Diabetes Education
SERVICES

2. Health Belief Model

Their Belief Matters!!

- **Behavior influenced by 4 perceptions**
 - **susceptibility** – vulnerability to negative consequences
 - **severity** of perceived consequences?
 - **benefits** of self-care?
 - **costs** of self-care?



Diabetes Education
SERVICES

3. Social Learning Theory

■ Pts learn from own AND observing “others” behaviors and consequences.

- Interaction, behavior, environment
- Environment
- Behavioral capability
- **Observational Learning**
- Reinforcement, Self Confidence

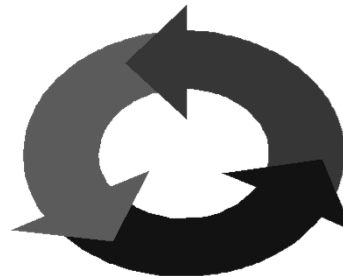


Diabetes Education
SERVICES

4. Transtheoretical Model

■ Stages of Change (Behavior Change Process)

1. Precontemplation
2. Contemplation
3. Preparation
4. Action
5. Maintenance
6. Termination (relapse, recycle)



Diabetes Education
SERVICES

Transtheoretical Theory

- “Readiness” Level determines the approach!
- Patients pass through similar stages as they prepare for change (eating better, decreasing drinking)
- Simplified version of the Stages of Change:
 - Not ready -no intentions.
 - Unsure: Ambivalent
 - Ready: Committed, just needs to know HOW!



Diabetes Education
SERVICES

Setting Goals

- ▶ Specific
- ▶ Measurable
- ▶ Attainable
- ▶ Realistic
- ▶ Timely
- ▶ Learning Objective—
Describe portion size for 3 favorite types of carbohydrate.
- ▶ Behavioral Goal – Count and document carb intake at each meal for 2 weeks.



Diabetes Education
SERVICES

You are going to do Great!

- ▶ Know how to get to testing site
- ▶ Get a good nights sleep
- ▶ Stand and move around during test
- ▶ Put your hands on your hips.
- ▶ Afterward:
- ▶ Celebrate – treat yourself
- ▶ Jot down your impressions
- ▶ Email us so we can pass it on
- ▶ When you pass, send us your photo to post!



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Thank You



- ▶ Questions?
- ▶ Email
bev@diabetesed.net
- ▶ Web
www.diabetesed.net

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